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METHOD OF FORMING THE RANGE OF ACCEPTABLE PRICES FOR A NEW PRODUCT (USING SOFTWARE PRODUCTS AS AN EXAMPLE)

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摘要：本文识别并系统化了商品消费者质量的主要指标，列举了先前提出的用于定量评估指标值的算法，这些指标值以某种方式表征了新产品的竞争优势。本文提出了一种新颖的确定新产品潜在购买者可接受价格区间的方法。该方法首次利用样本的十分位距来提高评估价格区间边界和专家响应分布统计特征的准确性。最后给出了该方法的数值示例。

关键词：消费者质量，定量评估，可接受价格，价格区间，评估准确性，竞争优势，十分位距，统计特征，分布。

Abstract. *The main indicators of consumer quality of goods are identified and systematized, previously proposed algorithms for quantitative assessment of the values of indicators, in one way or another characterizing the competitive advantages of a new product, are listed. An original method for determining the acceptable price range for a new product for a potential buyer is proposed. In the method, the interdecile range of the sample is used for the first time to improve the accuracy of assessing the boundaries of the price range and the statistical characteristics of the distribution of expert responses. A numerical example of using the method is given.*

Keywords: *consumer quality, quantitative assessments, acceptable price, price range, accuracy of assessment, competitive advantages, interdecile range, statistical characteristics, distribution.*

Introduction. It turns out that setting the price for a new product correctly is not at all easy. After all, in the world a huge number of newly created enterprises offering on domestic and foreign markets new products designed and manufactured by them, including resource-intensive and structurally complex products, go bankrupt in the first years of their “life”, and, as a result, the owners of the enterprise suffer financial losses and a decrease in revenues to the state budget.

Of course, there are many objective reasons for the lack of demand for any new product. Obviously, the lower limit of the price is the cost of the new product. However, the operation of an enterprise without profit can continue only for a very limited time. Therefore, such a value of the lower limit of the price is undesirable, or rather, unacceptable. But how to determine the value of the upper limit of the price of a new product, exceeding which practically guarantees bankruptcy of the enterprise? And how to quickly and correctly determine the range of acceptable prices for any new product? How and with what to interest potential buyers on the domestic and / or foreign market? How to reduce the likelihood of error in assessing the lower and upper limits of the range of acceptable prices for a new product? As far as we know, there are currently no substantiated recommendations for choosing a range of acceptable prices for new products for a specific administrative-territorial entity (ATO) or a specific country, including resource-intensive and structurally complex products - CNC machines, DBMS, application software packages, electronic digital platforms for managing groups of unmanned objects, ...

Based on the results of previously completed studies, the article systematizes the main indicators of consumer quality of goods and specifies algorithms for their quantitative assessment, proposes a methodology containing a list of original actions aimed at assessing the range of acceptable prices for new products for sale in a specific administrative-territorial entity or a specific country.

1. How to ensure demand for a new product. It is known that each new product, in order to ensure sustainable demand that allows making a profit, must have such competitive advantages that can interest some, preferably large groups of potential buyers. But if there are no such advantages, then it is very difficult, almost impossible for a new product to win the competitive struggle. Moreover, the desire to manufacture and introduce to the domestic market of a new product that does not have obvious, quantitatively measurable competitive advantages over the product already presented on the market is, in fact, an irreparable loss for the country, a waste of always limited intellectual, material, labor, energy and financial resources spent on the design, production and distribution (organization of sales) of a new product. A typical example of errors of this kind is a situation that took place in the recent past, when a large number of complex and expensive software products (SP) of one purpose were presented on the domestic market, but with a reliably unknown composition and significance (information “weight”) of functions, with unknown user time costs for performing each function, with an unknown total cost of ownership, with unknown results of a comparative assessment of interface options and with many missing values of other indicators characterizing consumer quality and competitive market positions of the SP. After all, the fact that the volume of SP exports in some countries of the world reaches tens and hundreds of

billions of dollars indicates the undeniable competitive advantages of the goods exported by these countries.

2. On the assessment of consumer quality and competitive advantages of a new product. It was previously determined (see paragraph 1) that a new product, in order to ensure stable demand, must have a higher comparative consumer quality and reliably assessed competitive advantages. But what is the composition of the consumer properties of such a product? And is it possible to quantitatively assess the consumer quality indicators of a new product? Here, the main indicators of consumer quality of a product are systematized and the previously proposed algorithms for the quantitative assessment of the values of the indicators, in one composition or another characterizing the competitive advantages of a new product, are listed. And in order to improve the consumer quality of a new product, it is only necessary to improve these indicators, achieving comparative competitive advantages of the product. For example, *by reducing the time and other resource costs for performing the same functions as competitors, or by creating new useful functions, or by achieving an improvement in some important, very useful characteristics of the new product - speed, height, cost, survivability, total cost of ownership (TCO), etc. 2.1. Comparative assessment of the resource intensity of a new product. It is possible to quantitatively evaluate, compare and make an optimal choice based on the criterion of minimum resource costs (time, labor, material, energy and/or financial resources) for the implementation of *processes of design, production and application (use) of new products for various purposes using the information presented in [1-5].

Obviously, the lower the resource intensity of products, the lower, in general, both the cost price and the price of the product, and, accordingly, the stronger and more stable the competitive market position of the company that has offered products with minimal resource intensity to the market. Moreover, reserves for reducing the resource intensity of new products can be found at each stage of the product life cycle - both at the design stage and at the stage of operation or maintenance.

Examples of the application of the process-statistical method of accounting for resource costs are also given in a number of other works [6 7].

2.2. Comparative assessment of the functional completeness, interrelation and significance (information "weight") of new products and their functions. It is known that with the development of scientific and technological progress, the number of functions implemented by most products also increases. And new functions can be extremely useful for a potential buyer, and a seller who has added a new function to his product will be able to increase the price of this product, making the price quasi-monopoly. Therefore, one of the advantages of a newly created product will be the optimization of the composition of its functions with

an assessment of the significance (information “weight”) of both the product and its functions.

Almost every subject area has to solve problems related to the quantitative comparative assessment and optimization of the composition of the characteristics of various products. However, this is very difficult to do. Firstly, because many market products have hundreds and thousands of characteristics (functions) implemented by them. Thus, the number of software product (SP) functions for document flow automation has exceeded 500 (Evgeny V. Pakhomov), the number of PP functions for accounting automation in budgetary organizations is 900 (Svetlana N. Shirobokova). Secondly, the number of modifications of goods of the same purpose is also growing. However, at the same time, a number of other problems arise. For example, how can a consumer or customer find the right product with certain characteristics among many comparable and often competing goods? How can goods be classified by the composition of their characteristics-functions? How can a complete list of characteristics possessed by all analyzed goods be formed? How can the information weight of each characteristic-function and the degree of conformity of the analyzed new structurally complex goods with the requirements of the upper-level system be quantitatively assessed?

The method of comparative quantitative assessment of the functional completeness, interrelation and significance of objects and their characteristics [8-10] allows answering the listed questions. The method is based on original algorithms using operations with sets: intersection, difference, union, ratio and Jacquard similarity measure, and for a visual representation of the interrelations between objects by the selected features, graphs constructed by logical inclusion (absorption) matrices and by Jacquard similarity matrices are used.

2.3. Comparative assessment of external appearance options for a new product (software interface options). This task seems to be very relevant. After all, judging by the literature, a successful choice of an interface option helps to understand the features of the software operation, partially supplementing the User Manual. For the vast majority of buyers, the task of comparative assessment and selection of an object design option is extremely relevant - an interface option for a software product, an external appearance option for a car body, etc. In [11], correct procedures are proposed that focus on the step-by-step use of the Kemeny distance and median and nonparametric statistical methods when comparing software product interface options and the appearance of any artistically designed object (see also [12-14]).

2.4. Comparative assessment of the total cost of ownership of a new durable product (TCO). Most software systems (software products, information systems) are also classified as durable products. The concept of IT costs includes costs associated with the acquisition, implementation, and use of software. These

costs form the total cost of ownership of the software system (TCO), which includes initial and subsequent costs, defining them as uniform costs for the software system in the process of its creation and operation (see [15]):

2.5. Comparative assessment of time costs for mastering the User Manual for a new product. The task of determining the time spent on the actual mastering of new material is extremely relevant for all sectors of social production and science - after all, in the conditions of continuous acceleration of scientific and technological progress, each person is forced to study throughout their entire conscious life.

In [16], a universal method for assessing the time spent on acquiring knowledge is proposed, including methods and tools for calculating the statistical characteristics of the distribution of the time spent mastering any educational material under various conditions of forming the initial information: in the process of questioning students, according to the data of natural experiments and according to the results of expert surveys. Statistical characteristics of time costs (mathematical expectation, dispersion, variation coefficient, excess, asymmetry) and distribution (in the form of tables and histograms) are estimated by means of simulation modeling. Based on the results of simulation modeling, it is easy to determine the confidence limits for a specific value of the time spent on studying the User's Guide.

2.6. Comparative assessment of the user's time spent on performing the functions of a new product. The spread of time spent on performing the same functions when using different software products can be very significant. And if the function must be performed repeatedly during a shift, then in this case such a situation can significantly affect labor productivity (see, for example, [17]).

2.7. Comparative assessment of the level of protection of intellectual property contained in the new product - the level of protection of the software from copying. For this purpose, you can use the recommendations presented in [18, 19].

The composition of the main indicators of consumer quality of new resource-intensive and structurally complex products should be supplemented by the following:

2.8. Comparative assessment of the level of working conditions of the personnel servicing the new resource-intensive and structurally complex products [20, pp. 163-200].

3. Establishing an acceptable price range for a new product for a potential buyer. After the new product has received high values of consumer quality indicators (see paragraph 2) and real competitive advantages, it is necessary to determine an acceptable price for the new product for potential buyers.

For this purpose, a population survey is usually conducted regarding the price that the surveyed citizens-potential buyers are willing to pay for a new product. However, this approach raises many problems that violate the reliability of the

results obtained. This is due to the fact that most countries have administrative-territorial entities with different population sizes, different per capita incomes, different specializations of economic activity, different development budgets and different capacities of enterprises and, most importantly, with different financial capabilities of potential buyers, citizens and enterprises. It turns out that acceptable prices for a new product in different ATOs and different countries can differ quite significantly.

Another problem is that the type of distributions obtained in the process of surveying acceptable price values is unknown, the number of survey participants in each sample is different, and the mathematical expectations, dispersions and variation coefficients are also different in each sample. Therefore, the values of the boundaries of the ranges of acceptable prices for a new product will also be different. And there may be very few people in each sample who are really interested in buying a new product, and, unfortunately, there are quite a few who just want to play pranks and have fun.

In the method we propose, an attempt was made to exclude the negative impact of the above and other problems on the reliability of the assessment of the price of a new product acceptable to citizens of a particular ATO. Let us point out the main features of the method.

Firstly, the medians of the distributions were used as the most probable price value, since "by virtue of Theorem II, with a completely unknown value that can greatly deviate from the normal distribution law, it is more reliable to use the median method" (see [21, p. 112]).

Secondly, it is possible to significantly increase the accuracy of assessing the boundaries of the range of prices for a new product acceptable to potential buyers by using the interdecile range of samples, which, as is known, allows one to practically stabilize the values of statistical characteristics even with an unknown general distribution. Thirdly, the fact that the methodology is focused on the use of a strict, but justified from the point of view of the economic security of the state requirement, the essence of which is that each new product must have high values of consumer quality indicators and easily confirmed competitive advantages (see paragraph 2).

The proposed methodology includes the following steps:

Step 1. Informing the population of a specific administrative-territorial entity (ATO) about a new product, indicating all its competitive advantages and high values of consumer quality indicators (it is possible to use the media, social networks and/or the website of the enterprise developing the new product)

[Note. 3.1. After informing the population of a specific ATO about the high values of consumer quality indicators and, accordingly, the obvious competitive advantages of the new product, the number of individuals and legal entities who

are really interested in buying the new product will increase and, conversely, *the number of those who are not going to buy the new product, considering the survey about an acceptable price to be just a game, will decrease.]

Step 2. Inviting citizens of a specific ATO, potential buyers of the new product, to participate in the survey regarding the price of the new product that is acceptable for each of the respondents,

Step 3. All respondents are informed that each of those participating in the survey will be able to buy this new product at the price they indicated during the survey if it turns out that the price they indicated fell within the interdecile range I80, which includes 80% of the entire sample distribution, i.e. only those who indicated a price that fell within the 10% lowest prices and those who fell within the 10% highest prices are excluded from the list of priority buyers. Accordingly, the median of the distribution - $DZ_{5.}$, and interdecile range

$$I_{80} = DZ_9 - DZ_1.$$

[Note 3.2. For the first time, citizens of each ATO participating in the survey, due to the inclusion of game elements in the proposed methodology (whether the answer about the price will fall into the required decile or not - after all, depending on the result of the hit, the purchase price may differ very significantly) have the opportunity to buy a new product for the price they indicated with 80% probability (with a probability of 0.8)!]

Step 4. After completing the survey of potential buyers regarding the price of the new product acceptable to them, all participants are informed

*about the nature of the distribution of the sample of acceptable prices for the new product (histograms and distribution tables are shown)

*about the statistical characteristics of the distribution of prices for the new product acceptable to individuals and legal entities participating in the survey.

*about the range of acceptable prices that fell into the interdecile range of the sample, i.e. into the 80% range equal to $I_{80} = DZ_9 - DZ_1$

Step 5. Informing the survey participants about the numerical values of the boundaries of the range of acceptable prices for the new product.

[Note 3.3. The range of acceptable prices for a new product for potential buyers in a specific ATO has the following boundaries: the lower one - from the last value of the 1st decile to the first value of the 9th decile in the interdecile range of the sample of acceptable prices.]

Step 6. And finally, it is time to inform those survey participants whose answers regarding the acceptable price fell into the first and ninth deciles that they also have the right to buy the new product by paying a certain price that is quite acceptable for them: for those whose answers fell into the first decile, the purchase price will be equal to the last value of the first decile, and those whose answer fell into the ninth decile will be able to buy the new product at the price of the first

value of the ninth decile, i.e. at a price that is less than the one they indicated in their answers.

[Note. 3.4. Given the random nature of price dynamics in a market economy, it can be assumed that periodic surveys of potential buyers in the ATO using the proposed methodology are entirely justified.]

An example of implementing one of the method options. The initial data are presented in Table 1.

Table 1.

Results of a survey of potential buyers about the price of a new product that is acceptable to them

Administrative-territorial entities	Minimum price value	Maximum price value	The value of the median of the distribution	Share of respondents
P1	20	70	40	0,2
P2	60	180	90	0,1
P3	70	160	100	0,25
P4	50	120	80	0,05
P5	30	50	40	0,4

As a result of the simulation modeling of the initial data (Table 1), histograms of the distribution of acceptable prices of potential buyers in different ATOs (Figures 1 and 2), tables of cumulative probabilities (Table 2) and tables of comparative assessment of the statistical characteristics of the distribution of prices of a new product, obtained as a whole for the sample and for the interdecile range (Table 3) were obtained.

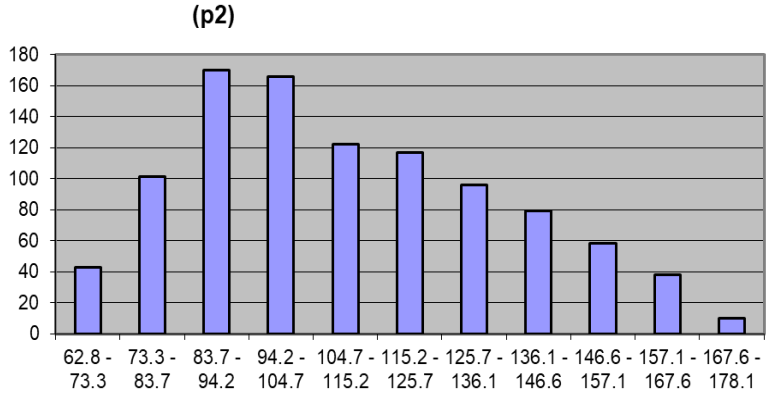

Figure 1. *Histogram of the distribution of responses of potential buyers in ATO p2 about the price of a new product that is acceptable to them*

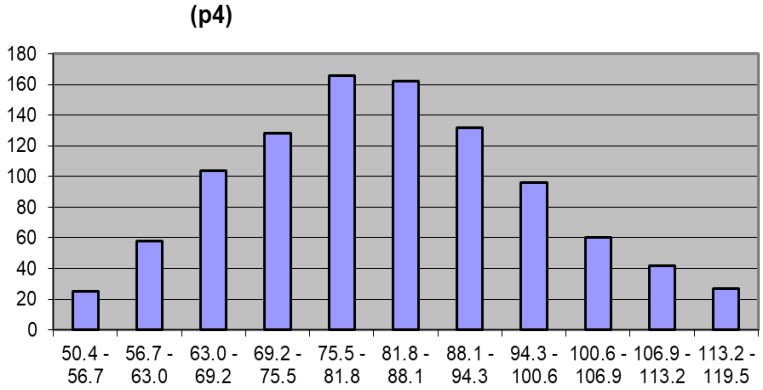

Figure 2. *Histogram of the distribution of responses from potential buyers in ATO p4 about the price of a new product acceptable to them*

Table 2.

Probability of prices of a new product acceptable to potential buyers in ATO p4 falling within a certain range of values

Range of acceptable price values		**Frequency and probability of hitting**		**Cumulative probability**
X_{min}	X_{max}	**Frequency**	**Probability**	
50.4	56.7	25	0.025	0.025
56.7	63.0	58	0.058	0.083
63.0	69.2	104	0.104	0.187
69.2	75.5	128	0.128	0.315
75.5	81.8	166	0.166	0.481
81.8	88.1	162	0.162	0.643
88.1	94.3	132	0.132	0.775
94.3	100.6	96	0.096	0.871
100.6	106.9	60	0.060	0.931
106.9	113.2	42	0.042	0.973
113.2	119.5	27	0.027	1.000

Analysis of the simulation results showed that

1) both the values of the statistical characteristics of the distribution and the histograms indicate a very significant spread of the values of prices acceptable to potential buyers in different ATOs,

2) It turned out that the type of distribution of acceptable prices also varies greatly - see Figures 1 and 2.

3) The conclusion that when focusing on the use of interdecile range, the values of statistical characteristics stabilize - the values of dispersion, standard deviation, variation coefficients and asymmetry decrease several times - see Table 3 - was fully confirmed!

4) Despite significant differences in the type of histograms of the distributions p2 and p4 obtained from samples, the values of statistical characteristics obtained from the interdecile range for p2 and p4 are almost identical.

5) As follows from the data in Table 3, the 80% interdecile range immediately indicates the limits of the range of acceptable prices for a new product: for ATO p2 – the lower 79, the upper 138, and for ATO p4 – the lower 64, the upper 102.

Table 3.

Results of a comparative assessment of the statistical characteristics of the distribution of prices for a new product, obtained as a whole for the sample and for the interdecile range

Parameters	**Values of statistical characteristics of the distribution of responses of potential buyers about the acceptable price of a new product for them**			
	ATO p2		**ATO p4**	
	By sample	**Interdecile range**	**By sample**	**Interdecile range**
Number of iterations	1000	1000	1000	1000
Mean	110	109	83	83
Variance	637	151	214	67
Standard deviation	25	12	15	8
Variation coefficient	0.23	0.11	0.18	0.1
Skewness	0.4	-0.01	0.2	-0.1
Minimum	62.8	79	51	64
Maximum	178	138	119	102

Conclusions. The article for the first time

1. Identifies and systematizes the main indicators of consumer quality of goods, lists previously proposed algorithms for quantitative assessment of the values of indicators, in one way or another characterizing the competitive advantages of a new product.

2. Proposes an original method for determining the price range for a new product acceptable to a potential buyer. In order to improve the accuracy of assessing the boundaries of the acceptable price range and statistical characteristics of the distribution of expert responses, the method uses for the first time the interdecile range of the sample.

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探索环境营销在促进区域发展中的作用：亚美尼亚和欧亚经济联盟的财务管理视角

EXPLORING THE ROLE OF ENVIRONMENTAL MARKETING IN PROMOTING REGIONAL DEVELOPMENT: FINANCIAL MANAGEMENT PERSPECTIVES IN ARMENIA AND THE EAEU

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摘要：环境营销日益成为促进可持续经济增长和区域发展的关键战略。在亚美尼亚和欧亚经济联盟（EAEU），将环境营销融入商业实践需要谨慎的财务管理和战略投资规划。本文探讨了环境营销在促进区域发展中的作用，强调了可持续发展举措与财务治理相协调的重要性。研究指出了绿色融资渠道有限、财政约束和监管差异等挑战，并提出了整合环境营销、风险管理和区域合作以促进可持续发展的解决方案。

关键词：环境营销、财务管理、亚美尼亚、欧亚经济联盟（EAEU）、可持续商业实践、风险管理。

Abstract. *Environmental marketing has increasingly become a key strategy for fostering sustainable economic growth and promoting regional development. In Armenia and the Eurasian Economic Union (EAEU), the integration of*

environmental marketing into business practices requires careful financial management and strategic investment planning. This paper examines the role of environmental marketing in promoting regional development, emphasizing the importance of aligning sustainability initiatives with financial governance. The study identifies challenges such as limited access to green financing, fiscal constraints, and regulatory differences, while proposing solutions that integrate environmental marketing, risk management, and regional cooperation to enhance sustainable development.

Keywords: *Environmental Marketing, Financial Management, Armenia, Eurasian Economic Union (EAEU), Sustainable Business Practices, Risk Management.*

Introduction. Environmental marketing refers to business strategies that emphasize eco-friendly products, sustainable production processes, and corporate social responsibility initiatives aimed at reducing negative environmental impacts (Kotler & Keller, 2022). Beyond corporate benefits, environmental marketing has broader implications for regional development, contributing to economic diversification, social welfare, and the creation of green jobs.

In Armenia and the broader EAEU context, promoting environmentally responsible business practices can enhance competitiveness and attract both local and foreign investments. However, the adoption of green marketing strategies often faces financial barriers, including high initial costs, cash-flow management challenges, and limited access to funding mechanisms. Therefore, understanding the intersection of environmental marketing and financial management is essential to design effective policies and corporate strategies that promote sustainable regional development.

Literature Review. According to Baboyan, K. (Baboyan, K., et al., 2025), integrating the potential of environmental marketing into regional development can foster sustainable growth, improve social awareness, and mitigate ecological risks.

Environmental Marketing Concepts Environmental marketing has evolved from a niche strategy into a mainstream approach, emphasizing sustainability, corporate responsibility, and stakeholder engagement (Peattie & Crane, 2005). Firms leveraging environmental marketing not only improve brand reputation but also generate long-term financial and social benefits.

Regional development refers to policies and strategies aimed at improving economic performance, social equity, and environmental sustainability within specific geographic areas (European Bank for Reconstruction and Development [EBRD], 2023). By promoting green business practices, regions can reduce environmental degradation, attract green investments, and stimulate innovation in sustainable technologies.

Implementing environmental marketing strategies requires integrating financial management principles, including budgeting, investment planning, cash-flow forecasting, and risk assessment (Brigham & Ehrhardt, 2021). Firms must evaluate the long-term profitability of sustainable initiatives while ensuring liquidity and minimizing financial risks.

The EAEU provides a framework for economic integration among member states, including Armenia, Russia, Belarus, Kazakhstan, and Kyrgyzstan. Policies supporting environmental sustainability and regional cooperation can facilitate cross-border investments, knowledge transfer, and joint development projects (EBRD, 2023).

Methodology. This study employs a mixed-methods approach, combining qualitative and quantitative analyses:

1. **Case Study Analysis**: Evaluation of Armenian firms that have adopted environmental marketing strategies to identify best practices and challenges.
2. **Financial Review**: Examination of fiscal policies, access to green finance, and investment planning mechanisms in Armenia and EAEU countries.
3. **Policy Assessment**: Analysis of regional development strategies to identify opportunities for integrating environmental marketing with financial governance.

Findings. Companies implementing environmental marketing initiatives frequently encounter high upfront costs, uncertain returns, and limited access to financing. Without robust financial planning, such initiatives may be unsustainable.

Effective financial management—including cash-flow monitoring, risk assessment, and budgeting for sustainable projects—is essential for the long-term success of environmental marketing programs. Companies that align their sustainability strategies with financial governance are more likely to attract investments and achieve regional development goals.

Collaboration among EAEU member states can facilitate shared financing mechanisms, regional grants, and cross-border sustainable projects. Policy harmonization and joint investments reduce financial risks and enhance the effectiveness of environmental marketing initiatives (EBRD, 2023).

Table 1.

Green Investments and Environmental Expenditures in Armenia and Selected EAEU Countries (2023–2024)

Country	Green Investment (USD mln)	% of Total Corporate Investment	Government Environmental Expenditure (% of GDP)	Key Fiscal Incentives for Green Projects
Armenia	120	8%	0.9%	Tax credits, low-interest green loans
Russia	3,200	5%	1.2%	Subsidies for renewable energy projects
Belarus	450	6%	1.0%	Grants for energy efficiency programs
Kazakhstan	1,100	7%	1.1%	Reduced VAT on eco-products
Kyrgyzstan	90	4%	0.8%	Preferential loans for green SMEs

Sources: EBRD (2023); National Ministries of Economy and Environment Reports (2024)

Table 2.

Cash-Flow and Risk Management Practices in Green Projects (Sample Armenian Companies, 2023)

Company Name	Sector	Annual Green Investment (USD mln)	Cash-Flow Buffer (% of Investment)	Risk Assessment Practices
EcoEnergy LLC	Renewable Energy	10	15%	Scenario analysis, sensitivity testing
GreenTextiles CJSC	Manufacturing	5	10%	Diversification of suppliers and energy sources
HydroWater Ltd	Water Management	3	20%	Insurance and contingency planning
SolarTech Armenia	Solar Energy	7	12%	Long-term contracts with off-takers

Sources: Armenian Ministry of Economy (2024), Company Sustainability Reports (2023)

Financial Management and Regional Development Analysis. The data presented in Tables 1 and 2 indicate that effective financial management is a crucial enabler for successful environmental marketing initiatives and regional development in Armenia and the EAEU. Although Armenia's total green investment volume is smaller than that of Russia or Kazakhstan, it represents a significant

proportion of corporate investment (8%), reflecting a growing commitment to sustainable practices (Armenian Ministry of Economy, 2024).

The analysis of cash-flow and risk management practices in Armenian companies highlights that firms maintain buffers ranging from 10% to 20% of green investment to mitigate financial risks. Scenario analyses, sensitivity testing, and insurance mechanisms are frequently applied, emphasizing the importance of financial governance in sustaining environmentally oriented projects. Without such practices, investments in renewable energy, water management, or energy-efficient manufacturing could become financially unsustainable, limiting the potential for regional economic growth.

Governmental fiscal incentives, including tax credits, low-interest loans, and grants, further support the adoption of environmental marketing strategies. These instruments reduce the financial burden of green projects and encourage both small and large enterprises to invest in sustainable initiatives. In the context of the EAEU, cross-border cooperation could amplify these effects by facilitating co-investment opportunities, knowledge transfer, and harmonized regulatory frameworks (EBRD, 2023).

Overall, the integration of financial management with environmental marketing not only enhances corporate sustainability but also strengthens regional development outcomes. Strategic investment planning, risk mitigation, and public-private partnerships allow firms to contribute to economic diversification, job creation, and environmental protection, aligning Armenia's regional development goals with broader EAEU sustainability objectives.

Conclusion. Environmental marketing represents a vital tool for promoting regional development in Armenia and the EAEU.

Its successful implementation requires close alignment with financial management practices, including investment planning, cash-flow management, and risk assessment.

Regional cooperation, policy incentives, and capacity-building initiatives can strengthen the adoption of environmentally responsible business practices, ultimately contributing to sustainable economic growth and regional competitiveness.

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俄罗斯各地区科技发展：排名与战略重点分析
SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENT OF RUSSIAN REGIONS: ANALYSIS OF RANKINGS AND STRATEGIC PRIORITIES

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Abstract. *The article presents a comprehensive analysis of the scientific and technological development (STD) of Russian regions based on ranking data for 2021-2024. The study identifies key trends and regional disparities in innovation activity and determines the factors influencing the technological advancement of the constituent entities of the Russian Federation. Special attention is given to methodological approaches to assessing STD, including the analysis of integral indicators and ranking criteria. Using the Republic of Tatarstan as a case study, the paper examines successful practices in the implementation of regional scientific and technological policy. Recommendations are formulated for adapting effective STD strategies to other regions, including newly integrated ones.*

Keywords: *scientific and technological development, region, innovation development rankings, technological sovereignty, strategic planning.*

The scientific and technological development of the regions of the Russian Federation is gaining particular relevance in the context of ensuring technological

sovereignty and overcoming import dependence. As emphasized in the Strategy for Scientific and Technological Development of the Russian Federation, "ensuring the independence and competitiveness of the state, achieving national development goals, and implementing strategic national priorities through the creation of an effective system for expanding and fully utilizing the nation's intellectual potential" constitutes the primary objective of the country's scientific and technological development [1]. In this regard, the modernization of the scientific and technological potential of Russian regions, assessed through a system of rankings, becomes a crucial direction of state policy.

In recent years, Russia has developed a comprehensive system for assessing the STD of its regions, which includes:

1. The methodology of the Ministry of Science and Higher Education of the Russian Federation, comprising 40 indicators grouped into three blocks [2].
2. The Innovation Development Ranking of the Regions of the Russian Federation by the Institute for Statistical Studies and Economics of Knowledge of the National Research University Higher School of Economics (NRU HSE), which incorporates 50 indicators combined into 15 categories and grouped into five thematic indices [3].
3. The National Ranking of the Investment Climate by the Agency for Strategic Initiatives (ASI), which serves as the primary tool for assessing regional authorities' efforts to create favorable conditions for business. The methodology of this ranking is regularly updated and currently includes 110 indicators across eight areas, enabling a more precise and objective evaluation of the investment attractiveness of Russian regions, as well as accounting for new economic challenges and national development goals [4].
4. The annual Ranking of Scientific and Technological Development of Russian Regions by RIA Rating, based on 19 indicators divided into four categories: "Human Resources," "Material and Technical Base," "Effectiveness of Scientific and Technological Activity," and "Scale of Scientific and Technological Activity" [5].

It should be noted that all the rankings under consideration are aimed at providing a comprehensive assessment of the scientific and technological development of regions. However, they apply different methodological approaches, sets of indicators, and evaluation criteria. These differences explain the discrepancies in the final positions of the same region across various rankings. The key parameters of the assessment systems are presented in Table 1.

Table 1

*Comparative analysis of methodologies for assessing the scientific and technological development of regions**

Developer Organization	Period	Number of Indicators	Number of Indicator Groups
Ministry of Science and Higher Education of the Russian Federation	2021-2022	33	3 blocks
Ministry of Science and Higher Education of the Russian Federation	2023	43	3 blocks
Ministry of Science and Higher Education of the Russian Federation	2024	40	3 blocks
National Research University Higher School of Economics (NRU HSE)	2021-2023	53	5 blocks
National Research University Higher School of Economics (NRU HSE)	2024	55	5 blocks
National Research University Higher School of Economics (NRU HSE)	2025	50	5 blocks
Agency for Strategic Initiatives (ASI)	2021-2023	70	4 areas
Agency for Strategic Initiatives (ASI)	2024	70	8 areas
Agency for Strategic Initiatives (ASI)	2025	110	8 areas

*Compiled from: [2-5].

According to the data presented in Table 1, annual changes were observed in the methodology of the Ministry of Science and Higher Education of the Russian Federation, which was reflected in the number of indicators considered – from 33 in 2021-2022 to 40 in 2024. Despite these modifications, the assessment structure based on three key blocks remained consistent, allowing for a comparative analysis of the dynamics of scientific and technological development across regions throughout the entire period under review.

The Ministry of Science and Higher Education of the Russian Federation calculated the integral indicator of STD for Russian regions for 2021–2023 (Table 2). According to these data, the consistent leaders are Moscow and St. Petersburg, as well as the Republic of Tatarstan, which invariably ranked among the top five. This is explained by the concentration of financial and human resources, high-tech industries, and research institutes in these regions. As a rule, the lowest positions in the ranking are occupied by the republics of the North Caucasus (for example, Ingushetia), the Jewish Autonomous Region, and several regions of the Far East and Siberia (such as the Nenets Autonomous Okrug). This is largely due to low innovation activity, the absence of major scientific centers, and challenging socio-economic conditions.

Table 2

*Integral indicator of scientific and technological development of Russian regions in 2021–2023 (points)**

Rank	Region (RF)	2021	2022	2023
1	Moscow	212.4	212.0	192.8
2	St. Petersburg	205.5	211.7	183.6
3	Republic of Tatarstan	192.2	211.7	179.2
4	Moscow Region	179.4	198.7	144.0
5	Tomsk Region	204.5	196.8	163.2
6	Novosibirsk Region	187.5	198.6	161.2

*Compiled from: [2, 6].

In 2023, changes occurred in the category “Authorities”: the number of indicators increased from 10 to 18, indicating greater attention to the role of regional governments in creating conditions for scientific and technological development. Moscow retained its leading positions but weakened them in the category “Environment for Knowledge-Intensive Business,” where the Republic of Tatarstan took the lead with a result of 72.9%.

The analysis of the main indicators of innovation activity of the constituent entities of the Russian Federation for 2021–2023 revealed leaders across different criteria (Table 3).

Table 3

*Share of innovative goods, works, and services in the total volume of shipped goods, completed works, and services of industrial production organizations, %**

Region	2021	2022	2023
Republic of Tatarstan	20.8	21.5	22.9
St. Petersburg	15.8	10.7	9.8
Samara Region	9.8	10.0	14.1
Moscow Region	9.5	6.9	9.4
Republic of Bashkortostan	9.9	6.2	8.9

*Compiled from: [7].

In 2021-2023, the Republic of Tatarstan ranked first in terms of the share of innovative goods, works, and services in the total volume of shipped products, demonstrating values ranging from 20.8% to 22.9%, which is significantly above the national average.

According to the assessment of the NRU HSE, the leaders in the 2024 Innovation Development Ranking of the Regions of the Russian Federation, based on the Russian Regional Innovation Index, were: Moscow (0.5795), St. Peters-

burg (0.5229), the Republic of Tatarstan (0.5123), the Nizhny Novgorod Region (0.5069), and the Novosibirsk Region (0.4790) [8, p. 20].

Moscow's leadership is ensured by its superiority in several aspects, including the number of patent applications for inventions filed abroad, as well as the export of goods, services, and technologies. The Republic of Tatarstan demonstrated the best results in the "Innovation Activity" index due to the high level of activity and effectiveness of its innovation-oriented businesses.

In accordance with the directive of the President of Russia, constituent entities of the Federation are developing and approving state programs in the field of scientific and technological development. The Republic of Tatarstan has adopted a program aimed at strengthening its position as one of the national leaders in innovation-driven development. Its main goal is the formation of a robust, self-sustaining scientific and educational ecosystem for the region's innovative development in the country's priority areas. The program seeks to overcome the misalignment between educational, scientific, and industrial organizations, as well as to enhance participation in federal programs.

Tatarstan's strengths in the field of scientific and technological development are reflected in its high rankings: second place in the national ranking of scientific and technological development and in the investment climate ranking, and third place in socio-economic development. The region ranks second in innovation development (after Moscow). It also demonstrates a high share of employment in high-tech industries, patenting activity, and the implementation of technological innovations. Investment in fixed capital accounts for 21.3% of the gross regional product (20.2% higher than the national average). The share of high-tech industries in the gross regional product stands at 19% (compared to the national average of 18.5%) [9].

The scientific and technological development program of St. Petersburg is currently in the stage of active formation. In its design, the guiding frameworks are the Strategy for Scientific and Technological Development of the Russian Federation, regional legislation, megaprojects, and the specific features of the city. The foundation is based on the state program of St. Petersburg Knowledge Economy in St. Petersburg. Planned initiatives include the construction of "technological valleys"—complexes with educational facilities, dormitories, laboratories, and business parks. Educational and scientific opportunities for students, young researchers, engineers, and entrepreneurs will be concentrated within a single territory. Conditions will be created for the identification and development of talents, with at least 30 children's technoparks and digital development centers expected to open. Centers of mathematical education will also be established to foster research-oriented thinking in children and to support young scientists and student-led research.

The regional state program Scientific and Technological Development of the Sverdlovsk Region will be launched in 2025. Its objective is to increase the share of high-tech and knowledge-intensive industries in the gross regional product by 1.5 times by 2030 compared to 2022 [10]. Key industries include mechanical engineering, the chemical industry, mining, and metallurgy. Promising directions of development comprise high-speed transport, the production of drones and their components, civil and special-purpose machinery, the creation of new materials and pharmaceuticals, the development of nuclear energy and nuclear medicine. The program also includes measures to support enterprises engaged in high-tech projects: preferential loans, subsidies for the establishment of technoparks in the electronics sector, tax incentives, and other forms of assistance.

Since March 2025, the Novosibirsk Region has been implementing the state program Scientific and Technological Development of the Novosibirsk Region, aimed at strengthening cooperation between ministries and organizations, consolidating public support tools, and accelerating the introduction of scientific developments across all sectors of the economy [11].

These programs are designed to create scientific and industrial ecosystems within the constituent entities of the Federation, to provide state support measures for participants in scientific and educational centers, including preferential loans and partial reimbursement of costs for the implementation of significant projects.

The following section will examine in greater detail the reasons for the high positions of the Republic of Tatarstan in various scientific and technological development rankings, with a view to adapting this experience for other Russian regions, including newly integrated ones.

Key advantages of Tatarstan:

1. Strong scientific and technological potential: the republic's universities and research institutions participate in all key initiatives of the national project Science and Universities and other technological development programs.

2. System for building research and engineering competencies: development occurs along the entire chain of continuous education, starting from school.

3. Well-developed infrastructure: this includes two special economic zones, five territories of special economic development, eight technopark structures, as well as funds supporting innovation and entrepreneurial activities.

4. Support for the development of science and technology: state investments are increasing, new research centers and laboratories are being established, and the grant system is expanding.

The Strategy for Scientific and Technological Development of the Republic of Tatarstan is synchronized with the priorities of its Strategy for Socio-Economic Development until 2030 and takes into account three main priorities:

– formation and accumulation of human capital;

– creation of a comfortable environment for the development of human capital;

– establishment of economic relations and public institutions in which human capital is demanded by the economy.

In 2025, Tatarstan developed a Concept for Popular Science Tourism until 2035, which included proposals for 63 new sites: five routes of popular science tourism based on Kazan Federal University (KFU), Kazan National Research Technical University named after A.N. Tupolev (KNRTU-KAI), Innopolis University, and the IT-Park named after Bashir Rameev. As of January 2025, 71 objects of popular science tourism located in Tatarstan are listed in the All-Russian Register. By this indicator, the region ranks second among all subjects of the Russian Federation, behind only St. Petersburg [11].

Based on the conducted analysis, the following recommendations can be made for the development of the scientific and technological potential of regions, including newly integrated ones:

1. It is necessary to develop state programs for scientific and technological development that take into account regional specificities and are aligned with the federal STD strategy.

2. It is advisable to concentrate resources on supporting scientific and technological programs that ensure technological sovereignty and import substitution.

3. To accelerate the introduction of developments into production, interaction between research organizations, universities, and industrial enterprises should be strengthened.

4. Measures must be implemented to attract and retain highly qualified specialists in the regions, while supporting young scientists and entrepreneurs.

5. It is advisable to study and adapt the successful experience of STD leaders such as Moscow, St. Petersburg, and the Republic of Tatarstan.

The analysis revealed significant disparities in the level of scientific and technological development across Russian regions, with Moscow, St. Petersburg, and the Republic of Tatarstan remaining the consistent leaders. Their success is explained by the concentration of scientific potential, a well-developed innovation infrastructure, and effective regional policy in the field of STD.

To ensure technological independence and sustainable development of Russia under external challenges, the modernization of the scientific and technological potential of regions appears essential. An effective model can be drawn from the experience of Tatarstan, where success has been achieved through the synergy of three components: workforce training, creation of a favorable environment for knowledge-intensive enterprises, and the establishment of interaction between the state, the academic community, and the real sector of the economy. Adapting this strategy to the conditions of other regions will make it possible to unlock their unique potential.

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SELECTION OF AN ENTITY OF INNOVATION INFRASTRUCTURE THAT PROMOTES THE INTEGRATION OF NEW REGIONS INTO THE RUSSIAN SCIENTIFIC AND TECHNOLOGICAL SPACE[1]

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摘要：本文论证了选择技术平台（TP）作为创新基础设施核心实体，将俄罗斯新区域纳入共同科技空间的合理性。通过对各类机构（企业孵化器、科技园区、集群）的比较分析，本文得出结论：TP 最能满足加速协调与发展的任务。其优势在于能够构建统一的沟通环境，促进科学、商业和国家之间的互动，吸引投资，组织合作项目，并构建交流最佳实践的知识库。选择技术平台作为新区域的关键在于其灵活性、较低的建设成本以及能够履行支持创新的全方位职能。该机制有利于将资源集中于优先领域，加速开发成果的商业化，从而释放各区域的科技潜力，促进其在俄罗斯联邦的可持续发展。

关键词：创新基础设施实体、新区域、俄罗斯、技术平台、一体化、科技空间。

Abstract. *The article justifies the selection of a technological platform (TP) as the key entity of innovation infrastructure for integrating new regions of Russia into the common scientific and technological space. Based on a comparative analysis of various institutions (business incubators, technoparks, clusters), it*

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is concluded that a TP most fully meets the tasks of accelerated harmonization and development. Its advantages lie in its ability to form a unified communication environment for interaction between science, business, and the state, attract investments, organize cooperative projects, and create a knowledge base for exchanging best practices. The key rationale for choosing a TP for new regions is its flexibility, low resource costs for establishment, and ability to perform the entire range of functions for supporting innovation. This mechanism facilitates the concentration of resources on priority areas, accelerated commercialization of developments, and, as a result, the unlocking of the scientific and technological potential of the territories for their sustainable development within the Russian Federation.

Keywords: *innovation infrastructure entity, new regions, Russia, technological platform, integration, scientific and technological space.*

In the modern economy, whether at the regional or national level, the activation of innovative activity plays a central role. It is innovations that serve as the main driver of economic growth, increasing competitiveness and contributing not only to the quantitative increase of the state's macroeconomic indicators but also to its qualitative, progressive development, which ultimately positively affects the welfare and quality of life of the population. The inclusion of new territories into the legal, economic, and social field of Russia is a strategic national priority, and their scientific and technological integration is a key element of this process, ensuring not only economic growth and import substitution but also strengthening national security and technological sovereignty. However, these regions require targeted development of their scientific and innovation ecosystem, which was historically oriented towards different economic and scientific ties. Consequently, identifying the most effective institution capable of acting as a catalyst and integrator is a critically important task for the accelerated harmonization of legislation, cooperation with Russian enterprises and universities, attracting investments, and, ultimately, for ensuring the sustainable and innovative development of these territories as part of the Russian Federation.

Within the framework of terminological analysis, innovation infrastructure should be understood as a complex of interconnected resources, tools, and conditions that ensure the implementation of innovation processes and the development of the state's innovation potential. Key elements of this system include entities such as accelerators, incubators, technoparks, shared-use and technology commercialization centers, technological platforms, and other institutions facilitating the generation and development of innovations. A number of researchers rightly expand this list to include international research centers and institutes, justified by their role in creating technoparks, laboratories, as well as research and testing

centers based on research institutes and universities [1, 2]. Let us consider the essence of innovation infrastructure entities from the perspective of facilitating the integration of new regions into the Russian scientific and technological space.

A business incubator specializes in comprehensive support and development of entrepreneurship, performing multifaceted functions. Its activities include forming teams to support startups in early stages and creating favorable conditions for small enterprises, providing business incubation services, as well as assisting in attracting public and private funding sources. Furthermore, a business incubator provides advisory assistance in overcoming administrative barriers, organizes participation in negotiations, exhibitions, and presentations, and implements adaptation programs for enterprises after graduation. Important areas of work include conducting information campaigns among young researchers to stimulate interest in entrepreneurship, developing mechanisms for interaction with the external environment (entrepreneurs, organizations), and carrying out marketing expert research activities [3].

A technopark is a set of technological infrastructure facilities, including real estate objects fully or partially owned by a state entity and/or municipal formation and/or private ownership, including land plots, office buildings, laboratory and production premises, engineering, transport, residential, and social infrastructure facilities, created for the activities of small and medium-sized enterprises in the high-tech sector and managed by a management company [4].

A high-tech technopark territorially unites scientific and educational organizations, financial institutions, enterprises, and entrepreneurs interacting with each other and with government authorities at various levels within the framework of forming a modern technological and organizational environment, aiming for innovative entrepreneurship and the implementation of venture projects [5]. An industrial technopark is a technopark intended for entities engaged in industrial production, and/or scientific and technical activities, and/or innovative activities for the purpose of mastering industrial production of industrial products and commercializing scientific and technical results, managed by a management company [6].

A technological platform (TP) is an entity of innovation infrastructure aimed at uniting the efforts of stakeholders to create advanced technologies, new products, or services by attracting special resources for research and development [7]. The main functions of a technological platform include a set of tasks aimed at strengthening the influence of economic entities' needs and accelerating the development of promising areas of engineering and technology. This ensures the creation and practical implementation of innovative products and technologies necessary for the socio-economic development of the state. The platform unites efforts and coordinates effective interaction between business, science, the state, and public organizations in the processes of economic modernization based on advanced

scientific and technical achievements. Its functions include analyzing the state and prospects of development in relevant technological areas, assessing domestic innovation potential and opportunities for adapting best foreign practices. The technological platform conducts expertise of scientific, technical, and innovation projects, identifies new opportunities for modernizing existing and forming new economic sectors, contributes to the improvement of the regulatory framework in the field of innovation, and expands scientific and production cooperation, forming new partnerships in the innovation sphere [8].

An engineering company (center) is a legal entity providing engineering and consulting services. Its activities are related to the implementation of projects of various purposes through the optimal selection and efficient use of material, labor, technological, and financial resources in their complex interaction. This is achieved through the application of modern methods of organization and management based on advanced scientific and technical achievements, considering the specifics of particular conditions and project requirements.

An innovation and technology center (innovation center) is an organization created on the basis of a scientific institution or its pilot production, which possesses a property complex including office and production premises with appropriate equipment. This infrastructure is used for leasing to small enterprises on a contractual basis or for conducting its own innovation activities. The center has qualified personnel who provide technological, informational, advisory, and other services to support innovation processes.

An innovation and technology cluster is an association of independent enterprises, scientific institutions, service organizations ensuring the interaction of science and production, as well as supporting structures (brokerage, consulting firms) and consumers, operating within one region and economic sector. Its key goal is to stimulate innovation activity through intensive interaction among participants, shared use of resources, and exchange of knowledge and competencies, which facilitates technology transfer, formation of cooperation networks, and dissemination of information among cluster entities [9].

Based on the conducted analysis of entities, at the initial stage, the formation of the innovation infrastructure of new regions should begin with the creation of a TP, which will perform all necessary functions for promoting innovation projects and R&D results, facilitating the realization of scientific, technological, and innovation potential through the rapid commercialization of intellectual activity results, based on improving the efficiency of communication among its innovation actors. A number of advantages of using a TP that accelerate the entry of new regions into the Russian scientific and technological space should be highlighted [10-12]:

1. Formation of a collaborative environment. The TP serves as a communication basis for forming a unified ecosystem where participants combine efforts

and assets, facilitating technology transfer through open exchange of data on their needs, competencies, and developments. This allows for identifying the most promising developments for subsequent market launch.

2. Knowledge base and best practices. A key function of the TP is stimulating the exchange of intangible assets, such as knowledge and experience. Participants adopt successful methodologies and use lessons learned from previous projects, leading to better decision-making in the innovation sphere.

3. Attracting investments and assets. TPs provide access to critical resources: funding from private investors, funds, and government programs, as well as to material base – experts, laboratories, and modern equipment, which increases the efficiency of technology transfer, reducing associated costs and risks.

4. Organization of cooperative projects. Within platforms, participants initiate joint R&D, combining competencies to solve complex technological problems and create innovative products. Such cooperation accelerates the technology development and implementation cycle while distributing risks among partners.

5. Formation of partnership networks. TPs serve as a tool for building sustainable professional connections, which become a valuable strategic asset for participants who continue to work even after the completion of individual projects, ensuring the continuity of the technology transfer process.

Thus, the goal of technological platforms is to consolidate the resources of the scientific and educational spheres, business, and society to prepare and implement long-term projects for creating innovations in the state's priority technological areas.

Based on this goal, the following key tasks are set for TPs:

– stimulating the inflow of private investments into new technologies by increasing the circle of potential rights holders and beneficiaries of intellectual activity results with state support;

– concentration of resources on key areas of technological development;

– determining priority areas of scientific and technological progress based on the tasks of socio-economic development of the country and its regions;

– selection and support of the most promising and significant innovation projects in the field of research and development;

– promoting technological modernization of enterprises through the development of scientific and technological cooperation;

– creating favorable conditions for the commercialization and integration of new technologies into the national economy.

In conclusion, it should be emphasized that the key direction for the innovative development of new regions is the formation of an integrated system that unites science, business, financial institutions, the state, and civil society. This synthesis is realized through the creation of comprehensive innovation infrastructure,

where the TP is destined to play a key role. For the new regions of Russia, this mechanism seems most appropriate, as it ensures the performance of the entire spectrum of functions for promoting innovation projects and implementing scientific research results. The TP contributes to unlocking scientific and technological potential through the accelerated commercialization of intellectual activity results, achieved by establishing effective communications among all participants in the innovation process. Important advantages of the TP are its voluntary basis, self-financing and self-government, as well as minimal legal requirements and low resource costs for creation, making it not only a theoretically sound but also a practically feasible tool, the relevance of whose implementation in the new regions can hardly be overestimated.

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白俄罗斯共和国银行业的金融稳定：投资增长的新途径
FINANCIAL STABILITY OF THE BANKING SECTOR IN THE REPUBLIC OF BELARUS: NEW APPROACHES TO INVESTMENT GROWTH

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摘要：本文探讨了白俄罗斯共和国为刺激和增加国内投资活动而提供的国家支持。此外，本文还探讨了如何通过对白俄罗斯共和国银行业提出新的要求来维护国家金融稳定，从而提高银行对经济的参与度，并在2025年增加投资贷款。

关键词：金融稳定、可持续经济发展、投资、政府项目、银行、投资融资。

Abstract. *The article examines the state support provided by the Republic of Belarus to stimulate and increase investment initiatives in the country. The article also discusses new aspects of maintaining the country's financial stability by introducing new requirements for the banking sector of the Republic of Belarus to increase banks' requirements for the economy and increase investment lending in 2025.*

Keywords: *financial stability, sustainable economic development, investments, government programs, banks, and investment financing.*

In recent years, the issue of the need to increase investment potential and ensure the financial stability of the Republic of Belarus has remained on the agenda of the Government, relevant ministries, and other agencies responsible for ensuring economic stability and development in the long term. In recent years, the Republic of Belarus has been forced to reorient its economic vector towards new markets for goods and services (in "distant countries") due to unprecedented sanctions pressure from unfriendly countries. The company has adapted its cross-country communication channels and developed new mechanisms for promoting and selling its products.

Statistics on foreign economic activity confirm the adaptability of the Belarusian production model in the face of economic challenges and sanctions. In recent years, the foreign trade turnover of goods in the Republic of Belarus has shown stable growth, despite the difficult years of 2020 (when the World Health Organ-

ization declared the COVID-19 pandemic on March 11, 2020) and 2022 (when the special military operation began on February 24, 2022), when the Republic of Belarus continued to maintain its production capacities despite the global epidemiological crisis and unprecedented Western sanctions. Over the past 5 years, foreign trade turnover has increased by USD 13.6 billion (or 19%) (Figure 1).

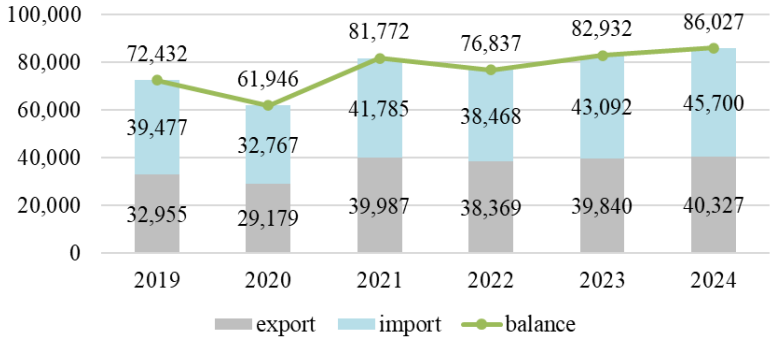

Figure 1. *Foreign Trade Indicators, million USD*

Data source: National Statistical Committee of the Republic of Belarus [1]

However, relying solely on the country's export potential without investing in major projects that can drive the national economy's growth and increase the competitiveness of domestic products is not sufficient in the current circumstances.

The legal framework and basic principles for making investments in the Republic of Belarus are set out in the Law of the Republic of Belarus No. 53-Z dated July 12, 2013, "On Investments" (hereinafter referred to as Law No. 53-Z).

Law No. 53-Z defines that investments are property and other objects of civil rights owned by the investor by the right of ownership, by another legal basis allowing him to dispose of them, invested by the investor in the territory of the Republic of Belarus for the purpose of profit (income) and (or) achievement of another significant socio-economic result, for other purposes not related to personal, family, household and other similar use, in the form of:

- money (money), including attracted (including loans, credits), shares, other movable or immovable property;

- claims that have an estimated value (in monetary terms), shares in the authorized capital, and shares in the property of a commercial organization established in the Republic of Belarus;

- other objects of civil rights that have an estimated value (in monetary terms), except for types of objects of civil rights that are not allowed to be in circulation (objects that are withdrawn from circulation) [2].

The Council of Ministers of the Republic of Belarus determines priority sectors of the economy and areas (types) of activity for investment, and ensures the implementation of a unified state investment policy determined by the Head of State.

The investment support program is approved annually by the decision of the President of the Republic of Belarus and is aimed at creating and developing the country's social, industrial, and engineering infrastructure with rapid returns and comprehensive effects.

The State Investment Program is the main document of the Republic of Belarus for financing state construction from the republican budget.

The volume of state capital investments financed from the republican budget increases every year. For example, government support for 2021 was planned in the amount of 0.7 billion. belarusian rubles (BYN). And for 2025, the approved amount of aid has already reached 2.2 billion. belarusian rubles (BYN) [3].

State support is also provided through the use of specific mechanisms, such as the provision of budget loans and budget transfers.

A budget loan is characterized by a specific purpose for the use of budget funds on the basis of repayment, urgency, and payment. Thus, the Head of State may provide state financial support for the implementation of investment projects through the provision of a budget loan. The procedure for providing a budget loan is defined in the Budget Code of the Republic of Belarus.

In addition, starting from 2024, if an investment project is recognized as a priority activity for investment and meets the criteria (based on a financial and economic assessment) set by the Council of Ministers of the Republic of Belarus, and is included in the list of investment projects eligible for support in the next financial year, the investment initiative (activity) will also be supported by the government through budget transfers. A budget transfer is a compensatory return of part of the investments (costs) made during the implementation of an investment project in certain regions (separate administrative-territorial units, OATEs). The mechanism of this support provides for the phased receipt of budget returns from capital investments: after the facility is put into operation (Stage 1 – 40% of the budget transfer amount, hereinafter referred to as the BTA), after the facility reaches its design capacity according to the business plan (Stage 2 – 40% of the BTA), and after 1 year after reaching its design capacity (Stage 3 – 20% of the BTA) [4].

Thus, the government has provided significant support for stimulating and increasing investment initiatives in the country. Additionally, as per the decision of the National Bank of the Republic of Belarus, starting from April 2025, the banking sector will make a significant contribution to financing major investment projects.

In addition, the National Bank of the Republic of Belarus sets new mandatory targets for the growth of banks' requirements for the economy for the country's banking sector every year. For 2025, the growth rate is set at 11-14% [5]. The growth rate of banks' claims on the economy reflects the extent to which the banking sector contributes to the country's sustainable economic development.

In addition, for the first time, the banking sector has set a new target of at least 16% growth in investment financing by the end of 2025.

Today, the Development Bank is the main financial institution in the banking sector of the Republic of Belarus, providing long-term financing for the implementation of investment projects within the framework of state programs, investment projects that are eligible for state financial support, as well as investment projects selected by the Development Bank in accordance with the decision of the Head of State.

One of the tasks of the Development Bank of the Republic of Belarus OJSC (here in after referred to as the Development Bank), in accordance with the mandate defined by Decree of the President of the Republic of Belarus dated June 21, 2011 No. 261 "On the establishment of the Open Joint Stock Company Development Bank of the Republic of Belarus", is to provide loans for the implementation of investment projects within the framework of state programs, investment projects applying for state financial support, financing of activities involving the acquisition of property for financial lease (leasing), investment projects by decision of the President of the Republic of Belarus and investment projects independently selected by the Development Bank in accordance with the procedure established by the Council of Ministers of the Republic of Belarus in coordination with the President of the Republic of Belarus, as well as the implementation of financial and economic assessment, determination of financing structure, monitoring and support of investment projects implementation [6].

The Development Bank provides financing for state programs of a socio-economic nature. The financing provided for major investment projects contributes to the diversification of the Belarusian economy and increases its efficiency, including through financial support for infrastructure projects, the construction of new enterprises and the modernization of existing ones, as well as the renewal of the active part of fixed assets through financing the leasing of equipment produced by Belarusian manufacturers.

At the same time, due to the 2025 target for increasing investment financing, all participants in the country's banking sector will provide financial support for investment development in the Republic of Belarus starting from 2025.

At the same time, the growth parameters provided to Belarusian banks and the establishment of more attractive conditions for funds attracted to deposits will help stimulate the population to place temporarily available funds for a long-term

(over a year). This, in turn, will expand the resource potential of the banking sector to enhance the role of banks in investment financing. The predominant formation of the banks' resource base at the expense of long-term sources will make it possible to direct large amounts of funding to investment projects.

Taking into account that the indicator on the growth of investment financing is new, there is currently no statistical information on investment loans. The results of the banking sector's performance in 2025 will serve as a starting point for setting future targets for the growth of banks' investment portfolios.

Thus, in order to ensure the breakthrough (innovative) development of the Republic of Belarus, support for long-term, capital-intensive investment and infrastructure projects is being provided through the expansion of new types of financial support, such as financing investment projects with the commercialization of the results of scientific and technical activities, financing industrial mortgage projects, competitive lending for investment projects, and co-financing, which is already an essential attribute of the country's future development.

It is expected that the participants of the country's banking system will contribute to the innovative promotion and development of the Republic of Belarus in close cooperation with the involvement of professional expert judgment from representatives of the scientific community: the National Academy of Sciences of Belarus, the Belarusian Innovation Fund, the State Committee for Science and Technology, and others. After all, science, modern technologies, and innovations, provided with proper funding and the right development vector, will ensure the necessary synergistic effect and contribute to the growth of the investment potential of the Republic of Belarus.

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在社会政治转型背景下开发市政服务的人力资源潜力
DEVELOPING THE HUMAN RESOURCES POTENTIAL OF MUNICIPAL SERVICES IN THE CONTEXT OF SOCIO-POLITICAL TRANSFORMATIONS

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摘要：本文探讨了在我国当前发展时期，包括市政服务层面在内的各级人事政策改进方向问题。人力资源开发任务的实施取决于有效的人力资源政策——人员的选拔、招聘和安置；对符合职位要求的诊断程序进行监控；工作场所的物质和技术支持；制定管理层与员工之间互动的激励机制；促进专业发展和提高专业活动效率；支持年轻专业人员，建立指导制度。这些条件为在社会政治转型背景下开发市政服务部门的人力资源潜力，以解决国家问题和实施国家项目创造了机会。

关键词：人力资源潜力，市政服务，人力资源政策。

Abstract. *The article examines the issue of the vector of direction of improvement of personnel policy at all levels, including at the level of municipal service, which is significant at the current moment of development of our country. The implementation of the task of developing human resources potential can be determined by a competent human resources policy - selection, recruitment and placement of personnel; monitoring of diagnostic procedures for compliance with the position held; material and technical support of workplaces; formation of motivational algorithms for interaction between management and personnel; stimulation of professional development and efficiency of professional activity; support of young specialists as institutionalization of mentoring. These conditions create the opportunity to develop the human resources potential of the municipal service in the context of socio-political transformations to solve national problems and implement national projects.*

Keywords: *human resources potential, municipal service, human resources policy.*

The President of the Russian Federation V.V. Putin, in his speech on May 7, 2024, taking office, said: "...in today's complex world, which is changing rapidly,

it is necessary to be self-sufficient and competitive, to open up new horizons for the country."

In the address of the President of the Russian Federation V.V. Putin dated 31.12. 2022 it is said: "Since 2014, after the Crimean events, Russia has been living under sanctions, but this year a real sanctions war was declared on us. Those who started it expected the complete destruction of our industry, finances, and transport. This did not happen, because together we created a reliable margin of safety."

In relation to the objectively created conditions of socio-political transformations, the development of the personnel potential of the municipal service is of great importance. The municipal service is the cutting edge of intrastate activity, which implements national development tasks. In terms of implementing national programs and current economic development projects, it is relevant to identify the contradictions of the current moment in municipal services. For reference: "The municipal service in the Russian Federation - according to paragraph 1 of Article 2 of the Federal Law of March 22007 "On Municipal Service in the Russian Federation" No. 25-FZ, this is professional service activity citizens, which is carried out on an ongoing basis positions municipal service, replaced by concluding employment(contract). All positions in the structure of local government bodies are divided into:

1. Municipal positions (deputies representative body of local government, members of elected bodies of local government, elected officials of local government, members of electoral commissions of municipalities with the right to vote);
2. Municipal service positions - a position in a local government body self-government, device electoral commission municipal formation, which are formed in accordance with the charter of the municipality, with an established range of responsibilities to ensure the execution of the powers of the local government body, the electoral commission of the municipality or the person holding a municipal position."[1]

Based on the substantive characteristics of the regulatory documents concerning the Municipal Service of the Russian Federation and the existing socio-political conditions, the existing contradictions should be described, namely:

- Between the proposed new socio-political conditions for the activities of all branches of government and municipal service in particular and the lack of sufficient training of municipal service personnel for the productive implementation of their important professional activities for people.

- Between the demand of the population in the new Russian socio-political conditions for ensuring decent living conditions and the lack of readiness to work in the new conditions and the lack of a model for training and retraining municipal service personnel in the new conditions.

The identified contradictions determined the relevance of the study of the issue of developing the human resources potential of the municipal service, which directly deals with and fulfills the requests of citizens.

Thus, it is necessary to form the personnel potential because "personnel decide everything" [2] in the words of the General Secretary of the Central Committee of the CPSU Joseph Vissarionovich Stalin, who possessed an extraordinary gift of anticipatory competence, understanding the full power of training and education of people to solve management problems of all branches of government.

"Human resources are the potential of an organization, which should be considered as the general level of human resources for the organization's existence and development." [3]

It is necessary to define the category of human resources: this category consists of two constituent concepts - human resources from the word "personnel", where "personnel are qualified, specially trained workers for a particular activity, when their appropriate use assumes the maximum return on what a specialist is able to give according to his education, personal qualities and acquired work experience." [3]

The second component of human resources potential is potential, in our case, the potential of the employee. And "the human resources potential of an employee is a set of physical and spiritual qualities of a person that determine the possibility and limits of his participation in work activities, the ability to achieve certain results in given conditions, and also to improve in the process of work." [3]

Human resources potential as a multi-level and poly-structural phenomenon at an enterprise or organization has primarily a socio-economic coloring and is determined by the following components: personnel of the organization - the typology of personnel and their qualification characteristics are divided into professional (qualification), gender, age, educational, and level of work experience.

National projects, which are under special control and, one might say, under the "manual control" and systemic control of the President of the Russian Federation, require, in the context of socio-political transformations, firstly, the creation and training of personnel, in particular, personnel of the municipal service, and secondly, the development (growth) of human resources potential - these are mandatory conditions for the implementation of the national tasks of our country.

The development of the human resources potential of the municipal service, being a multi-component activity of the organization's human resources department, can be based on already existing proven components, such as:

1. Personnel planning: quantitative demand for personnel, selection and recruitment of personnel, formation of personnel reserve
2. Material and technical support of workplaces
3. Diagnostics of employees' suitability for the position they hold

4. Formation of motivation for professional development and efficiency of activity through the creation of mechanisms of "reward and punishment"
5. Monitoring "feedback" via the Intranet system
6. Competent management of the development of human resources is possible through the institutionalization of coaching - mentoring, periodic training of an intra-organizational nature with the invitation of specialist teachers, systematic training in advanced training courses for municipal employees, internships and theoretical training of the management level of the municipal service at the Presidential Academy of the Russian Federation.

The implementation of the listed components will ensure the development of the human resources potential of the municipal service in the context of socio-political transformations to solve national problems and implement national projects.

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科研生产企业海洋机器人设施创新产品实施的经济工具细节
THE SPECIFICS OF THE ECONOMIC TOOLS FOR THE IMPLEMENTATION OF INNOVATIVE PRODUCTS OF MARINE ROBOTICS FACILITIES OF SCIENTIFIC AND PRODUCTION ENTERPRISES

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摘要：本文探讨了实施海洋机器人创新产品的经济工具的具体细节，并分析了专业化无人平台实施的当前趋势和未来发展方向。基于渔业综合体财务指标的预测值，确认了积极的经济效应。

关键词：海洋机器人工具、海洋专业化无人平台、创新产品、经济影响。

Abstract. *The specifics of the economic tools for the implementation of innovative products of marine robotics are considered. The current trends and further directions of development of the implementation of a specialized unmanned platform are considered. Based on the forecast values of the financial indicators of the fisheries complex, a positive economic effect has been confirmed.*

Keywords: *marine robotics tools, marine specialized unmanned platform, innovative products, economic impact.*

Innovative products of marine robotics in modern conditions are of strategic importance for all regions of the Russian Federation. The economic and social situation of regions with maritime borders directly depends on the level of development of marine instrumentation and robotics at research and production enterprises of marine regions. Due to its specific nature, the sale of products of such enterprises has a weak side if it is considered only from the point of view of profitability, which in the case of scientific innovative developments is not a significant criterion due to a narrow application area, single or small serial production. That is why the specifics of economic tools for the development, production and sale of

innovative products of marine robotics tools require predictive assessments in the future, not from the point of view of immediate profitability, but from the point of view of those socio-economic and industrial areas for which the main development strategies for marine activities of the Russian Federation are defined [7].

The innovative activity of enterprises includes not only the direct innovative process of transforming scientific knowledge into new types of products and services, but also activities aimed at the dissemination, commercialization and use of an innovative product [2]. Based on this, it should be noted that for research and production enterprises, these stages of innovation activity should also be given significant attention.

Therefore, one of the tasks of the economic toolkit is to identify and show interested parties the socio-economic and industrial value of promoting innovative products of marine robotics for the subjects of the Russian Federation, especially coastal ones, in the following areas [7]:

- ensuring the functioning of port areas;
- development of the fisheries sector;
- development of cruise and water tourism;
- use, restoration and environmental protection of the seashore and adjacent sea area;
- development of proposals and programs on projects for the development of coastal territories and coastal water areas.

First of all, the implementation of innovative products of marine robotics is aimed at the most significant of the economic activities of marine regions – the fisheries complex.

The market needs are growing and, with the increasing introduction of unmanned systems in various sectors of the national economy of the Russian Federation and the simultaneous withdrawal of foreign manufacturers of such products from the domestic market, the need for them is steadily increasing.

Currently, specialized non-emergency platforms for various purposes are quite in demand, and in the future, when the offered specialized non-emergency platforms appear on the market, the demand will grow by at least 15-20% annually. This is due to the development of branches of the national economy that depend on an objective multi-factor assessment of the parameters of the water environment, migration of bioresources, and the environmental situation, including the actualization of tasks in the search for new areas for the extraction of aquatic bioresources.

Developments of unmanned marine vehicles are widely represented on the world market [6], for example, the following:

- In February 2025, Kongsberg Maritime launched HUGIN Edge, a compact and lightweight autonomous underwater vehicle (AUV) designed for coastal and offshore operations.

- In January 2025, BAE Systems announced a partnership with Canadian firm Cellula Robotics to develop long-life fuel cell AUV.
- In October 2024, L3Harris Technologies introduced a new medium unmanned Surface vehicle (MUSV) platform.

In Russia, the scientific and production base of a scientific organization has developed and is ready for implementation a marine crew-free specialized platform [1], shown in Figure 1, designed for various purposes, including for the fisheries sector:

- acoustic protection of catches of fishing companies from marine mammals [5];
- automated search for fish clusters [5].

Figure 1. *Offshore crewless specialized platform [3].*

- complex measurement of water environment parameters [3];
- automated bathymetric survey (high-precision measurement of the seabed profile) [3].

In a previous study [5], it was assumed that the estimated cost of operating a specialized unmanned platform equipped with the necessary communication and control subsystems and a specialized hydroacoustic system is provided by a service crew of two specialists who can simultaneously control a group of two or more specialized unmanned platforms, and is no more than 0.998 thousand dollars per day.

In the Sakhalin region, the number of organizations by type of economic activity “Fishing and Fish farming” at the end of 2024 is more than 500 enterprises [8]. Based on the estimated fishing time of no more than 40 days per year and 10% of the potential market of fishing enterprises equipped with marine robotics, the projected average annual income of a research and production organization from the sale of innovative products will amount to 2,241. 3 thousand dollars.

Also, in a previous study [5], it was assumed that the introduction of technologies for the removal of marine mammals using specialized acoustic systems based on unmanned specialized platforms into the practice of fishing enterprises using the example of longline halibut fishing [4] brings an obvious economic effect of up to $ 5,243 per day or up to $ 209,720 per day during fishing 40 days. every ship.

Based on statistical data [8], the turnover of fishing and fish farming organizations in the Sakhalin region in 2024 amounted to 489,726.6 thousand dollars. With the minimum number of vessels involved in the catch, the fishing complex will be able to receive an estimated additional turnover in the total amount of 23,530.6 thousand dollars.

To further develop the implementation of innovative marine robotics products and deploy a monitoring system for the World's Oceans by 2030, including in the waters of the Far East, it is necessary to ensure the following conditions:

- investments;
- consultations on financing programs from development institutions and foundations;
- organization of partnership with potential consumers;
- organization of piloting innovative technologies in the Far Eastern region, in particular in the Sakhalin region;
- promotion of innovative products in the Asia-Pacific regions;
- informational promotion.

An important role in promoting innovative products in various sectors of the national economy is the cooperation of the scientific and production organization, the state and business, with subsequent access to the international level. To assess the effectiveness of entering new markets, it is planned to use SWOT analysis, which is a kind of roadmap that identifies advantages and disadvantages, potential opportunities and threats [9], as well as PEST analysis, BCG analysis and Customer Journey Map.

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从国际商业需求的角度看现代教育需求方法的融合

CONVERGENCE OF APPROACHES TO THE NEEDS OF MODERN EDUCATION FROM THE STANDPOINT OF INTERNATIONAL BUSINESS REQUIREMENTS

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摘要：作者分析了各国经济在全球化背景下复苏的持续变化，并探讨了各国主权复苏和技术主权强化的趋势。

关键词：俄罗斯、美国、中国、印度、欧盟、阿拉斯加、拉马克主义、联合国可持续发展目标、MIC、工业4.0、NBIKS技术、信息通信技术、主导地位、金砖国家、上合组织、欧亚经济联盟、北约、AUKUS、脱钩。

Abstract. *The author analyzes the ongoing transformations in the alter-globalistic recovery of national economies and examines trends in their sovereign recovery and strengthening of technological sovereignty.*

Keywords: Russia, USA, China, India, EU, Alaska, Lamarckism, UN SDGs, MIC, Industry 4.0., NBIKS technologies, ICT, dominance, BRICS, SCO, EAEU, NATO, AUKUS, decoupling.

Introduction

The objective of this study is based on the analysis of information on the harmonization of international relations, taking into account changes in the global interests of the leading world powers from the Arctic to the military-industrial complex, from space to the institutions of international law, trying to recreate the mechanisms of global security that have practically lost their significance after the beginning of Russia's SMO in Ukraine, with the beginning of a new destabilization of the Middle East in the "Palestinian issue", in the confrontation between Israel and Iran that emerged in the summer of 2025.

It is precisely the desire to prevent a nuclear Apocalypse, which became a reality after the launch of NATO's military-industrial complex capacities with the specified acceleration with the arrival of the new owner of the White House, who

insisted on increasing the allies' spending to 5% of their GDP for Uncle Sam's "nuclear umbrella" from the "bad Russians", uncontrollable Iran and China, which has become dangerous in alliance with the DPRK - all these are milestones in the reasoning of the "think tanks" of the West, which do not understand the world without the coordinate system of neocolonialism and are not ready to share our planet with anyone. [1;22] At the same time, the "global South", opposing such an approach through bloc, integration and military participation of various states in new models of defending their sovereignty, as well as national interests, has not yet become a formidable force, knowing the specific vulnerabilities of its former colonizers and metropolises, which have replaced human slavery with economic and technological. [2;8] It is for this reason that it is important to continue to address issues of education and training of new scientific personnel to overcome ignorance and solve the UN SDGs to find a harmonious future for all countries in the future.

Purpose of the study

The purpose of the study is to attempt to find a basic correspondence between ongoing geopolitical changes and the rate of transformation of the global military-industrial complex from the standpoint of readiness for local, regional or global conflicts. At the same time, the author examines educational trends and takes into account their impact on modern business.

Material and research methods

The study conducted by the authors included the databases of RIA Novosti, REGUL, ITAR-TASS, RBC, Military Review, Arguments and Facts, magazines Monocle, Forbes, Foreign Affairs, Techinsider, the Washington Post, Wall Street Journal, Fox News, CNN, Politico, Dawn Reforms, SIPRI, Heritage Foundation and Rand Corporation for the past 11 months and analyzed more than 32 sources, 10 of which are listed in the bibliography.

The task of communication between the two leaders according to the Alaskan agreements was reduced to very clear survival points for each living being, as part of an organism, waiting for evolutionary changes and depending on the significance of each acquired property of an organ or sensory system (vision, touch, hearing, etc.), giving a gap in movement and the expected speed in mimicry at the coming time of division according to the principle of viability and further demand. Such innovations can be associated with the continuation of the ideas of J.B. Lamarck, who had his own view on historical variability outside the framework of the general theory of C. Darwin - A. Wallace. Thus, his followers, such as S. Butler and E. Hering clarified the concept of "memory" as the emerging continuity between generations. Later, they also empirically tried to contrast somatic changes in human individuals, hominids, the class of primates, the evolution of behavior itself within the framework of classical tasks of reproduction of offspring, impos-

ing one's dominance on representatives of their societies/flocks and quenching the thirst of growing hunger - both from a biological and moral point of view on the path to improving the spirit and form of man himself: from genetic manipulations of genetic engineering, the genomic experiment of cerebral sorting and to prohibited eugenics. [3] At the same time, the ideas of J.B. Lamarck himself required further differentiation and it was E.D. Cope who separated the very tendency of the organism to progress and behavioral changes in the form of the so-called concept of "psycholamarckism", and the influence of the external aggressive environment on the somatology of organisms evolving over time and under stress - "mechanolamarckism". [3;9]

The works of V. Hecker himself were not crowned with success in his efforts to connect the inheritance of innate instinctive-hormonal forms of behavior in the conditions of narrowing possibilities of species diversity to the continuity of evolutionary acts of reproduction through the germ cells of parents who did not have time to consolidate the acquired experience in neurological and somatic changes in future generations. [4]

And this means that evolution is always wiser in the speed of inheritance and, according to F. Galton's "law of return", does not allow "children, and especially grandchildren, to inherit genius" and leadership of their family professions, clan preferences, and even further, country alliances [5], because another statistician-analyst of ongoing evolutionary changes, philosopher and writer Carlo Cipolla, deduced his "fundamental laws of human stupidity" [6]. And in them, as in F. Galton, there are the same sad results of the brain selection of fools and smart people, which "always and everywhere inevitably understate the number of fools in circulation." [3;10] In addition to discussions about the underground construction of a tunnel between Russia and America in Alaska [25], the leaders assessed the toxicity of the ongoing attempts to disperse the military-industrial complex of the "collective West" or to make NATO more powerful by preparing for an inevitable European war, with the involvement in AUKUS of both the "small Asian NATO," as well as Armenia and Azerbaijan in the form of the "small Caucasian NATO" being formed. It is precisely these irrepressible and time-infinite desires to harm Russia that are still just as stupid and untenable, since only nuclear powers, maintaining their national sovereignty under the yoke of global governance institutions, opposing the networks of netocrats, banksters and corporatocrats, can determine at least the form of further conflicts and their destructive asymmetry in various environments: from three natural (land, air, water) and classical environments-theaters of military operations (TMO) to cyber environments and to outer space vacuum with its carriers of potential bases for the use of weapons on new physical principles: asteroids, comets and the remains of cosmic bodies (stars, planets, space debris, etc.). [7;23] Against this background, the ever-increasing

policy of "controlled chaos" by the EU and the main customers of the "Ukrainian madness", the British, it is very important to precisely and clearly understand the algorithms launched against us by Stephen Mann and Jeanne Sharp, and their refined, mathematically precisely taken into account "features of jump-like evolution" by O. Shindwolf, N. Eldridge and S. Gould, as well as the stimulating factors of R. Thom as the development of foresight zoning for managing chains of constructed stages of escalation of the "non-linear revolution". It was their synchronous and multi-level use that was applied and actively used during the anti-De Gaulle student unrest in France, during the "Arab Springs" of the beginning of the current century, in the "color revolutions" that are still flourishing (the 3rd Lebanon War and the confrontation between Israel and Iran), which continue to be refined in practice through artificially generated popular unrest from outside in the vast expanses of the former USSR (in particular, in 2022 in Kazakhstan, in 2020 in Armenia and in 2025 in Azerbaijan) and in the Eurasian space, and in the entire Greater Eurasian Partnership (GEP). [16;18]

According to statistics from analysts at the Rand Corporation, who in the summer of 2025 switched to new formats of wars "Dispersed, Disguised, and Degradable", reflected in the title of their study in the form of a manifesto of a new type of confrontation in the 21st century through the use of "not just a battle", but a "climate of conflict", by imposing quickly dismantled and recreated structures of network fragments wandering in spaces (geophysical and virtual), as links in decentralization (taken by NATO from the practices of modern business processes in the field of flexible management to control distributed competencies and the emerging responsibility of each link in production and supply chains) [1;17]. All this should accumulate through the multiplier effects of invested funds and implemented technologies to involve potential enemies in the fight against "pressure points", suppressing which, he will choke and run out of steam, which becomes the result of the resulting synergy of disproportions in relation to the civilian population and the armed forces, who do not have time to coordinate with each other and solve the problems of survival, life support and ideological concentration of "theirs" against "theirs" [8;14].

This not only "controlled", but also invisibly imposed chaos "in dreams and in reality", by zombifying and removing weak strata of social society from the real fight with the enemy, has already been used by Anglo-Saxon funds (about 100 of them clearly worked to cleanse the "red Eurasian contour" in the 1990s) for the collapse of the USSR, and today has strengthened and grown to the size of 1200 funds/institutes/TNCs/banks, as a single ecosystem of a conglomerate of hostile elements with a single goal of tearing modern Russia apart and launching alternative neocolonial projects of the New and Old Worlds on its ruins. [9;15] To achieve this, it is very important to be prepared to respond to the increasingly com-

plex challenges of the “collective West” and to reconsider approaches to modern education practices that have long outgrown the formats of the Bologna Process and are increasingly focused on the specific results of the flow of personnel between various platforms, marketplaces and ecosystems of one-time or long-term foresight of ideas and cumulative useful content of the “knowledge economy” [9]. This means that the main decisions in matters of educating young generations will determine the agenda of leaders and all other actors in saturating them with specific knowledge and in developing practical skills (“smart skills”) in the “z” and “alpha” generations, introduced into circulation by Philip Kotler’s classification, and preparing comfortable conditions for the implementation of immersive technologies (a method of perception that creates the effect of immersion in an artificially created environment) (material and virtual worlds for the “beta” generation emerging from 2025), which, according to the emerging trash of “invisible but unchanging chaos,” will be able to decide the fate of all mankind with the development of the scientific and technological order in Industry 4.0 [5; 7]. It is the options for such solutions that will determine the possibilities for Russian secondary and higher education in approaches to determining the place of our society in the future, and will be able to form the basis for its unified ideological platform and for personnel preferences that take into account the problem of “blue collars” and the speed of the scientific and technological revolution. It is this that leads to increased disproportions between the rich and the poor, between the literate and poorly educated labor force of the Earth. Then the issues of the “brain drain” or “flight of unique personnel”, which are acute for almost all developed countries of our time, will receive their identification and form a request for the launch of mechanisms for the expected overcoming not only through material motivations, but also through the formulated tasks of the digital economy of an educational and patriotic nature, as is happening today in the PRC and in Israel, in India and Vietnam, and in the United States itself, confirming with its republican agenda the boundaries of “its greatness” and “superpower” [10]. In essence, we are talking about focusing on the implemented symbiosis of spirit and matter, multiplying critical and breakthrough technologies that form the platforms of Industry 4.0. and give each country a chance for its rightful place in the emerging new technological order. The Cape Town and Kazan declarations, previously adopted at the BRICS summits, can also become sources for a clear path to developing an ideologically verified social state. They clearly outline what kind of world and with whom we are building, what is alien and unacceptable for us, and what is being nurtured in plans from the standpoint of increasing the effectiveness of this business club, which is increasingly stretching to the role of an alternative space for conducting commodity-money and innovative-technological transformations of the countries of the “global South” and our coordinating participation.

It is necessary to evaluate the steps to distribute the growing risks of our colleagues in such a strategic partnership being built, who are not afraid of Donald Trump's sanctions and various types of sectoral and corporate duties and restrictions, who continue to buy our oil and gas, supplying us with a wide range of NBICS technologies, as well as the latest machine tools and robotic systems (80 joint investment projects for 20 trillion rubles). To do this, it is important to set goals for each of the actors included in the unified system of preparation and dissemination of knowledge between generations, to identify their hierarchy and continuity, to assess the reliability and relevance of the formation and development of cognitive measurement processes. The basis for such formation of "soft" and "professional" competencies for each actor, according to his profession or profile of the proposed activity, is a correlation analysis based on identifying the specified triggers of the growing problematic knowledge base and including foresight and assessment of the upcoming future challenges to humanity during the digital transformation. Such criteria can be the evaluation and analytical parameters of the sustainable and successful functioning of educational schools, academies and universities, which only in a limited number of countries combine academic civilian and military applied science and practice. [1;11]

The global trend in this aspect widely uses the approaches of Russell Ackoff, who identifies the process of accumulation and use of knowledge obtained by an individual as "identified trends or existing facts and phenomena contained within information." The latter is perceived by him as "a selected and ordered part of the database, processed (by the user, teacher, ideologist or psychologist) for subsequent use." And therefore knowledge can be explicit and implicit, which, in turn, "is recognized by the individual and expressed with the help of concepts and judgments (explicit knowledge)" or "is not reflective, based on personal experience, is not expressed in language, but is contained in it implicitly (tacit knowledge) [12]. Such division of knowledge within the information flow characterizes their application as normative/aberrative tendencies for descriptive possibilities for linking phenomena and facts, causes and effects, which become the basis for the formation of the information content of the actualized and constantly corrected management process. At the same time, various neural networks and neural algorithms provide the opportunity for their certain systematization and prognostic representation of various options for the development of events. They can arise in the role of either a dominant position of a kind of "creator", devoid of conventional frameworks in the flow of creative creation (including in line with the further development of creative industries of Daniel Kahneman's behavioral economics, as a given in the world of unbridled consumption and the triumph of irrational demands over common sense and over the moderation of using one's own resources (personality, company, state), or this becomes a role function of ensuring subordination and

slavish obedience of the "performer", in anticipation of a control effect, from the level of hierarchical change from the role of "creator" recognized by the system). [13;18].

Research results

It is precisely this approach that determines the development of education itself in the world of confrontation between neocon theories of Anglo-Saxon hegemony and alter-globalist ideas of bloc integration from the standpoint of the formation and strengthening of the countries of the "global South", as a historical analogue of the "third force" of non-aligned states in the era of the bipolar confrontation between the USSR and the USA. And the shoots of such continuity can and should be found in Russia's foreign policy, in its geopolitical agenda on issues of national sovereignty of countries, both those already collegially deciding issues of technological, food and energy security in resource unification zones (as stated in BRICS +), and within the boundaries of integration platforms that give multiplier effects in the synergy of interaction of national economies that are emerging from the control of global governance institutions. At the same time, the UN SDGs themselves, which emerged a quarter of a century ago, immortalized in their humanism and philanthropy towards a specific person, in the Millennium Declaration, are awaiting their country-specific correction from the standpoint of the 21st century agenda, which proclaimed the "dead end of the current model of capitalism," as V.V. Putin stated at one of the Valdai Forums, and are becoming sensitive to the use of alter-globalization mechanisms for the further development of international actors. They are the ones that increasingly fill the flow of ongoing processes of fragmentation of global supply chains and logistics flows, taking into account the regional tasks of hedging post-covid recovery of the economies of sovereign states, based on glocalization and further clustering at the meso-level of existing TNCs and industries of national economies in the process of increasing their integration degree of convergence (for example, as has been happening for almost 11 years in the EAEU) [14;22]. Russia, since 2024, through the Presidential Decree, has approved robotization itself as a national priority for its development and determined our movement into the Top 25 countries in this type of industrial improvement from 43rd place today by 2030, especially in the field of electronics, as well as in the automotive and food industries. For this, the Ministry of Industry and Trade of Russia is preparing a 20% subsidy for specialized enterprises and this is openly stated on the website of the State Innovation System of Industry (GISP), as an effective and timely mechanism for the unlimited expansion of technical and robotic production at enterprises preparing for personnel reform and the symbiosis of young specialists and "smart networks", the Internet of things, and virtual and augmented reality systems that create modern prototyping of necessary goods and services on 3-D printers, and mastering 5G + communication standards as the

basis for building a modern digital infrastructure. And here, delay is not only fatal, but also fraught with the fact that we can reach a point of no return, when all our national security systems, from the standpoint of key and critical competencies, remain in the hands of our adversaries or global competitors. Michael Bloomberg spoke about the same risks, and especially about the shortage of young and professional personnel, in his study in March 2025, calling it "a critical analysis of US defense technologies in an era of existential challenges" [16; 19] and called for a return to the original model of US hegemony, as the base of the existing incubator of all significant global innovations and unique patents [17]. However, China has unattainable patent leadership in AI and Big Data and is holding on in the race of digital transformations in the Second Chinese Technological Leap (running since February 2024) [2;20] is possible only from the standpoint of a rapid reform of the state defense order for the military-industrial complex and for space and... with a reform of the education of civilian and military personnel capable of quickly and specifically reorganizing their teams and retaining the required professional skills and unique competencies within the framework of grandiose projects to colonize the Moon and Mars or a "second atomic project" of comparable importance. This could soon be cold thermonuclear fusion (or its already ongoing replacement with stellarators, as the main drivers of high energy of the future instead of tokamaks) [21] or genetic engineering in matters of creating human beings with improved professional qualities, which the Celestial Empire is already officially carrying out as part of the reform of its National Liberation Army of China by 2027 [4; 23]. Both issues of education, and retention of qualified resources, and youth policy are becoming the main priorities and the basis for the revival of the sovereignty of states in their post-COVID recovery [16], a mandatory maneuver to build a single base of competencies and unique skills of the robotic-humanoid society of Industry 4.0. [17].

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能源运输走廊是上合组织地区地缘政治紧张的一个因素：从资源控制到路线控制
ENERGY-TRANSPORT CORRIDORS AS A FACTOR OF GEOPOLITICAL TENSION IN SCO SPACE: FROM CONTROL OVER RESOURCES TO CONTROL OVER ROUTES

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摘要：本文探讨了上海合作组织（SCO）地区地缘政治对抗的演变，即从对自然资源的竞争转向对运输路线控制权的争夺。研究涵盖了该地区的主要过境国，例如哈萨克斯坦、土库曼斯坦、吉尔吉斯斯坦、塔吉克斯坦、印度和巴基斯坦，并揭示了外国经济制裁、海上和陆上风险以及政治不稳定如何使交通基础设施面临压力。最后，本文得出结论，上合组织必须采取系统性措施，以确保过境基础设施的韧性和主权。

关键词：地缘政治、过境、上合组织、中亚、管道、运输走廊、能源安全、制裁、路线、海底电缆。

Abstract. *The article examines the transformation of geopolitical confrontations in the region of the Shanghai Cooperation Organization (SCO), the shift from competition over natural resources to the struggle for control over the routes of their transportation. The study covers the key transit countries of the region, such as Kazakhstan, Turkmenistan, Kyrgyzstan, Tajikistan, India and Pakistan, and demonstrates how foreign economic sanctions, maritime and overland risks, as well as political instability, turn transport infrastructure into an object of pressure. A conclusion is made about the necessity of systemic measures within the SCO to ensure the resilience and sovereignty of transit infrastructure.*

Keywords: *geopolitics, transit, SCO, Central Asia, pipelines, transport corridors, energy security, sanctions, routes, submarine cables.*

Introduction

Modern geoeconomics demonstrates a shift of emphasis from the extraction of energy resources to the provision of stable logistics routes. In the SCO region this is manifested with particular sharpness: states possessing natural resources are becoming ever more dependent on externally managed transit corridors.

As many political scientists note, including the author of the study "The development of energy-transport corridors in the Middle East serves both as a source of development and as a catalyst for regional conflicts" [Bocharov, 2024], this thesis-formula acquires special significance in the SCO space. Today it is not so much about ownership of deposits as about control over the routes of their transportation. For the countries of Central Asia, India and Pakistan, which depend on the transit of energy resources and goods, this becomes a matter of national security and economic survival.

Under conditions of increasing fragmentation of global logistics, the introduction of sanctions regimes and the militarization of transport hubs, energy-transport corridors acquire the status of a critically important element of national security. It is precisely this evolution from "resource dependence" to "route dependence" that is analyzed in the present study.

1. Kazakhstan: Between Opportunities and the Vulnerability of Oil Transit

Geoeconomic profile and export structure

Kazakhstan, possessing significant oil reserves, remains a country critically dependent on transit infrastructure. In 2023, oil export volumes reached 68.4 million tons. At the same time, about 80% was transported along routes passing through the territory of the Russian Federation. Another 12% went via the Trans-Caspian route and 8% through the Caspian Pipeline Consortium (CPC) towards Novorossiysk. The main importers of Kazakh oil are Italy (24%), the Netherlands (17%), China (15%), and France (12%), which indicates a high level of Kazakhstan's integration into European and Asian markets.

Treaty and institutional framework

Kazakhstan uses several key routes, each operating within intergovernmental agreements:

- **CPC (Caspian Pipeline Consortium)**, established in 1996, represents a 1,580 km oil pipeline, of which 1,210 km lie through Russian territory. The throughput capacity is 67 million tons per year, with the Russian Federation controlling 24% of the shares, Kazakhstan — 20% [KazMunayGas, 2023].
- **Atyrau — Samara**, created under the 1992 agreement, is controlled by the Russian side and has a capacity of up to 15 million tons annually.
- **Trans-Caspian International Transport Route**, integrated into Kazakhstan's multi-vector strategy, links the country with Turkey and Europe via the Caspian Sea, Azerbaijan, Georgia, and further — by land routes towards Turkey.

Risks, limitations, and prospects

Sanctions policy against Russia provoked a significant reduction in transit volumes. Thus, the reduction in throughput capacity via Novorossiysk led to direct

financial losses amounting to ≈ $3.2 billion. In addition, the costs of paying transit tariffs reach 8% of export revenues. Logistics risks manifest themselves in delays of up to two weeks, increased insurance premiums, and instability of the maritime component.

Against the background of rising tensions, Kazakhstan is actively investing in alternative routes. By 2030, it plans to expand the Trans-Caspian corridor to 15 million tons, as well as build the North Caspian pipeline to China, with a capacity of up to 20 million tons per year.

2. Turkmenistan: Gas Dependence and Strategic Vulnerability

Gas transport structure

The export of natural gas constitutes the foundation of Turkmenistan's energy balance. The primary destination is China, to which up to 40 billion m³ of gas per year is supplied via the Power of Siberia–2 pipeline. The Iranian route (12 billion m³) was suspended in 2023 due to non-payments. The TAPI project, which envisaged supplying gas to India and Pakistan, remains frozen due to regional instability [Ministry of Energy of Turkmenistan, 2023].

Turkmenistan has effectively found itself in a position of export mono-dependence on a single consumer — China — which makes the country vulnerable to changes in bilateral relations. The threats include not only financial but also geopolitical dependence.

3. Kyrgyzstan and Tajikistan: Isolation and Energy Fragmentation

Kyrgyzstan

The country is implementing the CASA-1000 project for transmitting electricity to Afghanistan and Pakistan with a capacity of 1,300 MW. However, the route depends on the stability of transit through Uzbekistan and the political situation in Afghanistan. [Ministry of Energy of the Kyrgyz Republic]

Tajikistan

Electricity exports from Tajikistan in 2023 amounted to 3.4 billion kWh, of which 70% passed through Uzbekistan. The absence of sea access and the need to use costly transit remain key problems. [Ministry of Energy of the Republic of Tajikistan]

Kyrgyzstan and Tajikistan represent so-called "energy islands" in the SCO space. Despite having their own export potential in hydropower, both states have no direct access to international markets. Electricity transmission is entirely dependent on transit through third countries — primarily Uzbekistan — as well as on political stability in importing countries (in particular, Afghanistan). A significant barrier also remains the lack of sea access, which makes any attempts to expand exports extremely costly from a logistics standpoint.

In addition, the high cost of overland transit, weak integration into regional energy networks, and limited technical capacities create the risk that these countries will remain on the periphery of Eurasian energy flows.

The fundamental problem for both states is structural infrastructure isolation combined with high politico-logistical vulnerability. Their energy development depends directly on the goodwill and stability of neighbors, which means — on multilateral mechanisms that provide transit guarantees and stimulate integration into the common SCO energy networks.

4. India and Pakistan: Maritime Vulnerability in a Zone of Global Turbulence

More than 85% of India's oil is imported, with the main routes being the Strait of Hormuz and the Suez Canal. A blockade of Hormuz, according to estimates, could lead to the loss of up to 35% of supplies, which would threaten the energy stability of the entire economy [The Hindu, 2023].

Pakistan's imports similarly account for 85% of its needs. At the same time, 20% of potential supplies via Iran are blocked due to U.S. sanctions, including the IP oil pipeline and the TAPI project [Dawn, 2023].

India and Pakistan are in a zone of high dependence on external supplies of energy resources, especially oil. More than 85% of the energy needs of both countries are met through imports, with the bulk of supplies transported via maritime routes. The main logistics nodes — the Strait of Hormuz, the Suez Canal, the ports of Karachi, Jamnagar, and others — are extremely vulnerable both from the perspective of military-political threats and under conditions of sanctions pressure.

Pakistan's problems are aggravated by the inability to implement key continental projects (such as the IP oil pipeline and TAPI) due to foreign policy restrictions. For India, an additional risk lies in the possibility of a naval blockade, the consequences of which could be catastrophic.

The key problem of India and Pakistan is the geopolitical vulnerability of maritime infrastructure and the limited availability of alternative supply sources. Given the rising instability in key waters, both countries need strategic diversification of routes and the formation of reliable alternative land corridors, where the SCO can serve as a platform for interaction and coordination. Reducing dependence on external routes requires institutional support and a transition from unilateral decisions to collective transport and energy strategies.

5. Transport Corridors of SCO Countries: Logistics Vulnerability and Dependence on Neighbors

5.1 Kazakhstan: The "Railway and Highway Backbone" of Eurasia

Railway routes

- The main flow of cargo goes along the Trans-Kazakhstan Mainline (TKM) and further via Atyrau — Astrakhan — Volgograd to Russia;
- **Chinese corridor:** two operational railway lines pass through Khorgos and Alashankou; a third — Ayagoz — Bakhtu — is under construction (launch in 2027).

Critical dependence: more than 60% of Kazakhstan's export cargo (coal, metals, grain) is transported along these two routes.

Highways and pipeline corridors

- The *Western Europe — Western China* (WE-WC) highway crosses the entire territory of Kazakhstan, but its use is limited by border checkpoint capacities in Russia and China;
- Pipelines: 15,255 km of gas pipelines and 8,015 km of oil pipelines are connected with Russia and China, but pass through Kazakhstan's oil and gas regions, making them vulnerable to internal and external risks.

Risks

- Sanctions against Russia (2022–2024) led to an increase in transit times by 10–14 days and a 15–20% increase in logistics costs;
- Checkpoint congestion: in 2023 alone, the queue at the "Khorgos" border reached 7 km.

5.2 Turkmenistan: The "Dead-End Transit Branch"

Railways

- The Trans-Asian Railway (TRACECA) — the only route to Europe through Uzbekistan and the Caspian — has limited capacity (up to 5 million tons/year);
- **Chinese direction:** through Kazakhstan (railway "Turkmenistan — Kazakhstan — China") — the only alternative outlet.

Risks

- The absence of seaports makes the country fully dependent on transit through Uzbekistan and Kazakhstan;
- **Political risks:** any sanctions or political conflicts in Uzbekistan could paralyze exports.

5.3 Kyrgyzstan and Tajikistan: "Blocked Mountain Republics"

Railways

- Kyrgyzstan: only 427 km of railways, connected with Kazakhstan and Uzbekistan;
- Tajikistan: 680 km of railways, but all routes pass through Uzbekistan.

Road routes

- The Pamir Highway (M41) is the only road connecting Tajikistan with China, but it is closed in winter;
- Kyrgyzstan: the "Bishkek — Osh — Khorog" route passes through the territory of Uzbekistan and Tajikistan.

Risks

- **Geographical blockade:** the lack of sea access and mountainous terrain limit alternative routes;

- **Political disagreements:** in 2022, Uzbekistan temporarily suspended the transit of goods to Tajikistan due to a border conflict, which led to shortages of food and fuel in southern Tajikistan.

5.4 India and Pakistan: "Maritime Gateways and Reliability"

India: The main flow of imported goods passes through the ports of Mumbai and Kandla, but 70% of cargo arrives by sea through the Strait of Hormuz and the Suez Canal, making logistics vulnerable to blockades.

Pakistan: Karachi and Gwadar are the main ports, but all land routes to Central Asia pass through Afghanistan and Iran, which are associated with security risks and political instability.

6. Analytical conclusion on transport corridors

The countries of Central Asia and the recently joined SCO members India and Pakistan have found themselves "hostages" to transit infrastructure. All key routes (railways, highways, pipelines) pass through the territory of neighbors, creating three main risks:

1. **Political sanctions and conflicts** — any disagreements between transit countries can paralyze exports/imports;
2. **Infrastructure overload** — limited capacity leads to delays and higher costs;
3. **Geographical blockade** — the lack of sea access for Kyrgyzstan, Tajikistan, and Turkmenistan makes them entirely dependent on land routes.

In the context of the growing fragmentation of global supply chains, transport corridors are becoming a new field of geopolitical struggle, while SCO countries are both objects of pressure and hostages to logistics.

In SCO countries, a general trend is emerging: export and energy dependence is determined not so much by the availability of resources as by the complexity and vulnerability of transport routes. Kazakhstan and Turkmenistan are hostages to limited routing and sanctions risks. India and Pakistan are potential victims of a maritime blockade. Kyrgyzstan and Tajikistan are isolated energy islands.

7. Conclusion: Findings and Proposals

The current realities of international relations increasingly clearly demonstrate: the resilience of states in the 21st century is determined not only by the volumes of energy resources they possess, but also by their ability to ensure reliable, protected, and politically neutral transit. Energy-transport corridors are no longer merely logistical arteries, but the most important elements of geo-economic architecture, around which alliances, coalitions, and lines of conflict are formed.

In the SCO space, transit dependence is becoming a systemic challenge. Almost all member countries of the organization, regardless of the scale of their economies and their position on the map, to one degree or another depend on external transport routes and international regulatory conditions. At the same time,

the existing threats — sanctions pressure, political instability, the limited number of alternative routes, as well as growing risks in cyberspace — sharpen the need for collective responses and coordinated strategies.

Energy-transport corridors in the SCO space are losing their function as purely economic infrastructure and are increasingly turning into an instrument of geo-economic pressure. The strengthening of sanctions pressure, the growth of instability along certain segments of transport routes, the fragmentation of global logistics, and the militarization of key nodes create a stable trend toward increased vulnerability of energy-transport systems. This requires not ad hoc solutions, but a systemic, strategically calibrated approach by all SCO member states.

Given the significant differences among SCO countries — in levels of economic development, types of political systems, foreign policy priorities, and infrastructure accessibility — the following becomes clear: the only foundation for sustainable interaction in the energy and logistics spheres can be economic pragmatism. This means an approach based on principles of mutual benefit, transparency, technological compatibility, and neutrality in the development and operation of transport solutions.

To implement this approach, it is important not to limit ourselves to declarations. As practical and priority areas of scientific, expert, and political cooperation within the SCO, the following can be proposed:

- **Creation of an SCO Energy Union** — an institutional coordination platform aimed at developing common rules for the transit of energy resources, harmonizing tariff policies, and collectively responding to sanctions restrictions;
- **Development of the "transit immunity" principle** — a prohibition on unilateral restrictive measures against transit infrastructure, implemented through multilateral treaty mechanisms;
- **Formation of a joint cybersecurity system** — to protect both aboveground and underwater infrastructure from external interference, including under conditions of hybrid threats;
- **Diversification of routes and transport links**, especially through the expansion and deepening of the "Middle Corridor" projects (China — Central Asia — Caspian — Caucasus — Turkey) as a sustainable alternative to excessive dependence on a single direction.

These measures can and should become the subject of constant coordination and development, including with the participation of scientific and expert communities of SCO member states, which will make it possible to mitigate the consequences of crisis phenomena, ensure strategic resilience, and strengthen regional stability.

Analytical View: The SCO and the Middle East Experience — Possible Points of Convergence

In our opinion, within the framework of developing a long-term strategy to respond to new geopolitical challenges, the analytical community of SCO countries faces an important task: a comprehensive study of situations that arise around energy corridors beyond their own borders — primarily in the Middle East.

Despite differences in historical experience, political models, and international alliances, SCO countries and Middle Eastern states share a number of intersections that can become the basis for scientific dialogue and political forecasting:

- **Shared involvement in global energy supply chains**, in which external actors such as the USA, EU, China, and Russia dominate.
- **Similarity of geopolitical risks** — from the blockade of maritime straits and attacks on oil pipelines (both by various terrorist structures and by opposition-minded armed formations seeking recognition) to the destruction of submarine cable infrastructure in conditions of regional conflicts.
- **The influence of sanctions policy** and extra-economic levers of pressure on energy logistics projects.
- **Mental proximity of certain communities**, in which value-based and religious-cultural foundations of worldview, trust, and diplomacy still play a significant role.

As the experience of conflicts in the Middle East has shown (in particular, around the Strait of Hormuz, the sabotage of submarine cables in the Red Sea, and attacks on oil pipelines and oil refining facilities in the region), the instability of transport routes can cause not only economic shocks but also intensify the political fragmentation of entire regions. Studying how Middle Eastern countries — with their unique history and political specifics — attempt to build stable energy communications can provide valuable lessons for SCO states.

Moreover, analyzing these cases will make it possible to develop alternative models of interaction that avoid the logic of confrontation characteristic of parts of the Middle Eastern space and, on the contrary, focus on mutual benefit, stability, and technological integration.

Thus, it is proposed to consider the issue of security and development of energy-transport corridors not in isolation by region, but in the format of a trans-regional study. In our view, this direction deserves inclusion in the agenda of analytical centers, strategic commissions, and expert communities within the SCO as a basis for forming a more flexible, adaptive, and sustainable transport architecture of Greater Eurasia.

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俄罗斯与土耳其数字合作的地缘政治方面
GEOPOLITICAL ASPECTS OF THE DIGITAL COOPERATION BETWEEN RUSSIA AND TURKEY

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注释：本文探讨了俄罗斯与土耳其在信息通信技术（ICT）领域的合作前景。目前，安卡拉正在采取一系列措施提升其数字化潜力，但其对西方的依赖仍然很高，包括在资源供应、基础设施、网络空间和信息认知领域。鉴于俄罗斯现有的能力和独特的经验，它可以成为土耳其在维护其数字主权方面的可靠合作伙伴。在该领域进一步开展双边合作将使俄罗斯自身受益。开启此类合作的一个重要条件是土耳其领导层的政治意愿。

关键词：数字地缘政治、土耳其、信息安全、人工智能、数字化转型、ICT、地理数字空间、北约。

Annotation. *The article examines the prospects for cooperation between Russia and Turkey in the field of information and communication technologies (ICT). Currently, Ankara is taking a set of measures to increase its digital potential, but its dependence on the West remains very high, including at the levels of resource provision, infrastructure, cybersphere and information-cognitive field. Russia, given its existing competencies and unique experience, could become a reliable partner for Turkey in ensuring its digital sovereignty. Further bilateral cooperation in this area would be beneficial for Russia itself. An important condition for the beginning of such cooperation is the presence of political will on the part of the Turkish leadership.*

Keywords: *digital geopolitics, Turkey, information security, artificial intelligence, digital transformation, ICT, geodigital space, NATO.*

In the last two decades, Turkey's foreign policy has become more active. Ankara is making its presence felt in the Syrian direction and the Middle East as a whole, in Libya, Transcaucasia, Central Asia, the Balkans, is making mediation efforts, including for the purpose of settling the conflict in Ukraine, and is increasing cooperation with African and Latin American countries, and the states of Southeast Asia.

At the same time, the Turkish leadership is increasingly realizing that, in the context of significant changes in the world caused by digital transformation,

strengthening the country's position as one of the regional leaders with the potential to influence individual global processes depends on its innovative development and, above all, ensuring digital sovereignty.

The importance of this issue is demonstrated by the national Strategy for Technological and Industrial Development until 2030, published in March 2025, among whose priorities the digital agenda occupies an important place. The document proposes, first of all, to qualitatively strengthen the country's potential in such areas as artificial intelligence (AI), cloud and quantum computing, distributed ledger (blockchain), the Internet of Things, virtual and augmented reality, 5G communications and - in the future - 6G, etc., relying on the implementation of national solutionsMoreover, the Turkish side demonstrates a comprehensive approach, which involves expanding competencies not only at the cyber level, that is, in terms of developing its own software. It also concerns resources, including the extraction of minerals and secure supply chains (especially rare earth and other precious metals needed for the digital sphere), improving infrastructure, including the construction of data processing centers (DPC), laying telecommunication fiber-optic cables, creating a satellite communications constellation for a promising national geo-positioning system, building enterprises for the production of semiconductors and microchip printing, etc., training qualified personnel and stimulating R & D, as well as "technological diplomacy", which is designed to establish interaction between Turkey and other countries to export its goods and obtain the necessary technologies and investments from abroad. Ankara has already achieved some successes – the creation of its first quantum computer, the introduction of the e-government platform "e-Devlet" and the healthcare platform "e-Nabız", the use of AI in unmanned aerial vehicles, the growth of the gaming industry, fintech, etc.

Despite the presence of such ambitious plans outlined in the Strategy, their implementation depends on many factors, in particular, financial stability in the country against the backdrop of a difficult socio-economic situation, the domestic political situation, the geopolitical situation in the region and the world, as well as the will of the Turkish government. The latter is associated with the country's membership in NATO and its continuing desire to join the European Union. Thus, Turkey remains an important part of the Euro-Atlantic world with well-known foreign policy priorities and commitments. Meanwhile, ensuring Ankara's digital sovereignty seems impossible without reducing its dependence in this area on the United States and the collective West as a whole. On the contrary, in a number of important areas - the creation of data centers, AI training centers, the introduction of "cloud" technologies - further deepening of relations between Turkey and its NATO allies is expected.

This dependence can be traced at various levels of resources, infrastructure, cybersphere (in other words, various types of software) and the information-cog-

nitive field. Intertwined, they form a geo-digital space, linking together physical (analog) and virtual-informational realities.

1. When it comes to resources, in Turkey we are mostly talking about energy, electricity, human resources development and data usage. Of course, Ankara has as a priority the improvement of the educational system and professional training of specialists in high-tech areas, however, according to various Turkish experts, among modern youth the priority is still to receive a Western education, including in ICT areas, given the not very strong domestic mathematical school. Turks often look for opportunities to study in the USA or Europe, after which many stay there to work. However, graduates of local universities – representatives of such specialties as "electronics", "engineering mathematics" and "engineering informatics" – often leave the country. The outflow has been observed both among specialists and from scientific circles since about 2015.Moreover, this trend may gain momentum against the backdrop of, as noted, the difficult economic situation in the country.

As for data, it is akin to fuel not only in modern economic life, but also in a broader sense of public life. In 2024, Turkish MPs, mainly representing the ruling Justice and Development Party, pointed out the need to take measures to protect the personal data of Turkish citizens from exploitation by Western digital platforms, as well as to create opportunities for the country's own use of big data generated for technological progress and innovative development of the economy.

2. The existing digital infrastructure facilities in the country are in one way or another dependent on Western digital corporations, especially data centers. The development of the latter, as well as cloud computing, quantum technologies, and production capabilities for creating a component base in Turkey are associated with international assistance, which is openly stated in the same Technological and Industrial Development Strategy.

3. The "superstructure" over the infrastructure is the cyber sphere. In Turkey, national software is being developed with a special focus on cybersecurity and AI – that is, those areas in which the Turkish authorities provide assistance to local economic entities. However, there is still not a single ecosystem company that would provide a wide range of services – from "messenger" and "video hosting" to online trade, leisure, education or other services, work, etc., in other words, so that such software would cover the maximum share of the population. Most of the existing platforms are focused on one area (trade, food delivery, finance, online cinema, etc.). At the same time, the situation with social interaction platforms is extremely difficult – dependence on the West is significant here. For example, in ascending order, the social network "X" of the American entrepreneur E. Musk is used by about 20 million Turkish citizens (24% of the population), "Facebook", which is banned in Russia, is used by 34 million (40%), and "Instagram" is used

by about 60 million (70%, according to this indicator, the country is among the top five world leaders), and the “video hosting” “YouTube”, which belongs to “Google”, is used by 57 million (67%). The dominant “messenger” is “WhatsApp”, which is also banned in Russia “Meta”.

4. As a consequence, at the level of the information-cognitive field, Western ICT corporations skillfully use the dominance of their digital platforms to influence the minds of the population, gradually “reprogramming” their cultural and civilizational code. For this purpose, special algorithms are used for content recommendations, moderation of news messages, publication of contextual advertising, issuance of results in search engines, generation of audiovisual or text products by neural networks. At the same time, a large number of participants creating information are directly or indirectly involved in such work - from huge media corporations, public and scientific organizations to individual users who themselves are unaware of it. At the same time, the role of the latter has grown dramatically over the past twenty years: now most of the content is created by ordinary citizens.

Thus, a system is being built in Turkey, where corporations tied to Western non-universal values and political attitudes use software to promote the agenda they need, and users, gradually falling under such informational influence, actively (through the creation of similar materials, “likes”, forwarding) or passively (by inflating views) contribute to the dissemination and expansion of the volume of biased content.

In the context of Turkish realities, a good example was the meeting of the Digital Platforms Committee of the Grand National Assembly of Turkey (Parliament) in January 2025 together with representatives of Netflix. An analysis of their discussion shows that Turkish MPs are seriously concerned about the “content” of the films shown to local residents on this platform, especially their political narratives and the lifestyle they promote - often alien to Islamic culture. Particular attention was drawn to “pro-Greek” and “pro-Israeli” series, in which certain events are presented in a way that contradicts Ankara’s national interests. In addition, MPs are very concerned about the propaganda of LGBT (banned in Russia as an extremist organization) in many Western series. Despite statements from Netflix representatives that this content is released with the “18+” label, the Turkish side was clearly not satisfied with this answer.However, local authorities have few effective means of protection, and the closure of a popular platform could cause public discontent (for example, restricting the operation of the Instagram platform for a week in August 2024 led to grumbling among users and losses of small and medium-sized businesses, according to some estimates, in the amount of $500 million).

Against this background, Russia and Turkey have good opportunities for developing mutually beneficial strategic cooperation in the ICT sector.

Firstly, our countries have good experience in implementing the most important bilateral initiatives. We are talking about the construction of pipeline systems for the export of natural gas “Blue Stream” and “Turkish Stream”, the construction of the Akkuyu Nuclear Power Plant - one of the largest investment projects in the history of Turkey, the supply of the S-400 “Triumph” anti-aircraft missile system. It is worth noting that the last two examples are also high-tech areas, not to mention the fact that the presence of a nuclear power plant actually creates a whole new industry in the country and provides huge energy generating capacities needed for the same data centers and AI training centers. This indicates, at a minimum, that there is a sufficient level of trust between the parties for mutually beneficial partnership in new areas.

Secondly, individual Russian digital companies are already represented on the Turkish market with their solutions, including in the field of information security, business development, automation of management systems, work with personnel, leisure, and in general various types of software. Such giants as Kaspersky Lab and Yandex are actively working here. The latter provides a whole range of services, including a search engine, maps and navigation, an application for calling a taxi, services for placing advertisements, etc. Moreover, according to representatives of Yandex itself, in the coming years this business entity plans to invest about 400 million US dollars in business development in Turkey, especially in strengthening the infrastructure.

Thirdly, Moscow can find a partner in Ankara to further expand its digital positions in the region, given Turkey’s important geographical position. Ankara will be able to rely on a reliable global digital actor. For Turkey, Russia would be an alternative to cooperation with other global digital actors in ensuring its digital sovereignty. We have a strong mathematical school, a developed system of personnel training (including a state scholarship program), a good industrial base, and our own effective technologies. Of no small importance is our country’s unique experience in countering hybrid threats emanating from criminal groups and unfriendly states in the context of the Special Military Operation (SMO).

Due to the dependence of many major digital powers on the United States, including the EU, Japan, the Republic of Korea, and Australia, interaction with them, although useful in terms of commercial interests, will not bring Turkey closer to digital independence, and Ankara’s relations with India, which is gaining digital power, are not simply due to the special nature of its ties with Islamabad. At the same time, the experience of the CIS shows that any country that somehow displeases the West can be disconnected from digital services for political reasons, or even have its access to the Internet completely restricted, for example, through the root servers of the Domain Name System or the website security certification system. Turkey has already experienced the effects of sanctions from its NATO

ally, the United States, for purchasing the S-400 air defense system. Meanwhile, these countries still have many contradictions on other issues.

And that is precisely why it is in the interests of both Moscow and Ankara that the Turkish leadership, despite possible external pressure from the West, demonstrates the political will to launch bilateral strategic cooperation in the digital sphere.

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S. Marshak 诗歌翻译：传统与原创

POETIC TRANSLATIONS OF S. MARSHAK: TRADITIONS AND ORIGINALITY

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摘要：本文阐述了S. 马沙克翻译作品所依据的关键原则。文中列举了来自不同国家和文化的诗人作品，展现了译者S. 马沙克对民族思想和创造力的深刻理解。文章强调，S. 马沙克始终保持着原创性。

关键词：民间传说，原创，歌曲，民谣，诗歌词汇，儿童诗。

Abstract. *The article presents the key provisions on which S. Marshak based his translation work. Examples are given from the works of poets from different countries and cultures, demonstrating the deep penetration into the national thinking and creativity of their translator, S. Marshak. It is emphasized that S. Marshak remained an original author.*

Keywords: *folklore, original, song, ballad, poetic vocabulary, children's poetry.*

The study of national models of the world, comprehended as a spiritual unity in the richness and diversity of options, requires a language at the junction of scientific and artistic thinking. E. Yu. Sidorov, a Soviet and Russian literary critic, rightly wrote about this.

D. Likhachev, G. Gachev and other researchers spoke about the philosophical perception of national cultures as an organic, historically conditioned phenom-

enon. This theory was intensively developed in the fields of ethnoecology, ethnopsychology, and ethnoculture.

A special place in the artistic space of S. Ya. Marshak's translations is occupied by what can be defined as the theme of spirituality, in the solution of which the triad "East-West-Russia" is visible. It is based on the existence of two almost polar areas of his creative interest in the spiritual and moral sense, containing scientific, cultural and ontological meaning. Moreover, taking into account some characteristic features of the writer's worldview, this antithesis in his works serves as a tool that conveys the author's creative thought to a specific reader. The altruism of S. Ya. Marshak reconciles the "Western" and "Eastern" perceptions of the world in his best works. Two constantly emerging themes of reflection dominate alternately and pose questions to researchers about the objective meaning of all of Marshak's work. Each era has its favorite songs. This is also true for translations. One generation, replacing another, chooses from the treasury of world poetry what resonates most with it. The success of romantic German and English ballads at the beginning of the 19th century among Russian readers was explained by the high merits of V. A. Zhukovsky's translations. Several decades later, songs by P. Zh. Beranger appeared in Russia, superbly translated by V. Kurochkin. The songs of R. Burns, the sonnets of W. Shakespeare, thanks to Marshak's translations, became "facts of Russian poetry. If we are talking about translations of Shakespeare's and Burns's lyrics, we feel, just as in the poems of Beranger, translated by Kurochkin, all the charm of the personality of each of these poets and many signs of the national identity of their poetry. The measure of any artistic translation is, first of all, accuracy. But concern for the literal transmission of the word does not yet give the translation broad rights and, as V. Bryusov noted, can often even turn into betrayal, distorting the meaning and spirit of the work. Such literal translators as I.S. Turgenev in his article about the Russian translation of Faust compared it to children who, "measuring with a compass and ruler the distance from the eye to the lips in their drawing and in the original, are surprised that they have done it wrong" [3: 44]. Where fidelity to the original is combined with the spirit of creativity and following the letter of the translation does not become a dogma, does not restrict the creative freedom of the artist, does not turn the translator into a prisoner of a foreign language. The translation acquires the characteristics of an original work. In such works, the poet-translator is imbued with the spirit of the original, as if re-experiencing the original. The verses are colored by his personality, without which the verse will inevitably turn out to be insipid and sluggish, a mechanical copy of the original. But if the poet-translator cannot completely exclude his individuality, then he has no right to suppress the personality of the author. It is all about the artistic sense of proportion, the ability to merge one's thoughts and feelings with the thoughts and feelings of the poet being translated,

while maintaining one's own attitude towards him. Starting from details and particulars, from the whole, he gains that necessary creative freedom which ensures the greatest authenticity of the translation.

Following the traditions of the Russian translation school, S. Ya. Marshak the translator always strives to create corresponding Russian poems that are perceived as original works, sound Russian and at the same time remain English, Scottish, German, Hungarian poems - poems of Shakespeare and Blake, Burns, Browning, Heine, Petofi. Among those translated by Marshak are poets of Georgia, Lithuania, Latvia, Finland, Norway, Czechoslovakia, Mongolia and other countries and peoples. Many of the poet's fairy tales in verse are original authorial adaptations of Georgian, Armenian, Uzbek folklore texts. It is worth noting that many of S. Marshak's translations, starting from the late 1950s, became the textual basis for musical works - the most popular Russian songs, ballads, romances, created by composers of different levels and trends - from Georgy Sviridov (a cycle of songs and romances from Robert Burns) to Alexander Gradsky (R. Burns "In the fields, under snow and rain ...") and others. The texts of these songs and other poems-translations of S. Marshak are aphoristic, performed not only by professional musicians, but also live in the artistic consciousness, aesthetic memory of the people, quoted by them organically, without awareness of the authorship of the words, which is a sign of true nationality. This also applies to the idiomatic expression "All the King's Men", which gave the name to the Russian translation of Robert P. Warren's novel. This phrase has independent circulation, when there is not even an association with the translation by S. Marshak from English children's poetry that "generated" it:

All the king's horse,
All the king's men
Can't Humpty,
Can't Dumpty
Humpty Dumpty gather … [1: 84].

The title of J. D. Salinger's novel "The Catcher in the Rye" contains a reminiscence of Marshak's translation of R. Burns' poem "Walking to the Gate in the Rye at Night". All this testifies to the deep dialogism of S. Marshak's translation texts, which in turn became a source of precedent texts for subsequent works. In his work on the translation of the cycle of beautiful, subtle humorous poetic miniatures by the Abkhaz Dmitry Gulia "In Our Village", Marshak faced a different task. Another era, another people, a different structure of speech. But in the translation we again feel the peculiarities of the national character, the charm of the national language, conveyed by Russian verse:

It takes an hour to go down to the spring,
Then an hour to climb up,

And an hour to get water, bending down,
And an hour to rest, returning...

So far away was
That spring,
That ran under our mountain [2: 509].

In the lines of the poem "Spring", in its special rhythm, one can clearly discern the lively, emotional speech of the highlanders, the inhabitants of a small Abkhazian village. In "Khorovod", a collection of Czech children's nursery rhymes, created on different ethno-poetic material, the playful grace of a Czech children's folk song lives:

Is it possible for goats not to butt,
If they have horns?
And for girls not to dance,
If they have legs? [1:196].

From the treasury of world poetry, Marshak selects what is close to him as an artist, what directly resonates with his own poems. In any case, knowing the creative path of the poet, his long-standing attention to folklore, it is easy to explain the interest of Marshak the translator in English and Scottish folk ballads, from which the road leads directly to Shakespeare and Burns, it is easy to explain the lasting interest in the folk muse Petofi in her very spirit, and the remarkable Belarusian poet Frantisek Bogushevich. The bitter and tender "Lullaby" of Bogushevich, speaking of the most secret feelings of the Belarusian people, has the right to take its rightful place in world poetry, along with such poems as Shakespeare's sonnets or Burns's songs and ballads. As we have already noted, Marshak often turned to fairy tales and legends of other peoples - Georgian, Czech, Mongolian, Latvian, Norwegian. It seems to be no coincidence that it was Marshak who introduced the Russian reader to the poems of the Italian poet Gianni Rodari. Marshak loves the taste, color, and smells of various crafts. In the laconic manner inherent in the poetry of the same Marshak, using precise details, Rodari, for example, tells what crafts smell like. Marshak liked many things in Rodari's poetry: the fact that the Italian poet also drew on folk counting rhymes and riddles, and the fact that in his poems he strives to teach his young fellow citizens the concepts of "peace", "freedom", "labor". The funny and the serious are skillfully combined in "A Verse about the Summer Heat and City Kids". With great cordiality and tenderness towards children, the poet writes in these verses that if he were elected president, he would strictly forbid the children of his country to live in cities in the summer and would give them the Alps.

All of Marshak's translations contain that creative freedom necessary for an artist, which has already been discussed. It sometimes allows for deviations from the letter, but not from the spirit of the original.

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书面表达英语单元音的字母及其组合
LETTERS AND THEIR COMBINATIONS REPRESENTING ENGLISH MONOPHTHONGS IN WRITING

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摘要：本文旨在研究俄罗斯联邦教育机构英语课堂中教师在教学活动中出现的英语元音（单元音）的图形拼写问题。作者指出了构成这些音素的主要图形拼写方式，即字母、字母组合以及一些非正字法符号（撇号）。

关键词：教学活动、英语、图形拼写、单元音、教师、元音。

Abstract. *The article is devoted to the study of the problem of graphic spelling of English vowel sounds (monophthongs) in educational activities of pedagogical workers in English classes at educational institutions in the Russian Federation. The author identifies the main ways of graphic spelling of the phonemes, namely letters, combinations of letters and a few non-orthographical marks (apostrophy) used in the formation of the sounds in question.*

Keywords: *educational activities, English, graphic spelling, monophthongs, pedagogical worker, vowels.*

In English classes, we observed the students experience phonetic and spelling problems while learning English words containing one and the same letter or a combination of the same letters pronounced differently in definite cases, e.g. the vowel letter *a* in the following words: *after – [a:], age – [eɪ], ago – [ə], all – [o:], ant – [æ], Bologna – [jə], climate – [ɪ], parent – [εə], watch – [ɔ]*; the combination of vowel and consonant letters *our: sour – [sauə], tumour – [ə], courtesy – [3:], concourse – [o:], tour – [uə];* the combination of consonant letters *ch*, e.g. *chef – [ʃ], chess – [tʃ], chorus – [k], sandwich – [dʒ].*

The relevance of the research work arose in the background of insufficient coverage of the declared topic in the educational process carried out by individual entrepreneurs in the Russian Federation. Initially, the introductory [10], introductory and phonetic courses [6], English phonetics [15] and phonology manuals [14], [20] did not allow us to find irrefragable answers to all questions of the students

regarding the multiple ways of graphical spelling of vowel and consonant phonemes. That demand prompted us to study the problem thouroughly.

The material of the research work consisted of various texts taken for our consideration from pieces of literature, periodicals, the Internet. We also dealt with business correspondence, films, advertising; explanatory [5], [7], [17] and on-line dictionaries [11], [12], [13]; guides to contemporary English pronunciation [16], [18], [19]. We examined the parts of speech and their transformations regarding tense, voice, number, case, degree, mood categories. It seemed natural for us to view abbreviations, acronyms, interjections and loan words, paying particular attention to such toponyms [3] as the names of cities, continents, countries, days of the week, months, nationalities, people's names, patronymics and sur-names, rivers, salads, social networks, seas, stars, states, wines, etc. In this article, we endeavour to compile and systematize the ways of graphical spelling of 10 monophthonhs [2], [4], [6] omitting other vowel and consonant sounds [9], [10].

Vowel sound [Λ] can be represented by English letters *o* (e.g., *dozen [ˈdΛzn]*), *u* (*thus [ðΛs]*), *w (WTO [dΛblju:ti:ˈəʊ])* and by groups of letters *oe* (*does [dΛz]*), *oo* (*blood [blΛd]*), *ou* (*double [ˈdΛbl*), *uh* (*uh-huh [ΛˈhΛ])* or *[ʊˈhʊ]*). Sound [Λ] can be put in the opening (*oven [ˈΛvn]* or *[ˈΛvən]*) and central (*flood [flΛd]*) position of lexical units. One does not meet it in the neutral and ending position of lexical units. Monophthong [Λ] is represented by two vowel letters (*o, u)*, one consonant letter *(w*), three groups of vowel letters (*oe, oo, ou*). In one case, this phoneme is made in graphic spelling by a group of a vowel and a consonant letters (*uh*).

Vowel sound [a:] can be represented by letters *a* (*disater [dɪzˈa:stə]*), *e* (*ensemble [a:nˈsa:mbl]*), *r* (*R&D [a:(r)ənˈdi:]*) and by groups of letters *ah* (*Ah [a:]*), *al* (*almond [ˈa:mənd]*), *ar* (*arc [a:k]), are* (*aren't [ˈa:nt]*), *arre* (*bizarre [bɪˈza:]*), *au* (*laugh [la:f]*), *ear* (*hearth [ha:θ]*), *er* (*sergeant [ˈsa:dʒənt]*), *ir* (*memoir [memˈwa:]), oi* (*turquoise [ˈtə:kwa:z]), ois* (*bourgeois [ˈbuəʒwa:]), uar (guard [ga:d])*. Sound [a:] can be put in the neutral (*Ah [a:]*), opening (*ask [a:sk]*), central (*barley [ˈba:lɪ]*) and ending (spa *[spa:]*) position of lexical units. Monophthong [a:] is represented by two vowel letters (*a*, *e)*, one consonant letter *(r*) and 12 groups of letters (*Ah, al*, *ar, are, arre, au, ear, er, ir, oi, ois, uar*). In two cases, this phoneme is made in graphic spelling by groups of vowel letters (*au, oi*), in ten cases by groups of vowel and consonant letters (*Ah, al*, *ar, are, arre, ear, er, ir, ois, uar*).

Vowel sound [ɪ] can be represented by letters *a* (*image [ˈɪmɪdʒ]*), *e* (*depart [dɪˈpa:t]), e* or *i* (*enquire/inquire [ɪnˈkwaɪə]), i* (*inlet [ˈɪnlet]*), *o* (*women [ˈwɪmɪn]*), *u* (*busy [ˈbɪzɪ]*), *y* (*hymn [hɪm]*), by French letter *é* (*protégé [ˈprɔtɪʒeɪ]*) and by groups of the letters *ae* (*palaeontology [pælɪənˈtɔlədʒɪ]), ai* (*fountain [ˈfauntɪn]*), *ay* (*Friday [ˈfraɪdɪ]*), *ea* (*Guinea [ˈgɪnɪ]*), *ee* (*yankee [ˈjæŋkɪ]*), *ehea* (*forehead [ˈfɔrɪd]*), *ei* (*forfeit [ˈfo:fɪt]*), *eig* (*sovereign [ˈsovərɪn]*), *eo* (*pigeon [ˈpɪdʒɪn]* or

[ˈpɪdʒən]), *ey* (*kidney [ˈkɪdnɪ]*), *ia* (*marriage [ˈmærɪdʒ]*), *ie* (*kerchief [ˈkəːtʃɪf]*), *ui* (*guild [gɪld]*), *wi* (*Greenwich [ˈgrɪnɪdʒ]*). Sound [ɪ] can be put in the opening (*ink [ɪŋk]*), central (*climate [ˈklaɪmɪt]*) and ending (*plenty [ˈplentɪ]*) position of lexical units. One does not meet it in the neutral position.

Vowel sound [ɔ] can be represented by letters *a* (*wrath [rɔθ]*), *e* (*entrepreneur [ɔntrəprəˈnəː]* or *[aːntrəprəˈnəː]*), *o* (*inoculate [ɪˈnɔkjuleɪt*) and by groups of letters *ach* (*yacht [jɔt]*), *au* (*sausage [ˈsɔsɪdʒ]*), *ea* (*Sean [ʃɔn]), ho* (*honest [ˈɔnɪst]), oh* (*John [dʒɔn]*), *ou* (*lough [lɔh]*), *ow* (*knowledge [ˈnɔlɪdʒ]).* Sound [ɔ] can be put in the opening (*onto [ˈɔntuː]*) and central (*pond [pɔnd]*) position of lexical units. One does not meet it in the neutral and ending position of lexical units.

Vowel sound [oː] can be represented by letters *a* (*gall [goːl]*), *o* (*sanatorium [sænəˈtoːrɪəm]*) and by groups of letters *al* (*stalk [stoːk]*), *aor* (*extraordinary [ɪksˈtroːdənərɪ]*), *ar* (*swarm [swoːm]), au* (*taunt [toːnt]*), *augh* (*naught [noːt]), aw* (*thaw [θoː]), awe* (*awesome [ˈoːsəm]), hau* (*haut* or *haute [oːt]*), *oa* (*broad [broːd]), oar* (*hoard [hoːd]), oor (floor [floː]), or* (*enforce [ɪnˈfoːs]), ore* (*pore [poː]*), *orps* (*corps [koː]*), *ort* (*rapport [ræˈpoː]*), *ough* (*ought [oːt]*), *our* (*four [foː]*), *wor* (*sword [soːd]*). Sound [oː] can be put in the neutral (*or [oː]*), opening (*all [oːl]*), central (*walk [woːk]*) and ending (*door [doː]*) position of lexical units.

Vowel sound [ʊ] can be represented by letters *o* (bosom *[ˈbʊzəm]), u* (*bull [bʊl]*) and by groups of letters *oo (*nook *[nʊk]), ou (haute couture [əʊtkʊˈtjʊə]), oul (should [ʃʊd])*. Sound [ʊ] can be put in the opening *(Ugh [ʊh])* and central (*butcher [ˈbʊtʃə]*) position of lexical units. One does not meet it in the neutral and ending position of lexical units.

Vowel sound [æ] can be represented by letters *a* (*acrid [ˈækrɪd]*), *i* (*meringue [məˈræŋ]*) and by groups of letters *ai* (*plait [plæt]*), *a'a* (*ma'am [mæm]*), *ua* (*guarantee [gærənˈtiː]*). Sound [æ] can be put in the opening (*act [ækt]*), central (*pad [pæd]*) and ending (*Nah* or *Nahh [næ]*) position of lexical units. One does not meet it in the neutral position.

Vowel sound [e] can be represented by letters *a* (*ate [et]* or *[eɪt]*), *e (peril [ˈperəl]), u (bury [ˈberɪ]), f (FOB [efəʊˈbiː]), l (LTD [eltiːˈdiː]), m (BMW [biːemˈdʌbljuː]), n (NGO [endʒiːˈəʊ]), s (SOS [esəʊˈes]), x* (x-ray *[ˈeksreɪ]*), *z* (ZT *[zedˈtiː]*), by French letter *é* (*apéritif [əˈperətiːf]*) and by groups of letters *ai* (*said [sed]*), *ea* (*pleather [ˈpleðə]*), *eg* (*phlegm [flem]*), *ei* (*leisure [ˈleʒə]*), *eo* (*jeopardize [ˈdʒepədaɪz]*), *ie* (*friend [frend]*), *ue* (*baguette [bæˈget]*). Sound [e] can be put in the opening (*embassy [ˈembəsɪ]*) and central (*twenty [ˈtwentɪ]*) position of words. One does not meet it in the neutral and ending position of lexical units.

Vowel sound [əː] can be represented by groups of letters *ieu* (*milieu [ˈmɪljəː]*), *ear* (*pearl [pəːl]*), *eor* (*George [dʒəːdʒ]*), *er* (*tertiary [ˈtəːfərɪ]*), *ere* (*were [wəː]*), *err (inferred [ɪnˈfəːd]), eur* (*amateur [ˈæmətəː]* or *[ˈæmətə]*), *ir* (*dirge [dəːdʒ]*),

olo (*colonel [ˈkəːnəl]*), *or* (*attorney [əˈtəːnɪ]*), *our* (*courtesy [ˈkəːtəsɪ]*), *ur* (*nocturnal [nɔkˈtəːnəl]).* Sound [ə:] can be put in the neutral (*Er [əː]*), opening (*earnest [ˈəːnɪst]*), central (*hurt [ˈhəːt]*) and ending (*infer [ɪnˈfəː]*) position of lexical units.

Vowel sound [ə] can be represented by letters *a* (*abrupt [əˈbrʌpt]*), *e* (*fraudulent [ˈfroːdjələnt]*), *i* (*principal [ˈprɪnsəpl]*), *o* (*custody [ˈkʌstədɪ]*), *u* (*focus [ˈfəʊkəs]*) and by groups of letters *ai* (*villain [ˈvɪlən]*), *ar* (*leopard [ˈlepəd]*), *ay* (*always [ˈoːlwəz]* or *[ˈoːlweɪz]*), *ea* (*sergeant [ˈsaːdʒənt]*), *eo* (*sturgeon [ˈstəːdʒən]*), *eou* (*outrageous [autˈreɪdʒəs]*), *er* (*southern [ˈsʌðən]*), *er* or *re* (*fibre* or *fiber [ˈfaɪbə]*), *eu* (*pasteurize [ˈpæstʃəraɪz]*), *eur* (*chauffeur [ˈʃəʊfə]* or *[ˈʃəʊfəː]*), *gh (Edinburgh [ˈedɪnb(ə)rə]*), *hu* (*sorghum [ˈsoːgəm]*), *ia* (*initial [ɪˈnɪʃəl]*), *ie* (*sufficient [səˈfɪʃənt]*), *io* (*tension [ˈtenʃən]*), *iou* (*vicious [ˈvɪʃəs]*), *iour* (*saviour [ˈseɪvjə]*), *iu* (*premium [ˈpriːmjəm]* or *[ˈpriːmɪəm]*), *oar* (*cupboard [ˈkʌbəd]*), *oi (tortoise [ˈtoːtəs]), or* (*tailor [ˈteɪlə]*), *ou* (*ominous [ˈɔmɪnəs]*), *ough* (*thorough [ˈθʌrə]*), *o(u)r* (*vigour* or *vigor [ˈvɪgə]*), *re* (*macabre [məˈkaːbə]* or *[məˈkaːbr]*), *ue* (*guerilla [gəˈrɪlə]*), *uer* (*lacquer [ˈlækə]*), *uor* (*liquor [ˈlɪkə]*), *ur* (*surmountable [səˈmauntəbl]*), *ure* (*torture [ˈtoːtʃə]*), *wer* (*answer [ˈaːnsə]*), by a combination of the apostrophe (‘), a consonant and a vowel letters *‘re* (*we’re [ˈwɪə]*), a vowel letter and the apostrophe *o’ (o’clock [əˈklɔk]).* Sound [ə] can be put in the opening (*about [əˈbaut]*), central (*tenant [ˈtenənt]*), central and ending simultaneously (*opera [ˈopərə]*) and ending (*clever [ˈklevə]*) position of lexical units. One does not meet it in the neutral position. Monophthong [ə] is represented by five letters (*a, e, i, o, u*), by 30 groups of letters (*ai, ar, ay, ea, eo, eou, er, eu, eur, gh, hu, ia, ie, io, iou, iour, iu, oar, oi, or, ou, ough, o(u)r, re, ue, uer, uor, ur, ure, wer*), by one group of consonant letters (*gh*), by one combination of a punctuation sign (the apostrophe), a consonant and a vowel letters (*‘re*) and by one combination of a vowel letter and a punctuation sign (the apostrophe) (*o‘*). In 14 cases, this phoneme is made in graphic spelling by groups of vowel letters (*ai, ay, ea, eo, eou, eu, ia, ie, io, iou, iu, oi, ou, ue*), in 15 cases by a group of vowel and consonant letters (*ar, er, eur, hu, iour, oar, or, ough, o(u)r, re, uer, uor, ur, ure, wer*), in one case by a group of consonant letters (*gh).*

The results of the scientific analysis persuade us that the presented material can be effective in the educational process rendered by teachers at educational institutions and organizations carrying out education when explaining the articulation of English phonemes via graphic spelling of letters and their combinations to students. Demonstrating the data of the study to learners can facilitate their understanding the problem of English alphabet letter combinations representing the sounds used in the formation of lexical units [1] while practicing the pronunciation [19]. We assume that the ways of graphic spelling of the phonemes presented by us are not exhaustive because it is impossible to cover the whole spectrum of the English language due to its constant development.

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英国和美国条约序言的精神空间
MENTAL SPACES OF THE UK AND USA TREATIES PREAMBLE

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摘要：本文旨在通过英美两国与各国签订的条约，探讨国际法律交流的语言和认知特征。作者建议运用心理空间理论来分析这些文书的文本。作者认为，条约序言的每一段都通过特定的连接词，在国际法律话语中引入了一个新的心理空间或概念语义空间，并包含了成功沟通的背景信息。

关键词：认知模型、条约、序言、心理空间、连接词、话语、术语。

Abstract. *The article is devoted to the identification of linguistic and cognitive features of international legal communication by means of the treaties of the UK and USA with various states. The author suggests using the theory of mental spaces to analyze the texts of the instruments. The author claims that each paragraph of the treaty preamble introduces a new mental or conceptual-semantic space in the international legal discourse by means of a specific connector and contains background information for successful communication.*

Keywords: *Cognitive model, Treaty, preamble, mental space, connector, discourse, term.*

An international agreement is an important outcome of interstate communication with the interpretation of the information flow being in the limelight. The nature of interpretation is a mental procedure where a certain expression, a fragment of current knowledge, was linked to previous, subsequent expressions of the text or the concept under consideration, as well as to the interpreter's changing fund of knowledge [Demyankov 1989: 6].

The dynamic nature of interpretation, which consists in overlapping parallel hypotheses on the text, was also noted by L.M. Alekseeva [Alekseeva 2013: 28]. Moreover, each hypothesis is based on the mental state of a person at a particular moment in the communication process. Such a mental state is given a spatial configuration in cognitive research.

V.V. Nalimov believed that the geometrization of our representations is the main feature of consciousness [Nalimov 1989: 227]. The spatial model of fragments of the world is derived from discourse [Cherneyko 2018: 138].

Processing of the text and non-text elements, the understanding of the text is carried out within the mental space in the consciousness of the communicator [Manerko 2013: 106].

The current discursive or mental space is supposed to be shared by the speaker and the listener as the basis for the developing discourse. Thus, each subsequent proposition updates the current discursive space in some way [Langacker 2008:59].

Undoubtedly, for any communication to be successful it is necessary that the parties should have something in common. D. B. Gudkov noted the need for a presupposition as a common cognitive foundation and a zone of the communicators' cognitive spaces intersection [Gudkov 2017: 23]. In the process of communication, during the production, perception and understanding of messages, the cognitive spaces of the interaction participants are actualized and partially overlap, generating a common presuppositional fund, while the larger the intersection zone is, the more adequate the communication [Kulikova 2022: 27].

The pragmatic characteristics of the treaty discourse are reflected in the preamble terminology. A. Aust believed that not only the preamble introduces background information, but also reflects the main text of the document [Aust 2007:426]. The researcher believed that from a legal point of view, it is sufficient to designate the preamble of a treaty as follows: *The Parties to this Agreement, ... have agreed as follows...* However, the subject and predicate of a given sentence are usually separated by one or more participial phrase, which are separate paragraphs with propositional content.

In spite of the legal significance of the preamble, in our opinion, each treaty preamble paragraph introduces a common to the parties new mental or conceptual-semantic space into the discourse, laying the foundation for successful communication. We believe that the preamble of a treaty best indicates that the discourse of the agreement is situated at the intersection of the parties' mental spaces.

Describing the essence of mental spaces, J. Fauconnier postulated that mental spaces are created and structured by cognitive models, and externally connected by connectors of various types [Fauconnier 1997: 39]. The researcher considers participial phrases to be presuppositional (reflecting prior knowledge) constructions [Fauconnier 1997: 60].

The mental spaces of the preamble are introduced and operate in the treaty discourse through presuppositional connectors represented by special terms used in a circumstantial form, in the form of participles. They include terminological units recorded in the English-Russian legal dictionary: the verbs of perception *consider*

(from a legal point of view), *believe* - "to assume (reasonably or erroneously)", *recognize* – "to give an obligation in court", "to give a pledge (with surety)", "to give a word (in a meeting)", *acknowledge* - "to confirm authenticity", *note* – "to take note", *recall* - "to cancel, revoke, demand back, cancel", *stress* - "to seize property, to emphasize", *resolve* - "to make a decision, to resolve", *determine* - "to define, establish, resolve, resolve (dispute), terminate", as well as the terms of the English-Russian political dictionary *wish* and *be desirous* in the meaning of wish, *strive* – "to make efforts", *convince* - "to assure", etc.. These verbs are used at the beginning of each paragraph of the preamble in the circumstantial form of the active or passive participle.

The classical connector is a verb term has a participle form, which plays the role of a circumstance characterizing the main action in the text: *Considering* "taking into account", *Recognizing*, *Acknowledging, Noting, Wishing, Recalling*, *Stressing, Underlining*, *Striving*, *taking account of*, *Being* or a form of the passive participle: *Convinced*, *Resolved, Determined*.

J. Lakoff identified five types of mental spaces that refer to the past, present, future, subject area, and hypothetical situation [Lakoff 2011: 281]. So, the paragraphs of the English-language treaties preambles act to the full extent as mental spaces.

For example, in an excerpt from the preamble of the agreement on Britain's withdrawal from the European Union, we observe several conceptual and semantic spaces. The first one is introduced by the verb *Considering* "taking into account", it concerns the results of the referendum in the UK and refers to past events, the second one is introduced by *Wishing*, concerns future measures, that is, establishing the procedure for withdrawing from the agreement, the third one is introduced by the *Recognizing* connector, it concerns the present state of affairs, protecting the rights of member states' citizens who are the parties to the agreement.

THE EUROPEAN UNION and THE UNITED KINGDOM OF GREAT BRITAIN

CONSIDERING that on 29 March 2017 the United Kingdom of Great Britain and Northern Ireland ("United Kingdom"), following the outcome of a referendum held in the United Kingdom

WISHING to set out the arrangements for the withdrawal of the United Kingdom from the Union and Euratom,

RECOGNISING that it is necessary to provide reciprocal protection for Union citizens and for United Kingdom nationals, as well as their respective family members,

HAVE AGREED AS FOLLOWS: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/862063/TS3202_1.PDF]

Thus, the legal discourse includes conceptual elements: the referendum held in the UK, the legal regulation of Britain's exit from the EU, and measures to protect citizens' rights.

The national and cultural nature of terminology, represented by presuppositional connectors of the mental spaces of the preamble, is reflected by stylistic and grammatical means: passive constructions, perfect forms, elliptical forms.

A series of the US treaties with various states on social protection issues begins as follows: *The Government of the United States of America and the Government of State2, Hereinafter referred to as "the Contracting States,"*

Being desirous of regulating the relationship between their two countries in the field of Social Security, have agreed as follows:… This preamble introduces a mental space using *being desirous* as a connector.

Similar connectors are found in another treaty. The treaty on social assistance between the UK and Chilie entered into force on January 1, 2015. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/465359/TS_27_Chile_Soc_Cm_9137_Web_Acc.pdf]. There are three paragraphs in its preamble two of which begin as *Desirous of promoting the welfare of people; Desirous of ensuring that individuals from both countries enjoy equal rights.*

The connectors of mental spaces are *(being) desirous*, which are considered to be elliptical constructions whereas there is no ellipsis in the preamble of the US treaties, the connector is *being desirous* "desiring". The ellipsis in the preamble of the Great Britain-Chile treaty is a stylistic means to spare one's strength. The similar succinct preamble of the US treaties explains the desire for brevity.

Another common elliptical form acting as a connector can be the term *mindful* used without verb be which in the legal dictionary means "intending, having an opinion" [LingvoUniversal 2011: Electronic resource]. *The parties MINDFUL that activities must be undertaken with a view to protecting the environment Have agreed as follows:* This structure is presented in the UK-US Energy Policy treaty. [https://www.state.gov/wp-content/uploads/2021/04/20-1231-United-Kingdom-Nuclear-Energy-Peaceful-Uses.pdf].

It should be noted that more complex grammatical forms sometimes act as connectors of mental spaces. The treaty between the UK and Ireland entered into force on December 31, 2020. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/959112/TS_6.2021_UK_Ireland_Convention_on_Social_Security.pdf]. In the preamble of this agreement, perfect participles and the terms of political dictionary *Having then strengthened*, *Having subsequently consolidated* and *Having resolved* act as connectors and introduce mental spaces related to the past, to the long and fruitful history of relationships.

The convergence of the States-Parties legal systems helps to design the mental spaces of the negotiators effectively by means of culturally specific, best-chosen terminology in the international agreement.

The nationally specific mental spaces introduced by the preamble reflect existing legislation, relate to the past or to a narrow subject area.

The national and cultural specifics of the connectors terminology of the treaty preamble is reflected by grammatical and stylistic means, the use of perfect tenses to denote an actual regulation, repetitions and ellipsis, used to secure the efforts of the drafters, who tend to get down to a discussion of mutual obligations without aiming at the aesthetics of the preamble.

The success of interstate negotiations depends on the degree of similarity in the construction of mental spatial configurations carried out by the parties. Thus, an international agreement is a product of joint communication, the parties confirm that their mental spaces have similar features, reflected in the preamble of the instrument.

Some treaties do not have a preamble with extended participial phrases. The lack of shared mental spaces is explained by the novelty of the field, where there is currently no long history of relationships and references to the past.

The main pragmatic purpose of the preamble, which is the cognitive background for the provisions of the treaty, is to describe the commonality of the parties and outline the objectives of the treaty.

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公共关系与声誉管理：大学形象塑造的理论与方法论视角
PUBLIC RELATIONS AND REPUTATION MANAGEMENT: THEORETICAL AND METHODOLOGICAL PERSPECTIVES ON UNIVERSITY IMAGE FORMATION

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摘要：本文探讨了公共关系 （PR） 在塑造高等教育机构 （HEI） 形象和声誉方面的作用。声誉被认为是影响招生、教师参与、研究合作和资金投入的关键战略资产。本研究借鉴牛津大学、斯坦福大学、苏黎世联邦理工学院和清华大学等全球案例，并结合印度尼西亚、印度、俄罗斯和乌兹别克斯坦的国家视角，展示了战略性公共关系如何提升知名度和竞争力。乌兹别克斯坦自独立以来的改革凸显了公共关系和品牌建设对于国际融合日益增长的重要性。分析得出的结论是，高等教育中的公共关系超越了宣传，它是一种基于真实性、透明度和利益相关者参与的声誉管理方法论工具。

关键词：高等教育、公共关系、声誉、机构形象、排名、乌兹别克斯坦。

Abstract. *This article examines the role of public relations (PR) in shaping the image and reputation of higher education institutions (HEIs). Reputation is recognized as a key strategic asset influencing student recruitment, faculty engagement, research partnerships, and funding. Drawing on global examples such as Oxford, Stanford, ETH Zurich, and Tsinghua, as well as national perspectives from Indonesia, India, Russia, and Uzbekistan, the study shows how strategic PR enhances visibility and competitiveness. In Uzbekistan, reforms since independence highlight the growing importance of PR and branding for international integration. The analysis concludes that PR in higher education goes beyond publicity—it is a methodological tool for reputation management based on authenticity, transparency, and stakeholder engagement.*

Keywords: *higher education, public relations, reputation, institutional image, rankings, Uzbekistan.*

Universities worldwide recognize that reputation – the public's perception of their quality – is a critical strategic asset (CIPR, n.d.; Bailey, 2024). A strong reputation signals trust and excellence to prospective students, faculty, industry, and

funders. Public relations (PR) is fundamentally about managing this reputation: as the CIPR notes, "Public Relations is about reputation – the result of what you do, what you say and what others say about you… the planned and sustained effort to establish and maintain goodwill and mutual understanding between an organisation and its publics" (CIPR, n.d.). In practice, a positive university image boosts student applications, attracts research collaborations and donors, and improves employment outcomes for graduates. Global ranking systems themselves embed reputation measures heavily (often 40–50% of a score comes from academic and employer surveys), which further motivates universities to actively manage their image. As Rafique et al. (2023) observe, global ranking frameworks "provide the foundation for competing in this global era" – in other words, PR and communication efforts are now integral to institutional strategy and competitiveness.

Leading universities employ a range of strategic PR practices to project their strengths. They emphasize research and innovation (e.g., publicizing breakthroughs like new technologies or Nobel-winning work) and celebrate alumni success, thus creating compelling narratives of impact. They maintain sophisticated digital engagement (active websites, virtual tours, social media channels) so that prospective students worldwide can readily access information and feel connected. For example, research on RUDN University notes that an "extremely competitive" education market forces top institutions to adopt open communication policies, including robust social media practices, to reach young audiences (Glagoleva, Zemskaya, Kuznetsova, & Kachesova, 2020). Social networks are now key platforms for humanizing the university brand and generating word-of-mouth support.

Storytelling and visibility are central: universities highlight major achievements in news releases and multimedia campaigns. Oxford, Stanford, ETH Zurich, and others regularly publicize their high-profile research, interdisciplinary initiatives, and partnerships to reinforce a narrative of excellence and tradition (Simpson, 2011). These stories are disseminated through global media and social platforms to shape a positive public image.

Institutions also monitor and respond to ranking criteria. As Rafique et al. (2023) note, international ranking systems play a vital role in enabling universities to compete globally. Universities therefore track metrics (like citation impact or internationalization) and highlight improvements in these areas. A rise in rankings often becomes a PR tool itself, with institutions issuing press releases when they climb league tables.

Stakeholder engagement is another core dimension. Universities actively cultivate relationships with alumni, employers, government, and communities. For instance, many run alumni networks that publicize graduate achievements and organize public lectures or community projects to show social impact. Crucially,

modern PR is two-way: institutions also listen and respond to stakeholder feedback (through surveys, town halls, or social media Q&A), which helps build the mutual understanding that PR aims for (CIPR, n.d.; Bailey, 2024).

Only about 45% of private universities in one Indonesian region had a formal PR office as of 2023, underscoring how PR is still emerging in many institutions (Universitas Tarumanagara, 2023). Nevertheless, education authorities now emphasize PR as a key driver of reputation. In a recent forum, Indonesia's Higher Education Service head remarked that PR "determines the success of key performance indicators to improve the reputation of a university," noting that effective media and technology-based communications are crucial (Universitas Tarumanagara, 2023).

In India's vast higher education sector, many colleges – especially smaller or rural ones – have historically neglected formal PR. Research indicates that "many institutes have not yet understood the real importance of PR" (Dhanwatay, 2019). Those that do engage in PR focus on alumni relations and local outreach. As Indian institutions compete for top students and funding, metropolitan universities increasingly adopt modern marketing (education fairs, websites, social media) to stand out. However, PR maturity varies widely: some institutions only rely on word-of-mouth, while top colleges now routinely communicate their innovations and placements through press and online platforms.

Russian universities have made PR a strategic priority, often linked to national goals of global competitiveness. Scholars note that purposeful promotion of Russian universities only began in earnest in the 21st century, such as via the "5-100" excellence program (Ebzeeva & Smirnova, 2022). Today, many elite Russian institutions use PR to raise their international profile: for example, a case study of RUDN University showed concerted social-media marketing increased the university's visibility and engagement metrics (Glagoleva et al., 2020).

Since independence, Uzbekistan's higher education system has undergone major reforms (Ruziev & Burkhanov, 2018). While PR was nascent in the 1990s, today Uzbek universities are increasingly embracing modern branding and communication. Scholars such as Abdullayev (2020) emphasize that universities must develop strong information services to meet stakeholder needs and manage their image effectively. Observers argue that building strong university brands and engaging stakeholders through PR are becoming essential for Uzbek universities to compete globally (Zufarova, 2024).

In conclusion, reputation is a strategic asset for universities and PR is its management tool. Institutions with strong, well-communicated brands enjoy better student recruitment, funding, partnerships, and societal support. The best practice is to ground PR efforts in genuine strengths – excellent research, teaching outcomes, and societal contributions – and then convey those authentically to the public. As

CIPR and PR scholars emphasize, the end goal of PR is mutual understanding and goodwill (CIPR, n.d.; Bailey, 2024), not just headline figures. Indeed, experts caution that superficial metric-chasing without real substance can backfire: China's recent research reforms, for example, have been criticized as "little more than [a] PR exercise" to placate public opinion (Lem, 2022).

For Uzbekistan and other emerging systems, the lesson is clear: adopting global PR practices can amplify real progress. By building a coherent narrative of their mission and achievements, and by engaging stakeholders through modern channels, universities turn their latent strengths into a visible reputation. When done ethically and based on actual quality, PR becomes a virtuous cycle – helping universities attract talent and resources, which in turn further strengthens their performance and reputation.

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科学与宗教的知识与信仰
KNOWLEDGE AND FAITH IN SCIENCE AND RELIGION

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摘要：本文分析了科学与宗教中知识与信仰的关系。认为知识是信仰的必要元素，信仰是一种认识论现象和心理状态。然而，宗教信仰不仅指对上帝存在的认知，也指对上帝作为造物主和救世主的绝对信任。认为哲学家和科学家“相信”他们假设和假定的真实性，如同相信上帝一样，是错误的。

关键词：知识、信仰、科学、宗教、科学假设、真理。

Abstract. *The article analyzes the relationship between knowledge and faith in science and religion. It is argued that knowledge is a necessary element of faith as an epistemological phenomenon and a psychological state. Yet religious faith is not only knowledge of the existence of God, but also absolute trust in Him as creator and Savior. It would be a mistake to assume that a philosopher and a scientist “believe” in the truth of their hypotheses and assumptions in the same sense that they believe in God.*

Keywords: *knowledge, faith, science, religion, scientific hypotheses, truth.*

Ordinary “faith” is understood as accepting the truth of statements without sufficient evidence, while “knowledge” is considered as the content of statements which truth has been proven, confirmed, and justified.

The definition of faith as knowledge that cannot be proved rationally and empirically does not correspond to the essence of knowledge itself, which, as a recognized true image of reality, cannot in principle be “unprovable”. The recognition of the ideal image of an object existing outside the consciousness of the cognizing subject as true requires a foundation, which can only be a substantive and practical contact with this object [3].

By saying “I believe” a person expresses his confidence in the truth of what another person claims, yet at the same time he does not know whether this person’s statements are really true, i.e. correspond to the reality he is talking about. But knowledge always characterizes one’s own consciousness in its relation to being. If a person does not know something, does not have ideas about the object under

discussion confirmed by his own experience, then what motivates him to believe another person?

We can believe in what another person says only because we believe the person himself. When one person says to another "I believe you" he does not mean accepting the truth of statements without proof, but recognizing that the person who is believed has passed the "trust test" in the process of living together with someone who believes him without requiring proof of the truth of each statements. This means that faith in the truth of another person's statements is always based on the knowledge that this person can be trusted, that his previous statements have been tested for truth more than once and turned out to be true.

By saying "I believe you" a person expresses his trust in another person, his confidence in another person truthfulness, even if what that person claims may turn out to be false. For someone who trusts, as well as for the speaker himself, the falsity of the statement will mean only a delusion, but not conscious deception, not deceit. This is of fundamental importance in interpersonal relationships, since a person is doomed to make mistakes, and makes mistakes not only when he believes in the truth of other people's statements without requiring proof, but also when he believes those who seem to have evidence of their own statements, such as supporters of geocentrism, phlogiston, ether and other ideas that turned out to be false.

Only "blind faith" is accepting the truth of other people's statements without knowing these people's real deeds. At the ordinary level of consciousness, "blind faith" is perceived as an unreasonable attitude towards people, and from a religious point of view, it is seen as a path leading to superstition or apostasy.

So, if I believe another person, then I know something about that person that allows me to believe him. Only the knowledge of the previous confirmation of the truth of a person's statements gives me reason to accept as true those statements that are being made at the moment.

Religious faith has nothing to do with believing "in anything" as it seems to people who say "Everyone believes in something". However, as an ideal phenomenon, as an element of consciousness, faith has the same socio-psychological features, whether it is faith in God or faith in another person. Faith in God is not just the knowledge of His existence and the truth of God's Word, but also the realization of the indissoluble connection of God's creation with his Creator. A believer has a deeply personal relationship with God and believes God precisely because He knows of His love for His creation.

The opinion that "faith" exists in science and philosophy in the same sense as in religion [5] is based on two misconceptions: on the understanding of religious faith as an unsubstantiated acceptance of the existence of God as true, on the one hand, and on the identification of scientific ontological assumptions, postulates and hypotheses with this understanding of religious faith, on the other hand.

The absence of knowledge about the essence of the object being studied is the starting point of any cognitive process. But putting forward hypotheses does not mean believing in their truth. This means assuming the possible truth of a hypothesis that may not be confirmed. The very epistemological essence of a hypothesis is the doubt of its truth or the assumption of its possible falsity.

At the same time, the assumption of the truth of axioms (initial principles or postulates of a theory) is not an act of faith, but a necessary element of the formalization (axiomatization) of the theory, which is not related to the verification of this theory for compliance with reality.

The statement of the fact, known since the time of Aristotle, of accepting the basic assumptions of scientific knowledge without evidence does not explain why some assumptions are accepted as true, while others are rejected?

One can give a theoretical justification to anything. It depends only on whether the truth of the basis on which the proof of the truth of a particular statement is based is recognized. That is why what is provable in one axiomatic system turns out to be unprovable in another.

However, in scientific cognition only what is related to already substantiated, proven, confirmed laws and theories or based on a solid foundation of empirical data is accepted as ontological assumptions or hypotheses. Scientists never rely on ignorance in order to put forward a hypothesis that will further expand the scope of the unknown.

Hypotheses are put forward in order for ignorance to be replaced by knowledge. And a hypothesis is not an acceptance of the truth of a statement without proof, but an assumption about the existence of certain phenomena of reality based on data from experimental practice and already known laws.

To assume does not mean to believe in the truth. To assume means not knowing what the object under study really is. And only those hypotheses that have received practical, empirical justification are recognized as true.

Ontological assumptions differ from hypotheses in that they underlie the theoretical proof of the consistency of hypotheses. However, ontological assumptions are an "object of faith" only in the sense that their truth, in principle, cannot be substantiated within the framework of the system of statements on which these assumptions are based [1].

In an effort to identify the epistemological specifics of religious knowledge, it is necessary to take into account that the essence of knowledge remains unchanged, no matter what object of knowledge is discussed. Therefore, if we assume that a person "reasons according to the religious type when he accepts a certain idea as unshakable and super-valuable" [4, p. 12], then we will have to admit that there is no other knowledge than religious knowledge at all, because any idea recognized by the cognizing subject as true, is "unshakable and super-valuable"

for him [2; 3]. With this approach, Copernicus' main work "On the Rotations of the Celestial Spheres" would have to be considered as religious sermon, yet not because Copernicus believed in God, but because he created the heliocentric system only to preserve the "unshakable and super-valuable" for him the idea of the uniform circular motion of the planets.

In fact, religious consciousness is imbued with only one idea: the idea of a direct living connection with God, and the desire to live according to His commandments. No ideas that are not related to the thought of God have a religious meaning. But God Himself is not an idea, but the Creator of all things and the Savior of a sinful person from death.

All those who take "on faith" the suggestions of political strategists, the prevailing opinions in the media or information from unverified sources, reason not according to the "religious type", but according to the type of unreason, recklessness and superstition, strongly condemned by the Church.

Knowledge is a necessary element of faith as an epistemological phenomenon and a psychological state that goes beyond evaluating statements for truth into the sphere of people's personal relationships to God and each other.

Knowledgeable faith is based not on an unsubstantiated and groundless acceptance of the truth of anyone's statements, but on trust in God and another person, which is confirmed by the life experience of the trustee.

Philosophers and scientists who believe in God are no different in their faith from less educated representatives of their faiths. Religious faith is not only knowledge of the existence of God, but also absolute trust in Him as creator and Savior.

However, it would be a mistake to assume that a philosopher and a scientist "believe" in the truth of their hypotheses and assumptions in the same sense that they believe in God. When putting forward scientific hypotheses based on certain premises and assumptions, philosophers and scientists are guided not by faith in the truth of their ideas, but by knowledge of theoretically grounded and empirically confirmed results of philosophical and scientific knowledge.

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辩证类型学概念：人与社会的互动：社会和本体论基础
THE CONCEPT OF DIALECTICAL-TYPOLOGICAL INTERACTION BETWEEN MAN AND SOCIETY: SOCIAL AND ONTOLOGICAL FOUNDATIONS

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注释。本研究旨在明确社会本体论范式——辩证类型学范式中人与社会辩证类型互动概念的关键点。本研究的创新之处在于，在现代社会转型的语境中，阐明了人与社会辩证类型互动概念的本质和主要内容。该概念的主题在自然、人、社会和文化类型学辩证统一原则的体现背景下得到论证。作者运用逻辑认知的话语体系，从人与社会的辩证多样性和类型学相似性两个角度刻画了人与社会的属性。揭示了在社会性概念范式中人与社会辩证类型互动的本体论基础。运用了反思性、客观性、因果性等原则，以及由抽象到具体、互补性、同一性、比较性等方法。

关键词：人、社会、辩证法、类型学、本体论、概念、辩证类型学、社会性、互动性。

Annotation. *Purpose of the study-to identify the key points of the concept of dialectical-typological interaction of man and society in the paradigm of social ontology, dialectical typology. The novelty of the work consists in substantiating the essence and main content of the concept of dialectical-typological interaction of man and society in the discourse of modern social transformations. The subject matter of the proposed concept is substantiated in the context of the manifestation of the principle of dialectical unity of typologies of nature, man, society and culture. In terms of logical-cognitive discourse, the author characterizes properties of man and society in the discourse of their dialectical diversity and typological similarity. The ontological foundations of the dialectical-typological interaction of man and society in the conceptual paradigm of sociality are revealed. The principles of reflection, objectivity, causality, as well as methods of ascent from the abstract to the concrete, complementarity, identity, comparison are used.*

Keywords*: man, society, dialectics, typology, ontology, concept, dialectical-typological, sociality, interaction.*

"Man has two worlds: one that created us, another, which we have been creating from time immemorial to the best of our ability"
N.A. Zabolotsky

In the context of social methodology, the relevance of the research topic is determined by: a) certain difficulties in developing the scientific-materialist foundations of the fundamental concept of dialectical-typological interaction between the individual and society; b) the imperfection of the logical-epistemological approach in scientific cognition for defining the relationship between the categories of "dialectics" and "typology" as the logical-epistemological basis of the concept in question; c) the lack of a research approach within the discourse aimed at resolving the ontological and epistemological contradictions concerning the semantic definition of the essence of the multi-component concept "dialectical-typological" in scientific cognition.

Human and society are important categories of social philosophy. Various forms of manifestation of interaction between them are a natural result of qualitative objectification of that natural-social-cultural environment, the content of which is reflected by the concepts: "sociality", "being", "essence", "existence", "sublation", "form", "content", "ontology", "interaction", "modification", "property", "process", "potentiality", "causality", "many-similarities", "state", "similarity", "difference", "identity", "conceptuality", "reality", "space", "time" and others.

The factual relationship between these concepts is quite obvious. If this is so, then we can state methodologically important significance of the following conceptual objectivity: the relationship between the concepts (categories) of the ontological and epistemological (subjective) reality of socionaturally objective, dialectically concrete, typologically defined (typo-defined). As a consequence, everything in the world of visible and invisible being is dialectically and typologically interconnected, and the ontological moments of iterations between objects of reality are of a correlative nature, which expresses the immanent foundations of their lawful interaction, including multifaceted relationships in the social environment. This thesis is reduced from the ontology of G.V.F. Hegel, who in the most general terms distinguished nature (the being of nature) and the activity of people (social being), which are in contradictory interaction between themselves. It is the ontological and logical-gnoseological nature of these relationships, in predications of the essence and existence of man and society, determines the typology of the socio-natural conditions of an individual's life [1], his social goals, essential meanings, spiritual and moral interests and anthropo-cultural needs of being [8].

It is quite obvious that the concept of dialectical-typological interaction between man and society has its own subject matter, its own methodological foun-

dations and approaches to the actualization of diverse connections, multi-property relations in society. The concept is defined unified correlation between the concepts of "dialectics" and "typology", which emphasizes the characteristic nature of the concept of "interaction" itself.

Based on the specific content of these categories, we can say with certainty that they serve, firstly, as a cognitive means of understanding objective and subjective reality, and their logical-cognitive potential and epistemological fundamentality of practical application are oriented towards a comprehensive understanding of reality. Secondly, the ontological objectivity of the categories of dialectics and typology is connected with the concept of "property". Aristotle spoke about this methodologically important connection, authoritatively asserting in his "Metaphysics": "property… does not exist apart from essences…" [2, p. 324]. Thirdly, the conceptual relationship of the sought-after concepts, according to the author, «represents the universal constructiveness of their semantic certainty of the deepest logical-methodological order. The scientific-theoretical component of this thorough constructiveness contributes to the transformational identification their "combinable unity" in the essentiality of socio-natural objectivity, anthropo-cultural concreteness, and intellectual significance" [5, p. 213].

It is generally recognized that dialectics and typology have great cognitive potential. According to the author, "Dialectics is a theory of the development of reality. As a truly scientific method of cognition, dialectics is an unsurpassed logical and methodological means of understanding reality in all essential forms of its typological manifestation"[4, p. 50]. Fundamentality of categories dialectics and typology has a very specific meaning, inextricably linked with the dialectical-materialistic understanding of the processes of development of nature, society, and the thinking of a practice-oriented person. It is precisely the substantial content of modern man's thinking that allows him to "figuratively go beyond the limits of present existence, to creatively operate with the subjective content of mental accidents aimed at understanding the nature of the world and the natural world, based on certain ideological convictions" [3, p. 38].

It is characteristic that in its objective substantiality, dialectics constitutes the true nature of being, while typology is an essential formation that reveals the multi-faceted similarity of the concretely existing in a diverse manner. This establishment confirms the fundamentality of the manifestation of the principle of the dialectical unity of the typologies of nature, man, society, and culture in the realities of the comprehensive and multifaceted development of reality. In this regard, it becomes clear why, within the subject field of scientific-theoretical cognition, dialectical typology integrates into a unified whole dialectics as a method of reality's development and typology as a method of existence of the properties of this reality, co-evolutionarily revealed in the concept of the "diatype" as a kind of absolutely given genus of being [6, p. 243-248].

The ontological significance of the concept of dialectical-typological interaction of man and society is reduced by the comprehensive manifestation of the category of "interaction", the semantic role and practical significance of which in the dialectical-typological connections (relations) of society is of primary importance. This is possible due to the fact that interaction, firstly, is the leading and guiding force of the development of the social environment. Secondly, interaction is a connection between different stages (steps) of development, the purpose of which is to preserve certain elements of the whole or its individual characteristics during the transition to a new qualitative state. Thirdly, interaction is an obligatory element of the contradictory development of social existence and social consciousness, due to which their content is enriched with new quality, while, in a removed form, retaining the positive aspects of the old. Moreover, the unity of opposites (removal of negation - the author) is of an auxiliary nature. The philosophy of the removal of the self-denying essence, with the dialectical-typological mutual transition of opposites into each other, leads to a naturally emerging new similarity in the social environment, as to a certain integral new formation, dialectically given in the concrete unity of its subsequent typological set. It is quite obvious that in such semantic objectivity the concept of dialectical-typological interaction, to a certain extent, on the one hand, is associated with the content of various social ontologies of domestic and foreign authors, the cognitive synthesis of which is possible on the "basis of the paradigm of complexity as a further irreducible integrity" [7, p. 14].

On the other hand, the concept to a certain extent conceptualized by the ontology of all-unity of the Russian religious philosopher V. S. Solovyov. All-unity, as a concept of ontological knowledge, denotes the principle of the internal form of the perfect unity of the multitude, according to which all elements of such a set are identical to each other and identical to the whole, but at the same time do not merge into an indistinguishable and continuous unity, but form a special polyphonic structure "transrational unity of separateness and interpenetration" (according to S.S. Khoruzhy).

In fact, dialectical-typological interaction is a conceptual constant unity of diversity, reflecting the predetermination of the development of man, society and civilization, the ontological order of the changes occurring in their social connections, relationships, mediations. In the concept under consideration, one can distinguish the ontological component dialectical-typological interaction of man and society, which objectifies the natural order of coordination of its most important parts: "impact – mutual transition – modification" based on immanent set of dialectical universals triads "essence – essential – existence" and typological universals of the logical-compositional trivium "similarity – identity – difference". It makes sense to acknowledge that the identified the ontological component, in the main and fundamental sense, is aimed at dialectical modification of the typolog-

ical properties of man and society, based on the author's postulate of dialectical typology (axiom of diatype): "essence is similar, existence is different, the essential is multi-similar in diversity, and their identity is absolute in the Existing". This postulate activates an innumerable number of combinations of manifestation of the properties of man and society in the culture-intensive ontology of their active life activity.

Social and ontological foundations of the concept of dialectical and typological interaction of man and society - these are the fundamental principles of the development of the universe, specified by science, which in the most general categories of existence, reflect the essence, content, and structure of social being. In this regard, the concept is aimed at identifying the fundamental sources of human existence, axiological mechanisms for the formation and development of the spiritual and moral existence of a socialized individual in the system of social relations, including, first of all, comprehensive upbringing and education, the continuity of socio-cultural norms and national-religious traditions.

In its most general form, the socio-ontological foundations of the concept provide, primarily, for the presence of the following key provisions, the detailed nature of which determines their content. Based on the fact that the social is the fundamental basis of human existence, some of its manifestations are to be considered:

a) ecofactor of nature's existence. The existence of natural nature is a fundamental ontological basis on which all interactions between man and society are built. This means that the reality of nature itself, its laws, processes and the ecoforms of life existing in it are the starting point that determines the possibilities and limitations of man's presence on planet Earth. True understanding and respect for natural nature, as well as the development of sustainable ecological methods, techniques and forms of interaction with it are the key to the well-being and long-term development of society and human civilization as a whole;

b) objectivity and subjectivity of social relations. Society exists objectively as a system of social relations, norms and institutions that influence a person. However, it is also formed through the subjective activity of people, their consciousness, values and specific actions. The functionality of these connections and relations is determined by the ontology of their spatio-temporal factuality, cultural and historical eventfulness. At the same time, it should always be remembered that social reality is in a state of constant modification and dialectical development, which is due to both internal contradictions and external influences;

c) the influence of essential models (concepts) of anthropo-social modifications of the typology (type) of man and the type (typology) of society. The dialectical interrelation and ontology of interdependence of the properties of an individual and society should be considered in the cognitive paradigm of a typologically uni-

fied social reality, which is characteristic of a specific society. The type of society forms the typology of a person, and a person, by his actions, transforms society in a dialectical-typological way. It is necessary to remember the contradictory dynamics of the forms of such existence (coexistence). These contradictions are between: personal and public, needs and possibilities, individual and collective, traditions and innovations, interests and beliefs, consciousness and will, and others.

d) multifactorial anthropo-cultural historicity. The dialectical approach emphasizes the historicity of social reality, understanding that the forms, methods and techniques of socio-typological interaction between man and society change depending on historical conditions and a specific socio-cultural context. The ontology of cause-and-effect relationships defines man as a bearer of certain social roles, statuses, competencies and norms that determine his position in society, the level of culturally significant communication when interacting with other people in a particular historical period of time.

Based on the dialectical logic of philosophical knowledge, the methodology of Lenin's theory of reflection, and the conceptual ideas of dialectical typology, we can highlight some essential points of the author's concept of dialectical-typological interactions between man and society. In the most general form, they are the following interrelated statements:

- the universal interaction of objects of reality has a multifaceted character, the objective direction of which is determined by various influences of both the external and internal environment;
- the properties of man and society contain typological certainty, as a result of which the dialectical mutual transition of their content into each other is objective, natural, irreversible, and multi-similar;
- the type-determination of the properties (qualities) of man and society is multi-similar in the dialectical diversity of the communicative set of contacts between them, including those of a contradictory nature;
- The dialectical interaction of man and society, as well as their typological properties (qualities) is determined by constant modifications of essential states, which are conditioned by the unity of similarities and differences of their characteristic features of contradictory objectivity, comparative givenness, and comparative concreteness.

Thus, in the subject field of socio-philosophical discourse associated with the methodology of comprehensive knowledge of the laws of development of social existence and social consciousness, the conceptual nature of the dialectical-typological interaction of man and society is revealed.

Conceptual the nature of the dialectical-typological interaction of man and society is determined by the manifestation of dialectical laws, ontological regularities, anthropo-cultural principles, typological objectifications. Such a unique

character of the concept reflects the meaning-creating forms of unity between the individual and society, specifies the procedural nature of the interaction of their multifaceted properties in the paradigm of dialectical diversity and typological similarity.

The presented concept, with its high degree of subject objectivity, helps to explain various connections and relationships between man and society, understanding the multi-property factors (conditions) that influence the modification of their interactions in the discourse of ontology and epistemology of similarity, which opens up new scientific-theoretical and fundamental-applied horizons of knowledge of the integrity of social existence, comprehensively develops his world-creating potential.

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面向未来化学教师的持续实践方法培训组织模式及其进一步支持
A MODEL FOR ORGANIZING CONTINUOUS PRACTICE-ORIENTED METHODOLOGICAL TRAINING FOR FUTURE CHEMISTRY TEACHERS AND THEIR FURTHER SUPPORT

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摘要：本文论证并发展了一种面向未来化学教师的持续实践导向方法论培训及其后续支持的组织模式。该培训以作者的课程“化学问题编制与解决方法论”为基础。

关键词：化学教育，面向实践的化学教师持续实践导向方法论培训，方法论能力，师范大学，普通教育机构。

Abstract. *The article substantiates and develops a model for organizing continuous practice-oriented methodological training of future chemistry teachers and their subsequent support. The basis for such training is the author's course "Methodology for compiling and solving problems in chemistry".*

Keywords: *chemical education, continuous practice-oriented methodological training of a chemistry teacher, methodological competence, pedagogical university, general education organization.*

Introduction. This article was written within the framework of the implementation of the research work "Natural-scientific direction of integration of the pedagogical university and the general education system within the framework of the course "Methodology for compiling and solving problems in chemistry" (registration number of the topic in the EGISU NIOKTR system VGEA-2025-0052).

The relevance of the conducted research is due to the need to improve the quality of chemical education of citizens with the possibility of practical application of the acquired knowledge, skills and abilities in the work of chemical industries, the implementation of modern chemical technologies, which is of decisive importance for ensuring the technological sovereignty and national security of the Russian

Federation. Since the 90s of the twentieth century, the practice-oriented, polytechnic focus of the content of chemical education has significantly decreased, which in general had a negative impact on the quality of general chemical education of Russian citizens, on the choice of professions by school graduates that are not associated with the use of theoretical and practical aspects of chemistry, gradually leading to a personnel shortage at chemical industry enterprises, a decrease in the share of modern domestic chemical technologies used in production. The slowdown in fundamental research in chemistry and innovative development of the chemical industry has led to the loss of Russia's leading positions in the world market of chemical products. Today it is obvious that improving the quality of chemical education, the return of domestic achievements in the field of chemical science and production directly depend on the methodological training of a chemistry teacher, his ability to provide, first of all, in the general education system, practice-oriented teaching of chemistry. At the same time, the methodological competence of a chemistry teacher is influenced by both the achievements of chemical science, engineering and technology, causing the need for continuous improvement of the content of chemical education of schoolchildren, and pedagogical science and educational practice, determining the choice and use of pedagogical tools for teaching chemistry [3].

Consequently, maintaining a high level of chemical education of citizens is directly related to the organization of continuous practice-oriented methodological training of a chemistry teacher and his further support. The organization of this process is possible only through the joint activities of a pedagogical university and general education organizations with the choice of those didactic units of methodological training that will become the basis for the continuous methodological development of a chemistry teacher, ensure the practice-oriented nature of the content of chemical education and the methodological competence of the teacher.

The purpose of the article is to substantiate and develop a model for organizing continuous practice-oriented methodological training of future chemistry teachers and their further support.

Materials and methods. Using the methods of analysis, synthesis and generalization, we analyzed the approaches of researchers to the development of models of continuous methodological training of teachers (E. Ya. Arshansky, A. A. Belokhvostov, E. V. Bogomolova, V. P. Kosyrev, A. V. Malev, I. E. Malova, N. I. Pak, M. G. Fidarova, M. A. Shatalov et al.), the creation of models and systems of interaction between a pedagogical university and general education organizations (I. V. Barmatina, V. L. Vinogradov, Yu. A. Zhadaev, O. V. Kitikary, V. V. Sdobnyakov, N. O. Yakovleva et al.), the organization of practice-oriented methodological training of chemistry teachers (M. A. Arzhakova, S. I. Gilmanshina, G. F. Melnikova, O. V. Ogorodnik, M. S. Pak, T. I. Suldina, L. A. Chernysheva et al.),

which made it possible to identify the common and distinctive features of the indicated models, the lack of research on the development of models of methodological training and further support of a chemistry teacher directly in the interaction of a pedagogical university and the general education system, as well as problems and trends in the organization of its continuous practice-oriented methodological development.

Based on the methodology of system, integrated and competence approaches, and using the modeling method, we have substantiated and developed a model for organizing continuous practice-oriented methodological training of future chemistry teachers and their further support, which we provide below.

Main part. Our model is an interaction of interdependent blocks: conceptual-target, organizational-subjective, content-technological, and evaluative-resultative.

The presence of a conceptual-target block is due, first of all, to the influence of various external and internal factors, which determine the organization of continuous practice-oriented methodological training of future chemistry teachers and their further support in the interaction of the pedagogical university and the general education system. For the university, such external challenges are the state's requests not only for the training of chemistry teachers, which is reflected in educational and professional standards, the Concept of Training Pedagogical Personnel, national projects in terms of education development, but also the directions of the country's strategic development set out in the Decrees of the President of the Russian Federation "On the National Development Goals of the Russian Federation for the Period up to 2030 and for the Perspective Up to 2036" and "On the National Security Strategy of the Russian Federation", the Concept of Technological Development for the Period up to 2030, the Strategy for the Development of the Chemical and Petrochemical Complex for the Period up to 2030 and directly determining the role of chemical science, education and production in the development, independence and security of the country. Internal challenges for pedagogical universities are the requests of future chemistry teachers themselves, who already during their educational practices realize the need for a practice-oriented focus of methodological training. For comprehensive schools, external challenges are also associated with the state's requirements for the quality of chemistry education of schoolchildren, which are characterized in the standards of basic and secondary general education and national educational projects. At the same time, internal challenges arise in the form of content-subject and methodological deficiencies of chemistry teachers, the need to develop their methodological competence in providing practice-oriented teaching of chemistry to schoolchildren with the simultaneous education of the student's personality through modern chemical knowledge.

We consider the point of contact between external and internal influences of the pedagogical university and the general education system in the context of methodological training and further support of a chemistry teacher to be the Order of the Government of the Russian Federation of 19.11.2024 N 3333-r "On approval of a comprehensive plan of measures to improve the quality of mathematical and natural science education for the period up to 2030", which defines measures to improve the quality of natural science, and therefore chemical education. Continuous practice-oriented methodological training of a future chemistry teacher and his further support through the natural science direction of integration of the university and school is an important component of the plan to improve the quality of chemical education in the country. Such training of future teachers implies: development of motivation in chemistry teachers to master and continuously improve methodological competence in a practice-oriented manner; consistent and successive accumulation of knowledge, skills and abilities in compiling and solving practice-oriented problems in chemistry with their subsequent application in the educational process; formation and development of professional qualities of the individual that are significant for continuous practice-oriented methodological growth of the chemistry teacher and preparation of students for the practical use of chemical knowledge and technologies.

The above defines the goal of the model - continuous formation and development of the methodological competence of the teacher in practice-oriented teaching of chemistry to schoolchildren.

This goal defines the tasks of the model: 1) ensuring continuity between the educational needs/challenges and methodological competence of future chemistry teachers; 2) ensuring continuous scientific and methodological support of the chemistry teacher, creating conditions for continuous professional development and readiness for innovative methodological activities; 3) ensuring monitoring of the quality of implementation of the natural science direction of integration of the pedagogical university and the general education system.

Of course, the efficiency and effectiveness of the organization of continuous practice-oriented methodological training of future chemistry teachers and their further support depend on the competent choice of scientific foundations for this process. Based on the analysis of the works by S. O. Altukhova, E. Ya. Arshansky, S. V. Belov, A. A. Belokhvostov, E. V. Bogomolova, V. L. Vinogradov, V. P. Kosyrev, M. L. Lurye, A. V. Malev, V. N. Sadovnikov and other researchers, it was possible to identify the system-integrative, practice-oriented, concrete-historical, acmeological approaches as methodological bases, as well as a set of principles (systematicity, continuity, consistency, integrativity, practical orientation, polytechnicism, historicism, professional and personal success, gradual achievement of the peaks in one's own development). The organizational and subjective block

of the developed model characterizes the interaction of the pedagogical university and the general education system in organizing continuous practice-oriented methodological training of future chemistry teachers and their further support. This interaction should, first of all, create a regulatory framework for the joint work of educational organizations related to different levels of education and having different departmental subordination. We believe that in modern conditions the best organizational form of interaction between a university and a school is an educational and pedagogical district formed on the basis of a pedagogical university and including in its orbit, first of all, general education organizations. A single agreement between the participants of the educational and pedagogical district removes many organizational and legal issues, creating conditions for productive interaction of all its participants. Therefore, the main subjects of the continuous methodological growth of a chemistry teacher are a pedagogical university and general education organizations. The interaction itself is carried out at the level of the administration of the university and schools, teachers of the school and the university department of chemistry and / or methods of teaching chemistry, students - future teachers and schoolchildren. It should be noted that the direct integration of the pedagogical university and general education organizations allows us to quickly identify and eliminate shortcomings in the methodological training of future chemistry teachers, as well as deficiencies in the methodological work of practicing teachers; determine the effectiveness of new methods of teaching chemistry and promptly introduce them into educational practice; respond quickly to scientific and technical achievements and reflect them in educational programs, as well as interact with scientific organizations and manufacturing enterprises, increasing the level of practical application of chemical knowledge.

The content and technological block characterizes a set of measures (areas of interaction) for the implementation of the natural science direction of the integration of the pedagogical university and the general education system, aimed at ensuring the seamlessness of practice-oriented methodological training of future chemistry teachers and their further support.

Based on the works [1; 2; 4], joint methodological and research activities in the format of “pedagogical university teacher - student - teacher” is one of the conditions for the implementation of continuity between the educational needs / challenges and methodological competence of future chemistry teachers. Formation and further development of methodological competence of future chemistry teachers in practice-oriented teaching of schoolchildren is a consistent and continuous accumulation of knowledge, skills and abilities in terms of compiling and solving practice-oriented problems in chemistry with their subsequent application in the educational process and implies the implementation of a complex multi-stage process.

The implementation of the first task involves the formation of practice-oriented methodological competencies in the future chemistry teacher in accordance with the educational challenges of our time and is carried out in 5 stages:

Stage 1. Definition of the goals and content of methodological training of the future teacher in the implementation of practice-oriented teaching of chemistry by means of chemical problems.

Stage 2. Organization of practice-oriented educational activities of students aimed at developing methodological competencies in future chemistry teachers in implementing practice-oriented teaching of chemistry by means of chemical problems during the course of mastering the discipline "Methodology of Teaching Chemistry" (section "Methodology for Solving the Main Types of Problems in Chemistry").

Stage 3. Development of methodological competencies in future chemistry teachers in implementing practice-oriented teaching of chemistry by means of chemical problems during the course of the practice "Pedagogical Practice in Chemistry (Educational)".

Stage 4. Development and improvement of methodological competencies in future chemistry teachers in implementing practice-oriented teaching of chemistry by means of chemical problems during the course of mastering the discipline "Methodology for Compiling and Solving Problems in Chemistry".

Stage 5. Development and improvement of methodological competencies in future chemistry teachers in implementing practice-oriented teaching of chemistry by means of chemical problems during the course of the practice "Pedagogical Practice in Chemistry (Industrial)".

The implementation of the second task involves the integration of joint research activities in the format of "teacher of the pedagogical university - student - teacher" and is carried out in three stages:

Stage 1. Development of students' research potential in the field of practice-oriented teaching of schoolchildren by means of the academic disciplines "Methodology of Teaching Chemistry", "Methodology of Compiling and Solving Problems in Chemistry". At the same time, in order to teach students the methodological foundations of pedagogical research in the field of methods of teaching chemistry, it is necessary to create conditions for the integration, coordination of research work of practicing teachers and students when writing a term paper. And also to provide conditions for combining the research work of practicing teachers, university teachers and students.

Stage 2. Development of student interns' abilities to integrate modern scientific knowledge on the organization of practice-oriented teaching by means of chemical problems in educational practice. The development of research competence in student interns and practicing chemistry teachers occurs due to the organization of

joint research work during pedagogical practice. Which ensures the interconnection of the theoretical and practical components of the methodological training of future chemistry teachers by means of a pedagogical experiment.

Stage 3. Scientific and methodological support for a chemistry teacher in organizing practice-oriented teaching by means of chemical problems. Which involves: providing the teacher with methodological publications on organizing pedagogical research at school, creating a unified information and methodological base; organizing scientific and practical conferences/seminars in the format of "pedagogical university teacher-student-teacher"; completing advanced training courses for teachers on organizing practice-oriented teaching by means of chemical problems; organizing mentoring to provide the practicing teacher with scientific and methodological support and advisory assistance in organizing practice-oriented teaching by means of chemical problems and implementing a pedagogical experiment.

The implementation of the third task involves a systemic and systematic diagnosis of the level of formation of the methodological practice-oriented competence of future chemistry teachers through monitoring the difficulties and problems of students and teachers in the educational process. This requires the development of appropriate technological foundations for organizing systematic diagnostics of the levels of formation of practice-oriented methodological competence of future and practicing chemistry teachers with parallel identification of methodological difficulties and problems.

The evaluation and results block characterizes a set of measures for assessing the effectiveness of the implementation of the developed model of integration of the pedagogical university and the general education system, the purpose of which is to ensure continuity between the formation and further professional support of a chemistry teacher's sustainable methodological competence in implementing practice-oriented teaching by means of chemical problems.

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提高田径技巧运动员跳跃动作的速度力量能力

IMPROVING THE SPEED-STRENGTH ABILITIES OF ATHLETES IN JUMPS ON THE ACROBATIC TRACK

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注释：本文提出了一种提高高水平的技巧跑道跳跃运动员速度力量素质的方法。该方法采用中等重量的跑步和跳跃练习。该方法实施了两个月，结果表明，实验组15–16岁运动员的速度力量素质发展效果显著优于从事该项运动训练的同等水平的技巧运动员。

关键词：技巧、运动训练、速度力量素质、方法论。

Annotation. *The paper presents a method for improving the speed-strength qualities of highly qualified athletes in jumping on an acrobatic track. The developed method uses running and jumping exercises with moderate weights. The developed method was implemented over two months and provided significantly higher results in the development of speed-strength qualities in 15–16-year-old athletes of the experimental group compared to acrobats of the same qualification who are engaged in the standard of sports training for this sport.*

Keywords: *acrobatics, sports training, speed-strength qualities, methodology.*

Introduction. The modern stage of acrobatics development is characterized by continuous complication of competition programs and growth of requirements for physical and technical preparedness of athletes, especially at the stage of higher sports mastery. Preparation of reserves of the national team of the Russian Federation requires athletes to combine a high level of special physical preparation, perfect technique and stability of results when performing acrobatic jumps of varying complexity. Development of sports training standards is accompanied

by the introduction of universal methods of developing speed-strength qualities, which largely determine the success of the performance of competition programs by highly qualified athletes. However, this does not take into account the specifics of performing multiple explosive efforts in acrobats15-16years, reaching the level of Master of Sports. This requires not only the development of speed-strength qualities [1,2], but also the improvement of special physical training, taking into account the age characteristics of young athletes.

This article is devoted to the search for new means and methods of improving the speed and strength of 15–16-year-old athletes.

Purpose of the study consisted in the development and evaluation of the effectiveness of a methodology for improving the speed-strength qualities of athletes in jumps on the acrobatic track.

Methods and organization of the research. This study was conducted at the state budgetary institution of additional education, the Moscow Complex Sports School of Olympic Reserve "Yug". The study involved 10 acrobats aged 15-16 years, who were at the stage of sports improvement and had the sports title "Master of Sports". The athletes were divided into two groups of five people, the control group (CG) and the experimental group (EG).

To assess the level of speed-strength preparedness of the athletes participating in the acrobat experiment, complex testing was conducted. The testing included the following:

1. Acrobatic combination;
2. Long jump from the spot
3. Jumping onto a 50 cm high platform in 60 seconds.
4. Hanging leg raises on a gymnastic wall.

All exercises were performed after a standard warm-up, under identical conditions, which excluded the influence of external factors and allowed the results to be considered reliable. These tests are included in the list of official control standards reflecting key physical qualities that form the basis for the effective performance of acrobatic series on the acrobatic track.

For an objective assessment of the effectiveness of the developed method for improving the speed-strength abilities of athletes, the student t-test was used when comparing the average values of two independent samples for each test.

A method for the systematic development of explosive strength, endurance and coordination of movements necessary for the effective execution of complex acrobatic combinations was developed for the experimental group. The method included three specially selected exercises with weights performed in the final part of the training, immediately after the blocks of general physical and special physical training. This approach allowed the athletes to be involved in a state of preliminary fatigue, thereby enhancing the effect of specific adaptation.

The methodology includes the following exercises:

1. Running with a load of 10-15% of body weight - 15 meters. The exercise is performed in series of 5-8 accelerations with rest pauses of 1-1.5 minutes. The recovery time is selected to ensure partial recovery, allowing you to maintain the explosive nature of the work without sudden fatigue and avoid injuries. Running with a load within the framework of the method performs the key function of forming the starting acceleration and explosive force, which underlie the dynamics and amplitude of acrobatic actions.

2. Jumping with a change of legs onto an elevation with a weight of 5-10% of body weight. It is performed using a vest or dumbbells weighing 5-10% of body weight. This exercise is aimed at developing explosive strength and stability during vertical movement. It is performed in the form of 8-10 repetitions in 3-4 approaches with a rest pause of 1-1.5 minutes. It is important to note that this exercise is used in a limited volume and with mandatory control of technique.

3. Jumping from a lunge with a change of legs (with subsequent weighting of 1 kg). The first two weeks the exercise is performed without additional weighting, which allows the athlete to concentrate on the correct technique, maintaining balance and coordination of movements. Starting from the 3rd week, the exercise is performed with weights weighing 1 kg, fixed on the shins, which increases the load and complicates the movement, increasing the training effect. Jumping is performed 10-12 repetitions per approach, 3-4 approaches with a rest interval of 1 minute between them.

Research results and discussion. Primary testing was conducted during the first training week of the study for two days, which provided optimal conditions for the recovery of athletes and obtaining the most reliable results. Table 1 presents the results obtained, which show that the composition of the control and experimental groups during the complex testing showed no reliable differences in the development of speed-strength qualities of both groups of acrobats.

Table 1

Results of testing the control and experimental groups before the start of the experiment

Test	KG (n = 5)	EG (n = 5)	Student's t-test	Reliability of difference, p
Acrobatic combination performance, FIG score	42.58 ± 1.31	42.90±1.27	0.46	>0.05
Long jump from the spot, cm	202.0 ± 4.7	202.4 ± 4.5	0.14	>0.05
Jumping on a cube 50 cm high in 60 seconds, once	57 ± 3.2	59 ± 3.0	1.02	>0.05
Leg raises on the gymnastic wall, times	12.6 ± 1.1	12.9 ± 1.1	0.43	>0.05

The average values of the acrobatic combination performance are statistically insignificant ($p>0.05$). The obtained assessments of the acrobatic combination indicate an equal level of technical preparedness of the participants in the control and experimental groups at the beginning of the experiment.

No statistically significant differences were recorded in the results of the long jump ($p>0.05$), which confirms the equivalence of the physical fitness of the participants in both groups at the beginning of the study.

The indicators of jumping on a cube and assessment of leg lifts on a gymnastic wall showed no significant differences in both groups ($p>0.05$), which corresponds to the standards of special physical training for athletes of this age.

Therefore, it can be concluded that the control and experimental groups are statistically homogeneous in terms of the level of development of basic speed-strength qualities and specific acrobatic indicators ($p > 0.05$).

The study was conducted over two months. The experimental group trained using a method that takes into account the age characteristics of young athletes when selecting exercises, limiting the weight (no more than 15% of body weight), choosing the frequency of repetitions and providing recovery intervals, which made it possible to adapt the load to the physiological capabilities of young athletes.

The retest data are presented in Table 2 for the control group and the experimental group at the completion of the study.

The results of repeated testing in the test “Performance of an acrobatic combination” of athletes of the control and experimental groups showed that the differences between the results at the beginning and at the end of the study between the groups were statistically insignificant ($p> 0.05$), which allows us to conclude that the level of competitive technique increased approximately equally in both groups.

The assessment of the reliability of differences in three other control exercises indicates that the indicators of long jump from a place, jumping onto a 50 cm cube and the number of leg lifts on a gymnastic wall have changed reliably ($p<0.05$). This confirms the fact that the proposed method promotes the development of speed-strength qualities in acrobats of the experimental group.

Table 2

Dynamics of indicators of the control and experimental groups at the end of the study

Test	Upon completion of the study		Student's t-test	Reliability of difference, p
	KG	EG		
Acrobatic combination performance, FIG score	43.32 ± 1.28	44.82 ± 1.13	1.95	>0.05
Long jump from the spot, cm	203.2 ± 4.9	214.2 ± 5.1	3.46	<0.05
Jumping on a cube 50 cm high in 60 seconds, once	59 ± 2.9	65 ± 3.1	3.15	<0.05
Leg raises on the gymnastic wall, times	15.6 ± 1.2	18.4 ± 1.3	3.54	<0.05

It should be noted that such results of sustainable development of speed-strength qualities were achieved by using running and jumping exercises with weights in the methodology. The indicators in the tests of long jump and jumping on a 50 cm cube confirm the significant contribution of the exercises used in the methodology to maintain the height and rhythm of acrobatic combinations on the acrobatic track.

The proposed control exercises turned out to be sensitive to the dynamics of changes in speed-strength qualities in athletes of the experimental and control groups. This serves as a prerequisite for a statistically significant increase in the indicators determining the speed-strength potential of acrobats. Such growth is achieved through a complex effect on the technical-coordination and speed-strength components of the preparedness of athletes of the experimental group due to:

1. Increase speed gives additional height and amplitude when performing acrobatic elements.

2. Practicing rhythm with the help of short accelerations with weights and jumping exercises, it allows the acrobat to optimize his movements when interacting with the support and to ensure a confident push-off in an acrobatic combination.

The obtained results confirm the opinion of A.V. Golubev about the necessity of using exercises [1] in training acrobats that help to increase the power of repulsion due to the improvement of coordination of the main muscles of the body and legs. In the presented method, the development of repulsion power was facilitated by the exercises "jumping with a change of legs onto an elevation with weights" and "jumping from a lunge with a change of legs". The latter exercise was first mastered without weights, and only after mastering the correct technique was it performed with a small weight.

In conclusion, we note that the question arises as to why it was not possible to improve the performance of the acrobatic combination, the results of which were comparable with the indicators of the control group. Probably, the time of the study did not allow adapting the performance of the technique of acrobatic elements of the competitive composition to the new level of development of speed-strength qualities, i.e., the athletes of the experimental group did not manage to fully develop the ability to include speed-strength mechanisms throughout the entire acrobatic combination without losing amplitude and technique.

Conclusion. A method for improving the speed-strength qualities of athletes in jumps on the acrobatic track has been developed, its effectiveness has been proven in comparison with the generally accepted method of speed-strength training of highly qualified acrobats at the stage of higher sports mastery. The proposed method allows for the successful development of speed-strength qualities, but improving the technique of performing a competitive composition requires a longer period of time than the study lasted.

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成人地理教学再培训中的实践导向方法：挑战与解决方案
PRACTICE-ORIENTED APPROACH IN THE RETRAINING OF ADULTS FOR TEACHING GEOGRAPHY: CHALLENGES AND SOLUTIONS

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摘要：本文分析了实践导向方法在成人地理教学再培训项目中的实施情况。证实了基于活动的学习模式的有效性，尤其是在培训时间有限、成人学习者教育背景多样化的情况下。主要困难包括制图素养低、语义阅读能力不足以及课程规划方面的挑战。本文讨论了以实践为导向的解决方案，例如微课、课程地图设计、案例教学、实地实习和数字地图项目。特别关注了数字资源（谷歌地球、Figma、Tilda、莫斯科电子学校）在确保专业能力形成方面的作用。本文提出了一个诊断模型，包括反思报告、能力清单、项目任务和演示考试。结论是，实践导向方法为成人学习者提供了在短时间内掌握地理教学基本技能的机会，并有助于提高教师培训的整体质量。

关键词：再培训、实践、地理教师、能力、案例、数字资源、实践导向方法。

Abstract. *The article analyzes the implementation of a practice-oriented approach in adult retraining programs for teaching geography. The relevance of activity-based learning formats is substantiated, especially in conditions of limited training time and diverse educational backgrounds of adult learners. The main difficulties include low cartographic literacy, insufficient skills in semantic reading, and challenges in lesson planning. Practice-oriented solutions such as micro-lessons, lesson map design, case-based tasks, field practicums, and digital map projects are discussed. Particular attention is given to the role of digital resources (Google Earth, Figma, Tilda, Moscow Electronic School), which ensure the formation of professional competencies. A diagnostic model is proposed, including reflective reports, competence checklists, project tasks, and a demonstration exam. It is concluded that the practice-oriented approach provides adult learners with the opportunity to acquire the fundamental skills of geography teaching within a short period and contributes to improving the quality of teacher training in general.*

Keywords: *retraining, practice, geography teacher, competencies, case, digital resources, practice-oriented approach.*

Introduction

The shortage of geography teachers in schools has become a systemic issue in many countries, including Russia. In response to this, professional retraining programs for adults from other fields have been developed to meet the urgent need for qualified teaching staff (Slastenin, 2019; Knowles, 2020). Unlike traditional teacher education, such programs are limited in time and must focus on the most essential competencies. Adult learners often come from backgrounds in economics, law, or natural sciences and lack pedagogical preparation. This requires innovative approaches to training, where practice plays a central role.

The practice-oriented approach has been widely discussed in pedagogy since the works of John Dewey and later in Russian didactics by V.V. Davydov. It emphasizes 'learning by doing' and situating theory within authentic tasks. In the context of retraining, this approach is particularly relevant because it allows learners to build professional identity through immediate engagement in teaching practices.

1. Theoretical and methodological foundations

The practice-oriented approach builds upon several pedagogical traditions:

- Activity-based learning: knowledge is acquired through meaningful activity (Davydov, 2000).

- Competence-based learning: emphasis on the ability to apply knowledge in practice (Zmeev, 2020).

- Andragogy: adult learners differ from children in that they are more motivated, but also expect learning to be directly relevant to their work (Knowles, 2020).

In retraining programs, the integration of these principles allows the educational process to become shorter yet more effective. Instead of focusing on abstract knowledge, learners immediately face typical professional tasks: designing a lesson, explaining a geographical concept, analyzing a map, or preparing a digital resource for class.

International experience confirms the effectiveness of practice-oriented retraining. In Finland, adult teacher retraining is organized around school-based practice from the first weeks of the program. In the UK, 'School Direct' provides an immediate immersion into classroom teaching with mentoring. In China, retraining programs are strongly linked to digital technologies and the use of online platforms, which accelerates skill acquisition (Zhou, 2021).

2. Problem field

Despite motivation, adult learners face serious difficulties when entering retraining programs:

- Low cartographic literacy: many cannot confidently use contour maps, scales, or GIS-based platforms.

- Superficial knowledge of educational standards: adult learners often struggle to understand the Federal State Educational Standard (FGOS) requirements.

- Difficulties in working with texts: semantic reading of geography textbooks, interpreting diagrams, and extracting information remain problematic (Letyagin & Pyatunin, 2022).

- Lack of pedagogical reflection: adult learners initially perceive geography as content delivery rather than activity facilitation.

These issues highlight the gap between academic knowledge and professional readiness, reinforcing the need for practice-oriented strategies.

3. Practice-oriented solutions

Based on teaching experience, several effective methods have been identified:

1. Micro-lessons: students conduct short lessons for peers, followed by discussion and feedback. This develops communication skills and confidence.

2. Lesson map design: learners prepare lesson plans using technological maps, ensuring compliance with FGOS standards and competence formation.

3. Case-based learning: typical cases include interpreting a natural disaster, planning a field trip, or designing a project on local climate. This format mirrors tasks in state exams (OGE, EGE).

4. Field practicums: excursions and outdoor classes allow learners to practice observation, data collection, and environmental analysis.

5. Digital projects: learners create interactive maps (Google My Maps), multimedia lessons (Tilda, Figma), and GIS-based presentations.

For example, one assignment required designing a 'local geography project' where participants analyzed their own neighborhood using maps, photographs, and interviews. Such tasks combine subject knowledge with methodological skills.

4. Role of digital resources

The digital dimension of geography education is especially important for retraining. Tools such as Google Earth, ArcGIS Online, and Moscow Electronic School enable interactive and visual learning experiences. Learners gain not only subject competence but also ICT skills necessary for modern classrooms.

A specific example is using Google Earth for analyzing tectonic plates or river systems. Adult learners prepare assignments where pupils must 'travel' across regions, observe physical features, and answer questions. Another example is Figma-based creation of infographic maps, which helps in visualizing demographic and economic data.

Digital resources bridge the generational gap between adult learners and their school students, aligning training with contemporary pedagogical demands (Letyagin & Pyatunin, 2023).

5. Diagnostics and assessment

Evaluation in retraining programs cannot rely solely on traditional exams. Instead, a multi-layered approach is needed:

- Self-assessment: learners reflect on their progress through weekly reports.
- Competence checklists: specific indicators (ability to design a lesson, conduct a micro-teaching, use maps) are tracked.
- Project tasks: learners develop cases, lesson plans, or digital maps as part of their assessment.
- Demonstration exam: the final stage includes conducting a mini-lesson or defending a digital project before peers and instructors.

This complex approach allows monitoring of professional growth and ensures readiness for teaching practice.

Conclusion

The practice-oriented approach is not an optional addition but a necessary foundation for retraining adults as geography teachers. It shortens the path from novice to practitioner, addresses motivational and cognitive barriers, and ensures compliance with educational standards. By integrating micro-lessons, cases, field practice, and digital tools, retraining programs produce teachers who are ready for the realities of modern classrooms.

The international experience, combined with domestic methodological innovations, shows that systematic practice-oriented training is the most effective way to overcome the shortage of geography teachers and to improve the quality of education.

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2007年与2008年出生EROFEY队青少年班迪球运动员体能指标对比分析

COMPARATIVE ANALYSIS OF PHYSICAL FITNESS INDICATORS OF YOUNG BANDY HOCKEY PLAYERS OF THE EROFEY TEAMS BORN IN 2007 AND 2008

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摘要。对2007年和2008年出生的叶罗菲队年轻班迪球运动员在比赛期间的体能和技术体能水平进行测试，结果表明，2007年出生的叶罗菲队球员的技术体能指标和多项体能指标与2008年出生的叶罗菲队球员相比，存在更显著的可靠性差异。

关键词：年轻班迪球运动员、一般和专项体能、竞技活动、教育和训练课程、全俄比赛决赛阶段。

Abstract. *Testing the level of physical and technical fitness of young bandy players of the Erofey team born in 2007 and 2008 during the competitive period showed a much better reliable difference in technical fitness indicators and many physical fitness indicators among the players of the Erofey team born in 2007 compared to the players of the Erofey team born in 2008.*

Keywords: *young bandy players, general and special physical fitness, competitive activities, educational and training sessions, final stage of the All-Russian competitions.*

Introduction

In preparation for the final stage of the All-Russian Bandy Competition in Ulyanovsk, from March 23 to March 30, 2024, the national team of the 2007 Erofey Olympic Reserve Sports School and the 2008 Erofey team, after the completion

of the stage of the All-Russian Bandy Competition in Novosibirsk, in addition to studying the indicators of psychomotor skills and psychoemotional state, the indicators of general and special physical fitness were studied [1,2].

The number of athletes of the 2007 Erofey team who took part in testing in mid-March 2024 was 16 people, and 17 people from the 2008 Erofey team.

Testing of general and special physical fitness indicators was carried out in the morning at the Arena-Erofey Regional Bandy Palace. To assess the level of physical and technical fitness of young bandy players, we selected tests that are control and translation standards according to the Federal Standard of Sports Training for the sport of "bandy".

Tests for assessing general physical fitness:

1. Running 100 meters.
2. Long jump from a place.
3. Running 3000 meters.
4. Shuttle run 3x10 meters.
5. Bending and unbending arms in a prone position.
6. Forward bend from the starting position while standing on a bench.

Tests for assessing special physical fitness:

1. Skating 30 meters.
2. Skating 60 meters.
3. Shuttle run on skates 6×9 meters
4. Figure eight in a radius backwards
5. Run in a figure eight 220 meters×10 circles
6. Dribbling 5 posts with a shot at the goal 30 meters, right hand
7. Dribbling 5 posts with a shot at the goal 30 meters, left hand

1. The experimental part

Over a two-month period (January-February 2024), players of the national teams born in 2007 and 2008 were engaged in warm-up exercises for 10-15 minutes in the preparatory part of the training session on average three to four times a week, improving technical and tactical training three times a week for 20-25 minutes, and also on average 3-4 times integrated training sessions for 20-25 minutes. Over a two-month period, the training process included exercise bike sessions for 30-40 minutes and standard positions were practiced in training sessions for 25 minutes four times.

When creating the model of preparedness of hockey players, a survey was conducted in the form of a questionnaire, in which 44 coaches took part, including 14 coaches of the Super League teams, 10 coaches of the Major League teams and 20 coaches working in sports schools for bandy. Based on the results of the questionnaire, problems in the process of competitive training of young bandy players were identified. An analysis was conducted to determine the relationship between

the indicators of different types of preparedness, and the research results obtained by us earlier were additionally used [3].

2. Results

When comparing the indicators of general physical fitness of young players of the Erofey team born in 2007 and Erofey team born in 2008, it was found that there was no reliable increase in indicators for the new competitive period, except for the indicator of flexion and extension of the arms in the prone position for players of the Erofey team born in 2008 compared to players of the Erofey team born in 2007 by 14.3% (Table 1).

Table 1

General physical fitness of young bandy players

Test name	Erofey 2007 $X_1 \pm m$	Erofey 2008 $X_2 \pm m$	Difference		p
			units	%	
100 meter run, seconds	12,80±0,3	13,06±0,	0,26	2	>0,05
3000 meter run, minutes.	12,26±0,4	12,43±0,4	0,17	1,4	>0,05
Bending and unbending arms in a prone position, number of times	42,0±8,0	48,0±2,0	6	14,3	<0,05
Shuttle run 3×10 meters, seconds	6,5±0,1	6,4±0,1	0,1	1,5	>0,05
Long jump from a place, centimeters	233,4±3,2	242,3±3,7	8,9	3,8	>0,05
Forward bend, centimeters	14,7±1,0	15,5±1,0	0,8	5,4	>0,05

It is worth noting that in the tests that assess the level of speed, the results were better for the Erofey team of 2007. In the test that assesses the strength of the arms, the results are significantly higher for those involved in the Erofey team of 2008. In the shuttle run 3x10 meters (agility) and forward bend from a standing position (flexibility), the values were approximately equal. In the test that assesses the level of speed-strength qualities, the values were higher for those involved in the Erofey team of 2008.

A somewhat different picture was noted when studying the special physical fitness (SPP) of players (Table 2).

Table 2

Comparative results of the study of special physical fitness

Test name	Erofey 2007 $X_1 \pm m$	Erofey 2008 $X_2 \pm m$	Difference		p
			units	%	
Skating 30 meters, seconds	4,46±0,09	4,11±0,09	0,35	7,8	<0,05
Skating 60 meters, seconds	8,25±0,10	8,09±0,11	0,16	1,9	>0,05

Shuttle skating 6×9 meters, seconds	13,44±0,12	12,82±0,22	0,62	4,6	<0,05
Figure eight in a radius backwards, seconds	12,20±0,08	12,25±0,15	0,05	0,4	>0,05
Figure eight running 220 meters×10 laps, minutes	5,17±0,03	5,18±0,05	0,1	0,1	>0,05
Dribbling 5 posts with a shot at the goal 30 meters, right hand	5,39±0,17	5,09±0,19	0,3	5,55	<0,05
Dribbling 5 posts with a shot at the goal 30 meters, left hand	5,40±0,13	5,18±0,14	0,22	4,1	<0,05

The results of 30 m skating and 6 x 9 m shuttle run improved significantly (7,8% and 4,6% respectively, $p < 0,05$). The results of dribbling the goalposts with a shot on goal improved by 4,1 – 5,5%. The figure-eight run remained virtually unchanged (0,1 – 0,4%).

When examining the results for each test, it was found that in 30 and 60 m skating (speed), 6 x 9 m shuttle run (agility) the results were better for those training in the Erofey team of 2008. In the figure-eight test backwards forward (agility) and in the figure-eight run 220 m x 10 laps the results were slightly better for those training in the Erofey team of 2007. In tests assessing the level of technical preparedness, the results were higher for those involved in the 2008 Erofey team.

Thus, some improvement in special physical preparedness can be noted for four out of seven indicators.

Expert assessments of hockey players at the end of the competitive period were excellent, which indicates sufficient effectiveness of the training methodology.

Analysis of the questionnaire data showed that the majority of surveyed coaches (65%) put the speed of movement and skate handling technique in first place, stick and ball handling technique in second place (58%), which, in their opinion, is the basis of competitive activity in bandy, the remaining indicators are rated somewhat lower (Figure 1).

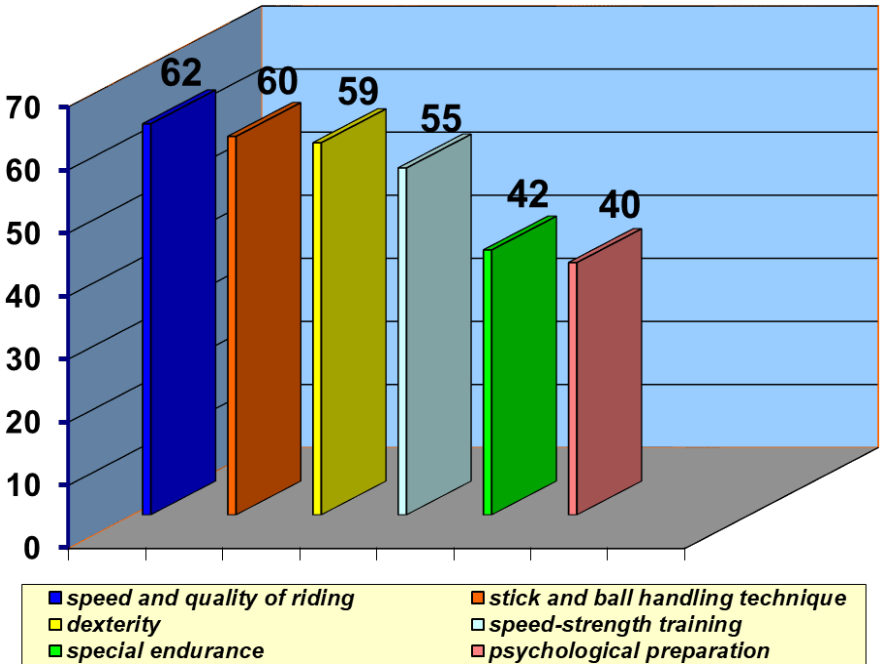

Figure 1. *Results of a survey of experts on the role of fitness indicators influencing the effectiveness of competitive activities of athletes in bandy (in %)*

3. Conclusion

Analysis of the general physical fitness indicators of the Erofey team players born in 2007 and 2008 showed a fairly high level of physical fitness of the players of both teams, but did not reveal any reliable differences, except for the indicator of flexion and extension of the arms in a prone position, which was much better for the Erofey team players born in 2008 compared to the Erofey team players born in 2007.

Analysis of the indicators of special physical fitness of the Erofey team players born in 2007 and 2008 showed a reliable difference in four indicators out of seven, much better for the Erofey team players born in 2008 compared to the Erofey team players born in 2007.

The results of the study showed that specialists working with hockey players of different ages and qualifications have different subjective opinions about the significance of indicators that affect the success of competitive motor activity in bandy.

Planning of competitive preparation should take place taking into account the identification of criteria for athletes' readiness for competitive activity and using a range of various pedagogical and medical-biological means (Figure 1).

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利用人工智能实现教育过程的个性化：开发助手的经验
THE USE OF ARTIFICIAL INTELLIGENCE FOR THE INDIVIDUALIZATION OF THE EDUCATIONAL PROCESS: EXPERIENCE IN DEVELOPING AN ASSISTANT

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摘要：本文探讨了开发和实施基于交互式人工智能助手以个性化教学过程的经验。文中介绍了项目理念、功能特性以及与学习环境的集成方法。文中特别关注了该解决方案的教学价值，包括提升学生学习积极性、减轻教师工作量以及利用数字工具进行绩效分析。

关键词：人工智能、交互式助手、个性化学习、教育数字化、教育科技、教学法、自适应学习。

Abstract. *The article discusses the experience of developing and implementing an interactive AI-based assistant to individualize the educational process. It presents the project concept, functional capabilities, and methods of integration into the learning environment. Particular attention is paid to the pedagogical value of the solution, including the enhancement of student motivation, facilitation of teacher workload, and performance analysis using digital tools.*

Keywords: *Artificial Intelligence, Interactive Assistant, Personalized Learning, Digitalization of Education, EdTech, Pedagogy, Adaptive Learning.*

1. Introduction

In recent years, there has been a growing interest in the development and implementation of artificial intelligence (AI) technologies across various professional fields, and education is no exception. The practical application of modern AI technologies in pedagogy provides an opportunity to discuss theoretical foundations and realistically forecast the prospects and potential challenges of large-scale implementation in the educational sector.

The foundation of the modern educational process lies in the dialogue between the learner and the teacher, aimed at joint development and organization of the

learning process. It is essential to consider the learner's individual interest in the presentation of educational material, their motivation for learning, and their application of acquired knowledge. The innovative focus of pedagogy is to reveal in the learner such resources that contribute to subjectivity, freedom of speech, and the manifestation of individuality [2].

The integration of AI in organizing the educational process can increase the efficiency of both teachers and students, highlighting three main areas: personalized learning, automation of reporting, and increased access to education. Personalized learning is one of the key advantages of AI in education. For instance, well-known educational platforms such as Duolingo and Khan Academy use automated content selection based on the learner's level of knowledge and needs, creating an individualized development trajectory for each user, thereby improving learning outcomes and motivation [1].

Moreover, the use of modern technologies allows teachers to focus directly on the teaching process by minimizing time spent on reporting, documentation, and designing individual learning plans annually. Automated grading of assignments and tests, lesson planning, and extracurricular activities provide teachers with more time for methodological engagement with students. Additionally, AI-driven assessment reduces the likelihood of errors and ensures objectivity in final evaluation.

It is important to note that the implementation of artificial intelligence (AI) in education faces several significant challenges. First, there are ethical considerations related to the use and processing of students' personal data. Second, there is resistance from educational institutions and educators, driven by adherence to traditional methods of teaching. Third, there are concerns from both educators and parents that students may become increasingly dependent on digital devices and less engaged with the real world around them. Furthermore, there is a risk that learners could become overly reliant on AI-generated recommendations and guidance, potentially undermining their ability to think critically and independently analyze tasks.

Nevertheless, despite the concerns expressed by participants in the educational process, artificial intelligence (AI) continues to gain momentum in this field. For instance, services such as MathGPT, which can either supplement or substitute for a mathematics tutor, Packback Questions, an intelligent interactive platform for teacher-student engagement, and Dystech, a tool for assessing students' reading skills [3], demonstrate the diverse applications of AI in education. The experience of such platforms illustrates the vast potential of AI integration into educational practices and highlights opportunities for refining AI-driven services to align with the objectives and needs of stakeholders in the learning process.

Objectives of this article: to present the experience of developing an AI-based assistant designed to support the individualization of the educational process; to

demonstrate the pedagogical value of AI implementation, including improved learner engagement, personalized instruction, and reduced teacher workload; and to identify prospects for project development and avenues for further research in the field of AI in education.

Tasks of this article: to analyze existing approaches to AI integration in educational environments; to outline the methodology for developing and implementing an AI assistant from a pedagogical perspective; to provide examples of the assistant's application in addressing real-world educational tasks; to evaluate the tool's effectiveness in terms of personalized and adaptive learning; and to formulate recommendations for the future development of such initiatives.

2. Project Description: AI-based Assistant

Concept and goals: the assistant is designed as a universal tool to support teachers and learners, enabling personalized learning while saving time on secondary tasks and generating reports on student levels and abilities. Its primary objective is to facilitate access to educational materials, support performance analysis, and provide recommendations for improving learning outcomes. The project's key uniqueness lies in offering essential resources for teachers within a single platform, featuring a personal account and convenient student reporting tools.

Functionality:

• generation of educational materials – creating assignments of varying complexity, lesson plans, quizzes, texts, and creative ideas tailored to specific knowledge levels and learning objectives;

• performance analysis and reporting – processing data on grades, student activity, and progress to identify strengths and weaknesses, with options to send summaries and recommendations to parents;

• interactive engagement – the assistant can act as a virtual mentor, answering questions, assisting with tasks, and sustaining learner interest;

• storage of generated plans and assignments for future use.

Technical Implementation: the project's frontend is built on the Tilda platform, providing a user-friendly interface and easy access to the assistant. Process automation is achieved via the Make service, linking the website to the AI model and other tools. The core AI functionalities are powered by models such as Gemini, responsible for text generation, data processing, and personalized recommendations.

3. Practical Implementation

The practical implementation of the project included several key stages: defining the assistant's tasks, developing the user interface, integrating artificial intelligence, and connecting external tools to ensure system stability.

User Interface Development: the main objective was to create an intuitive, visually appealing platform requiring no technical expertise to operate. The Tilda platform was chosen for its ability to produce adaptive web pages accessible from

multiple devices, with an emphasis on minimalist design, clear navigation, and a friendly assistant image.

AI Integration: the assistant is connected to an AI model (e.g., Gemini) capable of generating text, creating tasks, analyzing learning data, and providing recommendations tailored to the educational context.

Process Automation: Make serves as the middleware between the frontend and AI, ensuring data transfer and query processing without complex programming, thus reducing development time and increasing system reliability.

Pilot Testing: the assistant was tested on a limited sample of teachers and students, allowing assessment of material generation quality, data analysis accuracy, and usability.

4. Pedagogical Value

The use of an AI-based virtual assistant in education provides new opportunities for improving teacher efficiency and student engagement:

• increased student motivation – interactive engagement, visualization of information, and immediate feedback make learning more engaging;

• personalized tasks and recommendations – the assistant can adapt content to each learner's knowledge level and individual characteristics;

• reduced teacher workload – automating routine tasks (material generation, performance analysis) allows teachers to focus on creative and methodological work;

• analytics and progress forecasting – the assistant collects performance data, enabling tracking of learning dynamics and identification of problem areas.

5. Prospects and Future Directions

Further development of the project envisions expanding functionality and integrating new technologies:

• enhanced features – implementation of adaptive learning plans, voice interaction, and integration with Learning Management Systems (LMS);

• machine learning – enabling predictive analytics of student success and early identification of at-risk areas;

• versatility – adaptability to various age and language groups, subject areas, and educational formats, from school to corporate training.

6. Results and Conclusions

At the current stage, the project remains in active development but has already demonstrated several significant qualitative results:

• increased interactivity of the learning process – transforming traditional instruction into a more dynamic, engaging format through visualization and dialogue;

• improved material comprehension – pilot sessions indicated better retention when content is presented interactively and adapted to individual needs;

• reduced teacher workload – even at the experimental stage, the system showed potential in automating routine tasks (text creation, assignment suggestions, feedback);

• scalability prospects – the prototype demonstrates adaptability across age and language groups, subjects, and formats.

Key findings:

• AI can significantly enhance the efficiency of the educational process by personalizing teaching approaches and predicting student performance;

• automation of routine tasks reduces teacher workload, allowing focus on creative and methodological aspects;

• future development includes expanding functionality, integrating machine learning, and applying the assistant across diverse educational settings.

Conclusion: Despite its early stage, the project already demonstrates value to the educational sector and potential for scaling. Future plans include further functionality development, pilot implementations, and long-term impact assessment.

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STEM教育中的虚拟实验室：心理学理论协同框架
VIRTUAL LABORATORIES IN STEM EDUCATION: PSYCHOLOGY THEORY SYNERGY FRAMEWORK

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摘要：科学实验室课程对于STEM（科学、技术、工程、数学）教育中实现真正的学习至关重要，但传统实验室面临资源和安全问题，虚拟实验室（VL）应运而生。然而，由于虚拟实验室的技术能力与教育心理学理论之间缺乏充分的系统性互动，其教育效果并不一致，从而阻碍了其充分发挥教学效益。为了填补这一空白，本研究探索了虚拟实验室特性与基础教育心理学理论之间的动态互动，以提升STEM学习成果。本研究运用理论框架分析和来自中国和沙特阿拉伯的案例研究，发现虚拟实验室为STEM探究提供了必要的实践场景，其理论提供了重要的设计指导。案例分析验证了该框架，但也指出了关键的局限性：设计中理论与技术的分离，教师未充分利用虚拟实验室作为理论实施的载体，以及STEM环境中虚拟与物理的整合不足。因此，本研究提出了三项协同优化策略：根据STEM教育心理学理论微调虚拟实验室的技术特性、加强教师理论应用培训以及设计系统化的虚拟-实体转换。这些策略对于弥合理论与实践之间的差距、提升多维度的STEM学习成果以及为教育技术与教学实践的整合提供有益的启示至关重要。

关键词：虚拟实验室；STEM教育；教育心理学理论。

Abstract. *Science laboratory courses are indispensable in STEM (science, technology, engineering, mathematics) education for genuine learning, but traditional laboratories encounter resource and safety issues, giving rise to virtual laboratories (VLs). Nevertheless, the educational effectiveness of VLs is inconsistent due to a lack of adequate systematic interplay between their technological capabilities and educational psychology theories, which hinders their full pedagogical benefits. To fill this gap, this study explores the dynamic interplay between VL features and fundamental educational psychology theories to improve STEM learning outcomes. Using theoretical framework analysis and case studies from China and Saudi Arabia, the study finds that VLs supply necessary practical scenarios for STEM inquiry and the theories provide important design guidelines. The case analysis validated the framework but also*

identified key limitations: the separation of theory and technology in design, the under-exploitation of VLs as vehicles for theory implementation by teachers, and the poor virtual-physical integration in STEM settings. Accordingly, the study suggests three coordinated optimisation strategies: fine-tuning VL technical features according to educational psychology theories for STEM, strengthening teacher training on theoretical application, and designing systematic virtual-physical transitions. These strategies are vital for overcoming the theory-practice gap, enhancing multidimensional STEM learning outcomes, and providing useful insights for the integration of educational technology and pedagogical practice.

Keywords: *Virtual Laboratories*；*STEM Education*；*Educational Psychology Theories.*

1. Introduction

Laboratory courses in science are considered to have significant pedagogical importance in science education because they provide situated learning in realistic practical settings [1]. Experimental works are essential in all STEM (science, technology, engineering, mathematics) disciplines. However, traditional laboratories have resource limitations and safety issues. Therefore, virtual laboratories (VLs) have become increasingly popular in STEM education as a key approach to overcoming these difficulties. Nevertheless, the educational effectiveness of VLs has shown mixed results in current practices. On the one hand, some studies show that VLs can facilitate learning motivation and cognitive depth. For instance, Alhashem and Alfailakawi (2023) showed that pre-service teachers who received VL training had significantly higher learning interest and engagement [2]. Byukusenge et al. (2023) also proved that suitable pedagogical approaches could improve student performance in neurocellular knowledge acquisition by 69.6% [3]. On the other hand, other studies show that learning transfer is not ideal due to the mismatch between technological design and instructional requirements. Ibrahem (2022) revealed that oversimplified interfaces impeded reflective students deep thinking [4]. Hassan et al. (2022) pointed out that ignoring constructivist principles in collaborative task design reduced VLs to simple operational simulators [5]. At the heart of this contradiction lies the inadequate systematic synergy between VLs technological capability and educational psychology theories, thus restricting their full pedagogical exploitation. To fill this gap, this study proposes a dynamic interaction framework to enhance STEM learning outcomes through exploring (1) how VL features interact with educational psychology theories to support STEM learning; (2) the effectiveness and limitations of current VL practices in implementing theories in STEM contexts; and (3) strategies for improving VL design, teacher training, and tailored virtual-physical integration to effectively implement theories in STEM education.

2. Literature Review

2.1 Definition and Evolution of Virtual Laboratories

Virtual laboratories (VLs) are completely software-defined experimental environments based on computer simulation and virtualization technologies. They use interactive digital models to replace physical equipment, so that users can operate virtual systems through dynamic simulations. The VLs enable the visualization of complex phenomena, parameter tuning, and procedural repetition, thus promoting experiential learning without remote control of physical devices [6][7]. The technological development has significantly evolved the educational application of VLs. In the 1990s, VLs were localized substitutes to address the resource inequality and safety issues; for example, the V-Lab at Deakin University in Australia was used to overcome practical deficiencies caused by overcrowded physical laboratories, and played a vital supplementary role [8]. Later, the advancement of computer simulation and interactive technologies converted VLs from substitution tools to empowerment tools. By means of simulating high fidelity scenarios and real-time interaction, VLs helped learners to understand abstract concepts and internalize knowledge comprehension [6]. During the COVID-19 pandemic, VLs operated as emergency educational supports to relieve the restrictions on in-person experiments, and more than 90% of participants in relevant disciplines reported the learning benefits [9][10]. Additionally, VLs reduce costs, save time, and improve safety [11], which facilitates wider educational acceptance.

2.2 Educational Psychology Foundations for VLs in STEM

STEM education stresses on inter-disciplinary integration, problem solving and real world innovation. VL features naturally counterbalance weaknesses of traditional STEM education, resulting in a very high affinity. The pedagogical efficacy of VLs in STEM is strongly backed by fundamental educational psychology theories:

Constructivism: Jonassens constructivist theory suggests that knowledge is constructed by learners through their interactions with the environment, not passively received, requiring authentic contexts and opportunities for collaboration [12]. VLs are suitable carriers of this theory Alhashem and Alfailakawi (2023) divided 22 pre-service teachers into two groups to study organic chemistry, providing only the experimental group with VL training before the experiment. The experimental group exhibited significantly greater interest and engagement [2]. From a constructivist viewpoint, VLs provide inquiry-based environments for independent or collaborative experimenting and pattern discovery, turning learners into active knowledge constructors.

Cognitive Load Theory (CLT): According to Swellers CLT, the limited capacity of working memory necessitates instructional designs that reduce extraneous cognitive load and optimize intrinsic processing [13]. VLs are excellent

in this respect; a recent 2024 study involving 171 German tenth graders divided into three groups showed that only the target learning-value intervention group demonstrated longer fixation durations and larger saccade amplitudes during virtual biology lessons, which correlated positively with achievement, whereas blink duration correlated negatively with achievement [14]. This was due to the fact that the intervention enabled the students to concentrate on the essential content and to ignore irrelevant information, thereby reducing the extraneous load. At the same time, it facilitated optimal cognitive processing of the intrinsic nature, allowing for an effective distribution of working memory resources.

Self-Determination Theory (SDT): Autonomy, competence and relatedness are the basic psychological needs that should be satisfied for intrinsic motivation according to Ryan and Decis SDT [15]. There are VLs designed based on this theory. For instance, autonomy was satisfied by self-operated use, competence was satisfied by immediate feedback, and relatedness was satisfied by group discussion in the AI-based VL developed by Hesham Kawakneh et al.. The experimental group showed significantly higher mathematics motivation compared with the control group [16], which shows that the VLs can address the psychological needs of SDT accurately.

3. Theoretical Framework

3.1 Interaction Mechanism Between VLs and Educational Psychology Theories in STEM

The profound dynamic interplay between VLs and educational psychology theories is the key mechanism to elevate their educational efficacy. Firstly, educational psychology theories offer scientific underpinnings for designing VLs [17]. VLs should be designed according to the principles of constructivism, CLT, and SDT; Shah et al. (2024) proved the scientific validity of theory-embedded design [18]; Prasetya et al. (2023) showed that metaverse VLs could improve student competence and reduce face-to-face classroom hours [19]. Secondly, VL practice contributes to the development of theories [14]. Data collected from VLs can be used to test hypotheses, and VL scenarios can reveal new phenomena. Ferdinand et al. (2024) enriched theoretical frameworks [14]; Diwakar et al. (2023) validated the principles of SDT [20]. Such a dynamic co-construction is critical to unleash the potential of VLs and maintain the vitality of theories (see Fig. 1).

Figure 1. *The Mutual Influence Between Virtual Laboratories and Educational Psychology Theories*

3.2 Combined Impact on STEM Learning Outcomes

VLs and educational psychology theories enhance learning outcomes together. VLs use technology to enable access to complex systems and safe trial and error. Bazy et al. (2024) demonstrated their chemistry VL improved observational learning [21] and Byukusenge et al. (2023) reported a 69.6% performance gain through suitable pedagogy [3]. However, it is necessary to translate these opportunities into outcomes via theoretical guidance. Rosli et al. (2022) and Liu et al. (2022) validated the importance of theory in underpinning VL applications [22][23] and Reeves et al. (2021) highlighted that technology alone does not work [24]. Educational psychology theories also contribute to better outcomes via multiple channels and their combination with VLs produces synergistic effects. Therefore, substantial learning improvement is fundamentally based on their dependence and mutual reinforcement (Figure 2).

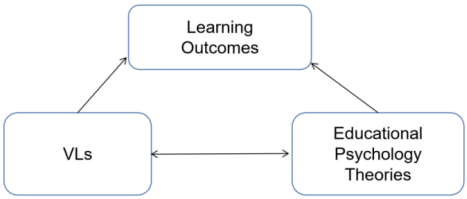
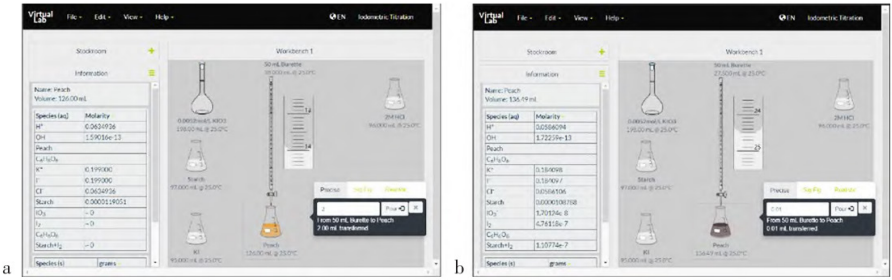


Figure 2. *The Synergy Framework of Virtual Laboratories, Educational Psychology Theories, and Learning Outcomes*

4. Case Studies

In this chapter, we apply the theoretical framework to some STEM education cases in China and Saudi Arabia. The research team analysed the case features according to the proposed theoretical dimensions and compared the outcomes of their implementations to assess their effectiveness and limitations. This analysis not only grounds the theories in specific STEM contexts but also examines the boundaries of the theoretical concepts.In China, the Chemistry Virtual Laboratory at East China Normal University follows the theory of self-directed learning where students design experiments themselves (see fig. 3) e.g. Vitamin C titration experiment and interpret their results. This allows for a dramatic increase in student led STEM innovation [25]. In Saudi Arabia, virtual science laboratories have a clutter-free interface with real-time safety warnings. During key STEM experiments, Cognitive Load Theory (CLT) is implemented. Understanding of experiments improved from 40% to 80%, interface satisfaction increased and the overall experience was enjoyable and rewarding [26] (Figure. 3).



a b

Figure 3. *Virtual Experiment: Titrimetric Determination of Vitamin C Content in Peach Juice[25]*

Table 1

Analysis of Student Learning and Experience with Virtual Science Lab (VSL). [26]

Evaluation Phase	Understanding of Core Concepts	Overall Experience
Pre-Test (HOL)	40% (Good Understanding)	—
Pre-Test (HOL)	60% (Difficulty Understanding)	—
Post-Test (VSL)	80% (Good Understanding)	Interesting & Satisfying

Both cases showed significant limitations, notwithstanding their successes. In the Chinese case, technical operational hurdles compromised learner autonomy. In the Saudi Arabian case, over-simplified interface design inhibited the transfer of STEM knowledge to real-life contexts and a lack of goal guidance weakened the motivational underpinnings of SDT for engaging in STEM. At its core, these limitations stem from technology-pedagogy misalignment and implementation gaps in STEM. They are manifested in terms of theory-agnostic designs which complicate operationally, overly simplified interfaces that prevent knowledge transfer, and teachers tool-focused biases that ignore theory integration in STEM pedagogy.

To address the aforementioned limitations, the following optimization proposals are presented: Firstly, virtual laboratory technical features should be fine-tuned for STEM learning according to educational psychology principles. Secondly, teacher training should be intensified to improve theoretical application abilities in STEM education. Thirdly, smooth transitions between virtual and physical experiments should be designed systematically in STEM contexts. Taken together, these measures will overcome the theory-practice dichotomy and close the identified implementation gaps.

5. Conclusion

This review suggests that the educational benefits of VLs in STEM arise from a dynamic interplay between their technological affordances and educational psy-

chology theories. VLs offer realistic contexts for STEM inquiry, and educational psychology theories can inform VL design. Empirical cases in STEM validate the framework, but also highlight key limitations. This will improve multi-dimensional STEM learning outcomes and provide transferable insights for bridging educational technology and pedagogy.

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瑞士联邦环境政策的历史视角
HISTORICAL PERSPECTIVE ON THE ENVIRONMENTAL POLICY OF THE SWISS CONFEDERATION

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摘要。相关性。环境议程在许多国家的政治纲领中占据重要地位。我们的未来取决于各国、国际组织、企业和其他参与者如何管理地球资源。通过明智的生态政策全面理解和及时评估环境问题，是及时预测风险并提出共同应对全球问题的方案的机会。因此，瑞士的经验在此发挥着至关重要的作用。研究目的。本文探讨了瑞士联邦实施环境政策的方法。作为实施“绿色”倡议的首要中心之一，瑞士在该领域拥有丰富的经验。本文旨在探讨瑞士绿色政策在历史上的演变，以及该国如何与世界分享其经验。所用材料。本研究借鉴了瑞士联邦在环境、土壤和水保护领域的广泛立法框架。本研究考察了瑞士联邦能源办公室（FOEN）的倡议、有害物质和废物防护法律、瑞士联邦能源局的提案、联邦委员会的决定，以及联合国、经合组织、国际能源署等国际组织和智库的数据库。

结论：本部分介绍了研究的主要结论。

关键词：瑞士、绿色政策、绿色转型、生态、环境、环境政策、回收利用、二氧化碳、水、土壤。

Abstract. Relevance. *The environmental agenda occupies an important place in the political programs of many countries. Our future depends on how states, international organizations, corporations and other actors manage the Earth's goods. A comprehensive understanding and up-to-date assessment of environmental problems through the wise ecological policy is an opportunity to predict risks timely and to propose joint solutions to global problems. The Swiss experience, therefore, plays not the least role here.* ***Purpose of the study****. The article examines the approaches of the Swiss Confederation to the implementations of environmental police. As one of the foremost centers for implementing «green» initiatives, the country has a wealth of experience in this area. The aim of the article is to examine, how Switzerland's green policy has changed in history and how this country can share its experience with the world.* ***Materials used****. The study draws on the Swiss Confederation's extensive legislative framework in the field of environmental, soil and water protection. It examines the FOEN's*

initiatives, laws on protection against harmful substances and waste, proposals of the Swiss Federal Office of Energy, decisions of the Federal Council, databases of international organizations and think tanks such as United Nations, OECD, International Energy Agency etc.

Conclusion. *This part presents the main conclusions of the study.*

Keywords*: Switzerland, green policy, green transition, ecology, environment, environmental policy, recycling, CO2, carbon dioxide, water, soil.*

Switzerland's favorable environmental situation is a credit to its aware inhabitants and authorities, who take care of their natural surroundings. The country has strict legislation protecting the nature, cleanliness of lakes and air. For 2025, Switzerland is one of the leading states in green policy, according to the OECD Better Life Index.[2] The key aspects of good life are shown in Fig. 1. We will consider three main aspects of this Index: rubbish legislature, initiatives related to air protection, and, of course, measures to maintain water balance and soil integrity.

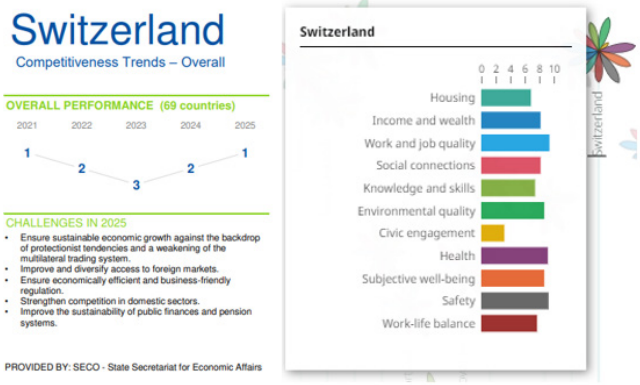

Figure 1. *OECD Better Life Index 2025. Switzerland is a strong leader in key well-being indicators*

Rubbish management. Sustainable ecological development is a trademark of this country, so the Federal Council (national government) and other governmental bodies are taking serious measures to preserve this legacy. There are some figures according to Federal Office for Environmental Protection (FOEN): around 1 million tonnes of plastic are consumed in Switzerland every day, around 790,000 tonnes of plastic waste are generated every year, around 83% of plastic waste is re-

[2] OECD Better Life Index. Available at: https://www.oecd.org/en/data/tools/oecd-better-life-index.html (last search: 15 August 2025).

covered for energy in incineration plants and around 2% in cement works. Around 9% is processed into recycled material, and 6% is reused.[3]

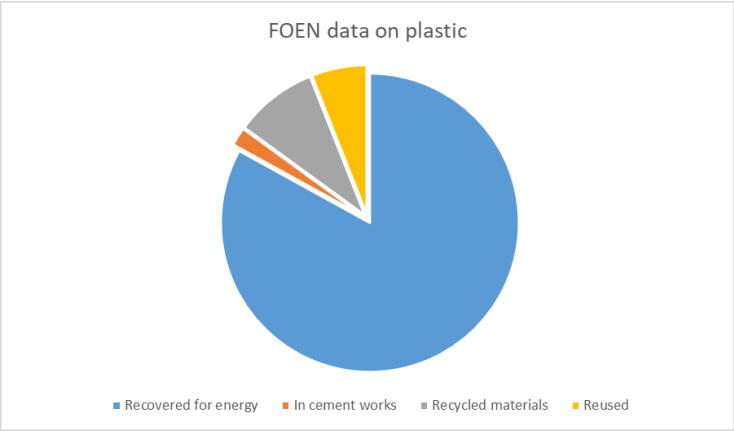

Table 1. *Approximate FOEN data on the annual amount of plastic*

Switzerland has a well-developed waste management system. For example, the country was one of the first to get rid of rubbish dumps. Law banned them in 2000. However, the situation was different in the second half of the XX century. In the 70-80s, there was no unified legislation on garbage. As a result, there was no more space for garbage in the country. To stop the unsettling tendency, the Federal Office for Environmental Protection (FOEN) was founded in 1971. Its key objective is to assess ecological risks.

In this situation, the government decided to create a separate collection of rubbish. A system of recycling garbage into energy was created. In addition, strict fines in litter were introduced. With the help of modern technology, the «garbage» police can easily figure out the violator by the contents of the bag. The impressive fine amount stops potential law offenders. The main principle of the Swiss waste collection policy is the «polluter pays» principle. This principle states that all costs of preventing and eliminating environmental damage should be borne by those who cause this damage. According to the Swiss principle of subsidiarity, the «polluter pays» principle applies at all levels – federal, cantonal and commune – and applies to both entrepreneurs and ordinary citizens.[4]

[3] Swiss Federal Office for the Environment. Waste treatment processes: Recycling. Available at: http://www.bafu.admin.ch/abfall/01495/01498/index.html?lang=en

[4] Butschi, Danielle and Cattacin, Sandro(1993) 'The third sector in Switzerland: The transformation of the subsidiarity principle',West European Politics,16:3,362 — 379

For those who don't want to deal with recycling, bags are sold, and the money from the sale of these bags going to sorting and recycling.[5] Switzerland has one of the most sophisticated separate waste collection systems in the world. Not all waste can be disposed of in the bin outside your home. In total, there are about 50 categories of rubbish.[6] Some of the categories of rubbish are: glass (may vary by the color), paper, plastic, metal and so on. Example tank designs for these categories can be seen in Fig. 2.

Figure 2. *Example of containers for separate waste collection*

After waste is collected, it is taken to recycling or incineration plants (around 30 plants across the country). The main criterion in selecting a location for such a plant is logistics. Therefore, such plants can be found both within the city limits and in the Alps.[7] In garbage disposal, all harmful substances are guaranteed to be destroyed. Heat is converted into energy by combustion. This is how electricity is generated for large population centers. The Swiss are guided by two principles at all stages of recycling: not to pass an ecological problems to future generations and to other countries. Switzerland willingly buys garbage from neighboring EU

[5] Stefano Carattini, Andrea Baranzini and Rafael Lalive, «Is taxing waste a waste of time? Evidence from a supreme court decision». London School of Economics, 2016. Available at: https://www.lse.ac.uk/GranthamInstitute/publication/taxing-waste/

[6] From the website RCYCLE.NET. Сортировка мусора в разных странах: Германии, Швеции, Финляндии, Швейцарии и других странах… // Rcycle.net: Все о переработке вторсырья и утилизации отходов. Available at: https://rcycle.net/musor/razdelnyj-sbor/sortirovka-othodov-v-raznyh-stranah?ysclid=megvyu84k8113396010#i-6

[7] Швейцария: страна, победившая свалки. Проект «Энергия из отходов». 2019. 15 июля. Доступно по ссылке: https://w2e.ru/blog/shveytsariya-strana-pobedivshaya-svalki/?ysclid=mecodv2wut436416052

countries. As a result, the country profits from other people's waste.[8] In 2016, new waste management regulations (VVEA) came into force. It allowed increasing the area of landfills in extreme necessity. In addition, special attention is paid to the recovery of phosphorus from water and flour.[9] It is important to follow safety precautions when burning rubbish. Moreover, cantonal waste planning measures are introduced to determine the energy potential of waste.

It is thanks to this policy that Switzerland has been able to avoid an environmental catastrophe and gain a strong position as a green country. Overall, there are many plans of Swiss government to improve current legislation in the recycling sphere. There is potential for improvement regarding the ecological footprint in all sectors of country's life

Quality of air. Climate change, global warming, air pollution is recognized as a big problem in Switzerland. According to the International Energy Agency, the Switzerland's average temperature has been climbing since 1864.[10] This trend is likely to continue. This may lead to the abnormally strong heatwave, especially in the south of the country. Given the overall level of energy consumption, the decline in demand for heating is likely to outweigh the increase in demand for cooling, leading to improved well-being and reduced carbon dioxide emissions.[11] Swiss legislation on air protection is quite diverse. The legislative acts and strategies underlying a sustainable and modern energy policy include: articles of the Federal Constitution relating to energy; the Federal Energy Act; the Federal CO2 Act; the Federal Act on the Use of Hydropower; the Federal Dam Act; the Federal Pipeline Act; the Federal Electrical Installations Act; the Federal Nuclear Energy Act; the Federal Electricity Supply Act; and the Energy Strategy 2050.

According to 2015 Paris Climate Agreement, global warming must be tackled. In this case, Switzerland has taken a number of measures aimed at reducing the overall temperature. Reducing the greenhouse effect and greening of territories are recognized as important. These measures will last until 2050.[12] Let us take a closer look at the history of Swiss air protection legislation.

[8] Transboundary movement of waste. FOEN Information brochure for applicants. Status 2025. Published by the Federal Office for the Environment FOEN. Bern, 2025. Available at: https://www.bafu.admin.ch/dam/bafu/en/dokumente/abfall/uv-umwelt-vollzug/grenzueberschreitender-verkehr-mit-abfaellen.pdf.download.pdf/UV-1702-E_VerkehrAbfaelle.pdf

[9] Verordnung über die Vermeidung und die Entsorgung von Abfällen (VVEA): Schritt zur Ressourcenschonung | Bundesamt für Umwelt. Available at: https://www.bafu.admin.ch/bafu/de/home/themen/abfall/revidierte-technische-verordnung-ueber-abfaelle--schritt-zur-res.html

[10] Switzerland Climate Resilience Policy Indicator // International Energy Agency. Available at: https://www.iea.org/articles/switzerland-climate-resilience-policy-indicator

[11] Ibid.

[12] Key aspects of environmental protection in Switzerland | Swiss Environment. May 29, 2020. Available at: https://houseofswitzerland.org/swissstories/environment/key-aspects-environmental-protection-switzerland

It was in Geneva, Switzerland, in 1979, that the European Convention on Long-range Transboundary Air Pollution was signed.[13] Several protocols have been adopted to the convention, among them a protocol on the funding of the Joint Monitoring and Assessment programme for Long-Range Air Pollutants in Europe. Swiss Confederation also became a participant in the programme.[14]

Switzerland has ratified the Kyoto Protocol adopted in 1997. The country has pledged to reduce carbon dioxide issues by 5.2% by 2012. This target has been successfully met. Yet the country's ecological policy was developing further.

In addition, the Energy Act has been in force in Confederation since 1999 (amended in 2023). It promotes the safe and rational use of energy. The Act regulates the production and supply of green energy to important businesses and homes, encourages green transition and environmental initiatives, solar panels, etc.[15]

Cooperation in the field of green energy and renewable energy sources with the EU has always been of great interest for the Swiss Confederation. The pivotal points are Swiss-Romanian (1999) and Swiss-Slovak (2000) joint projects on climate protection. Both projects were aimed at reducing CO2 emissions.[16] This programme SWAPP was designed to ensure Switzerland's active participation in environmental policy among other countries to reduce carbon dioxide emissions. In addition, starting from 2020, the EU and Switzerland exchange greenhouse gas emission quotas.

In January 2001, an energy program «Energy2000». Its aim was to stabilize fossil fuel consumption and harmful gas emissions.[17] Nowadays there is a program «SwissEnergy» that is active. This plan includes public information campaigns, consultations and training.[18] In 2018, a new programme strategy for 2021-2030 was approved by the Federal Council. It aims to develop renewable energy sourc-

[13] Конвенция о трансграничном загрязнении воздуха на большие расстояния. Принята 13 ноября 1979 г. Конвенции и соглашения ООН. Официальный сайт ООН. Доступно по ссылке: https://www.un.org/ru/documents/decl_conv/conventions/transboundary.shtml

[14] Обновленный справочник для Конвенции 1979 года о Трансграничном загрязнении воздуха на большие расстояния и ее протоколов. Официальный сайт Европейской экономической комиссии ООН. Доступно по ссылке: https://unece.org/sites/default/files/2021-06/ECE_EB.AIR_131_Ru.pdf

[15] Climate Change Laws of the world. Energy Act. Switzerland. 1999. URL: https://climate-laws.org/document/energy-law_37bd

[16] The Portal of Swiss Government. Schweiz und Slowakei starten gemeinsames Klimaschutz-Projekt. Staatssekretariat für Wirtschaft. Published on 21 March 2000. URL: https://www.news.admin.ch/en/nsb?id=9441

[17] Energy2000 Programme Switzerland (1991). Climate Policy Database. URL: https://climatepolicydatabase.org/policies/energy2000-programme

[18] The SwissEnergyPRogramme. Swiss Federal Office of Energy. URL: https://www.bfe.admin.ch/bfe/en/home/swiss-federal-office-of-energy/the-swissenergy-programme.html/

es, encourage enterprises to switch to green energy, and conduct vast informational campaigns.[19] To sum up, by 2000 Switzerland had taken a number of specific measures that strengthened its green policy.

In 2011 a new law was enacted in the country, CO2 Act. This act limits vehicle emissions into the air and the creation of emission quotas.[20] Also, companies can be exempted from the gas emission tax if they reduce their emissions. These companies are obliged to submit decarbonization plans and progress reports to the authorities.[21] In 2019, the Federal Council has set a new ambitious goal – the country must become climate-neutral by 2050.[22] Switzerland should not emit more gases into the air than it absorbs. This is a particularly relevant to the Confederation as it suffers from climate change – according to the International Energy Agency, temperatures are rising faster here than in the rest of the world.[23]

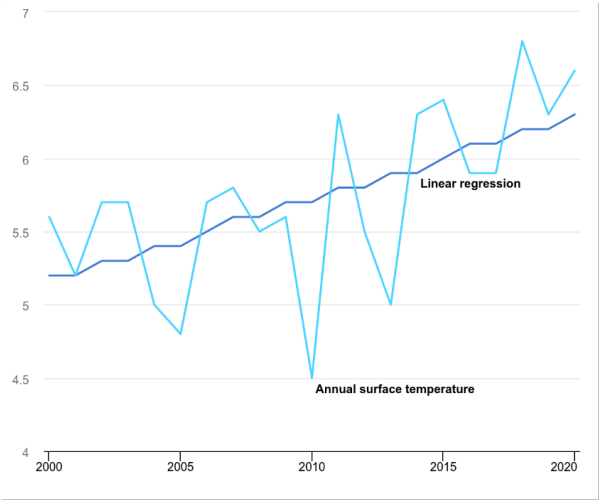

Table 2. *IEA Temperature in Switzerland, 2000-2020 table*

Support for industry and the commercial sector is of a great importance – they will receive support of 200 million franks (CHF) a year. The same support will be

[19] Programmstrategie EnergieSchweiz 2021 bis 2030. 16. Dezember 2019. Generalsekretariat UVEK. URL: https://www.bfe.admin.ch/bfe/en/home/swiss-federal-office-of-energy/the-swissenergy-programme.html/

[20] "Fedlex". *www.fedlex.admin.ch*. Retrieved 2023-04-27.

[21] Ibid.

[22] The Portal of the Swiss government. Federal Council aims for a climate-neutral Switzerland by 2050. Published on 28 August 2019. URL: https://www.news.admin.ch/en/nsb?id=76206

[23] Ibid.

given to homeowners if they replace traditional heating systems (such as gas) with wood or heat pumps.[24] Thus, CO2 emissions could be reduced by 95% by 2050 through existing measures and technologies.

In June 2023, the Swiss approved the Federal Act on Climate Protection, Innovation and Energy Security in a referendum. The law also sets goal of achieving climate neutrality by 2050.

In 2012, a new climate change strategy «Adaptation to climate change in Switzerland» has been released by FOEN. It identifies growing demand for electricity for cooling and declining hydroelectric power generation in summer as key issues.[25] FOEN also issued also published a report for 2017 entitled "Climate Risk Analysis for Switzerland" which identifies and prioritizes the risks and opportunities associated with climate change in Switzerland through 2060.[26]

Since 2020, the country has been implementing an Action Plan for the conservation of natural resources and the development of Switzerland's green economy, developed by The Federal Office for the Environment (BAFU). Financial and technological measures are envisaged to support environmental projects abroad.

On 16 August, 2025, for the first time in Switzerland, public transport in one of the cities, Geneva, has been made temporarily free of charge. The Geneva authorities made this decision due to a sharp increase in harmful ozone, which has reached dangerous levels. Ticket sales have been suspended, and public transport is available to everyone until the environmental situation improves. Only low-emission vehicles are now allowed to enter the center of Geneva.[27] This is a unique experience that has never been seen before. Thus, by 2035, Switzerland must reduce greenhouse gas emissions by at least 65% compared to 1990 levels, primarily through domestic measures. Between 2031 and 2035, greenhouse gas emissions must be reduced by an average of 59%.[28]

[24] Federal Office for the Environment FOEN. 2050 net-zero target. URL: https://www.bafu.admin.ch/bafu/en/home/topics/climate/info-specialists/emission-reduction/reduction-targets/2050-target.html

[25] Adaptation to climate change in Switzerland - First part of the Federal Council's strategy. Adopted on 2 March 2012. Federal Office for the Environment FOEN. URL: https://www.bafu.admin.ch/bafu/en/home/topics/climate/publications-studies/publications/adaptation-climate-change-switzerland-2012.html

[26] Climate Risk Analysis for Switzerland. Federal Office for the Environment FOEN. URL: https://www.bafu.admin.ch/bafu/en/home/topics/climate/publications-studies/publications/klimabedingte-risiken-und-chancen.html

[27] Копцова В. Бесплатный транспорт и запрет на машины: жители Женевы в панике — что на самом деле происходит с воздухом. 16.08.2025. Журнал об экологии Экосевер. URL: https://www.ecosever.ru/news/48487.html

[28] Climate: Federal Council approves new reduction targets under the Paris Agreement. The portal of the Swiss government. Published on 29 January 2025. URL: https://www.news.admin.ch/en/nsb?id=103949

Quality of water and soil. Given the small size of the country, soil is very valuable to the Swiss. However, there are abundant water resources. Switzerland is also known as the "land of lakes" or "Europe's reservoir". Citizens treat soil and water with care. Soil is often subject to erosion, and water to pollution. To ensure that future generations have access to these natural resources, the government has taken a number of measures.

The aforementioned Action Plan for the conservation of natural resources (2020) provides for the restoration of contaminated land. It is necessary to restore the original environmental indicators—soil and water—and to reclaim contaminated land.

Also in 2020, the Federal Council adopted the Swiss Soil Strategy. The goal of the strategy is to halt soil degradation by 2050. It is planned to optimize sowing operations.[29] In addition, the government has established a special center to collect information on soil conditions throughout the country. This has resulted in the development of a digital map of the country's soils, with information on their suitability for various types of work, crops, etc. (Fig.3).

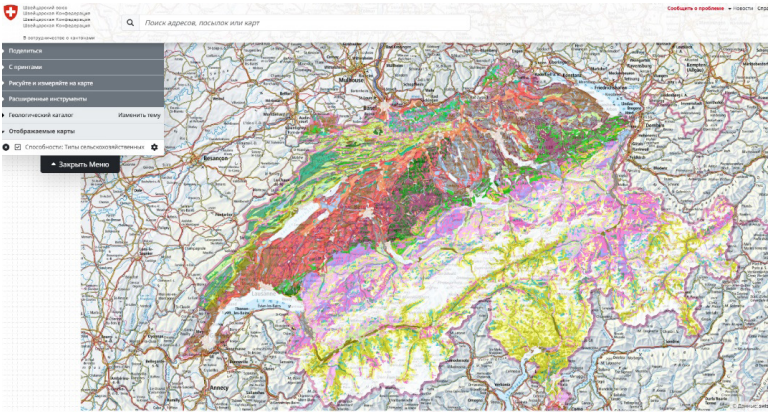

Figure 3. *Maps of Switzerland (map.geo.admin.ch) with crop types*

The data obtained is used to more accurately assess soil conditions and take targeted measures for rational soil use.

Switzerland has unique and picturesque landscapes. However, many lands are in decline. In 2020, the country's authorities renewed Swiss Landscape Concept, which existed since 1997. This document regulates the rational use of land, methods of development and construction, and assesses the risks involved in the con-

[29] Swiss National Soil Strategy. Federal Office for the Environment FOEN. URL: https://www.bafu.admin.ch/bafu/en/home/topics/soil/swiss-national-soil-strategy.html

struction of houses, industry, and tourist sites. That is why the country's planning is so well thought out.[30]

As for water resources, there are plenty of them. Switzerland has many large rivers, such as the Rhine and the Rhone, as well as a large number of lakes: Lake Geneva, Lake Constance, Lake Maggiore, Lake Lucerne and many others. These places are of great interest to tourists and their preservation is a priority. In 1966, a Federal Act on the Protection of Nature and Cultural Heritage (NCHA) was adopted to ensure safety of biodiversity and water resources.[31] In 1991, the Federal Law on the Protection of Water Resources in Switzerland was passed. It stipulates that the federation develops general recommendations, while the cantons take specific measures to protect water.[32] In 2004, a Practical Guide to Groundwater Protection (Wegleitung Grundwasserschutz) was published. The document regulates the quality of groundwater.[33] In addition, the country is creating monitoring systems to control water bodies. For example, there is the NAQUA National Groundwater Monitoring System, which tracks around 600 groundwater bodies. Human activity is also assessed.[34] The National Surface Water Quality Monitoring Programme (NAWA) pursues a similar goal. The FOEN, in cooperation with the cantons, monitor the state of rivers.[35] All of the measures mentioned for protecting soil and water are designed to raise awareness among the Swiss public about the state of nature in the country and to provide recommendations for the future.

Conclusion. We have only looked at some of the environmental protection mechanisms that exist in Switzerland. In reality, each canton has its own unique experience in protecting biodiversity. Switzerland has an exceptionally rich biodiversity. As a result of measures implemented annually by the Confederation, cantons and municipalities, pollution levels are decreasing. However, it is important to continuously improve environmental protection systems, existing legisla-

[30] Swiss Landscape Concept. Federal Office for the Environment. URL: https://www.agrarforschungschweiz.ch/en/1998/07/landscape-concept-switzerland-sustainable-use-of-rural-spaces/

[31] Federal Act of July 1, 1966, on the Protection of Nature and Cultural Heritage (status as of 1 April, 2020). Available at: https://www.wipo.int/wipolex/ru/legislation/details/20006

[32] Участие общественности в управлении речными бассейнами в Швейцарии. Борьба с наводнениями. При поддержке Швейцарского управления по развитию и сотрудничеству. Ташкент. 2011. URL: https://cawater-info.net/library/rus/carewib/swiss_water.pdf

[33] Wegleitung Grundwasserschutz. Bundesamt für Umwelt, Wald und Landschaft BUWAL. Bern, 2004. URL: https://www.bafu.admin.ch/bafu/en/home/topics/water/water--publications/publications-water/wegleitung-grundwasserschutz.html

[34] NAQUA National Groundwater Monitoring. Federal Office for the Environment FOEN. URL: https://www.bafu.admin.ch/bafu/en/home/topics/water/groundwater/naqua-national-groundwater-monitoring.html

[35] National Surface Water Quality Monitoring Programme (NAWA). Federal Office for the Environment FOEN. URL: https://www.bafu.admin.ch/bafu/en/home/topics/water/state-of-watercourses/national-surface-water-quality-monitoring-programme--nawa-.html

tion and programmes, and, more importantly, to share experience with foreign partners. Only by working together can countries preserve our planet for future generations.

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残疾人职业融入的年龄相关特征
AGE-RELATED FEATURES OF PROFESSIONAL INCLUSION OF PERSONS WITH DISABILITIES

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注释：本文探讨了残障人士职业包容的年龄相关特征。作者提出了一个诊断方案，并确定了评估指标的标准。文章内容展现了不同年龄段残障人士职业包容的不同趋势和相似趋势。

关键词：残障、包容性、职业包容性的各个方面、职业文化、应对行为、职业倦怠风险。

Annotation. *The article examines age-related features of professional inclusion of persons with disabilities. The author proposes a diagnostic program with identified criteria for assessing indicators. The text of the article presents material that shows different and similar trends in the professional inclusion of persons with disabilities of different ages.*

Keywords: *disability, inclusion, aspects of professional inclusion, professional culture, coping behavior, risk of developing professional burnout.*

Disability– is a violation of human health with a persistent disorder of body functions caused by diseases, consequences of injuries or defects, leading to a limitation of life activities and causing the need for social protection [1,2].

Disability significantly changes the conditions of the social situation of human development: the quality-of-life changes, the level of income falls, the opportunities for active participation in various areas of social life are reduced.

Inclusion (from the Latin inclusio – "inclusion, involvement") is an important process of transformation of modern society. It means the active inclusion of all people, regardless of their characteristics, in public life, professional activity, education, etc.

This is a process of real inclusion in the active life of society of people with difficulties in physical development, including those with disabilities or limited health capabilities (LHC).

Currently, the following types of inclusion are distinguished: social, professional, leisure, educational, financial, political, economic.

It is relevant to study the specifics of professional inclusion depending on the age of persons with disabilities.

To study age-related characteristics, we conducted an experimental study on professional inclusion of persons with disabilities at the Cherepovets State University.

The general population included 52 people. Of these, 35 people with disabilities who completed all stages of the study formed a representative sample. We identified two age groups: group A - disabled people 23-35 years old (21 subjects), group B - 37-41 years old (14 subjects).

Most of the subjects have musculoskeletal disorders of traumatic origin. To study professional inclusion in persons with disabilities, we developed a diagnostic program (Table 1).

Table 1

Diagnostic program

Contexts of professional inclusion	**Target**	**Methods and techniques**	**Evaluation criteria**
Satisfaction with inclusion	Reveal Features of satisfaction with inclusion	Questionnaire “Satisfaction with professional inclusion” (according to V.N. Ponikarov, N.A. Davydova) and others.	Completely satisfied Partially satisfied Not satisfied
Professional culture	To identify the features of professional culture	Projective methodology «Professional culture» (according to V.N. Ponikarova) and others.	High level of professional culture Average level of professional culture Low level of professional culture
Professional coping behavior	Reveal Features of professional coping behavior	Questionnaire «LHS» (according to V.N. Ponikarova) and others.	Life-coping Hard-coping Soft-coping
Frustration tolerance (to professional burnout)	To identify the characteristics of frustration tolerance	Projective methodology «Professional culture» (according to V.N. Ponikarova) and others.	High level of development of professional burnout Average level of professional burnout development Low level of professional burnout development

The diagnostic program examines various aspects of professional inclusion: satisfaction with inclusion, professional culture, professional coping behavior and frustration tolerance (risk of developing professional burnout).

The experimental method, projective method, survey method and methods of mathematical statistics were used.

Each aspect is studied using a set of complementary methods and corresponding evaluation criteria.

The results of the study of satisfaction with inclusion are presented in Table 2.

Table 2

Results of the study on satisfaction with inclusion

Satisfaction with inclusion	**Group A**	**Group B**
Completely satisfied	24	21
Partially satisfied	33	43
Not satisfied	43	36
Statistical significance	$\chi 2 = 5.99$ ατ $\pi < 0.05$	

It can be noted that the results of satisfaction with inclusion do not differ significantly. However, in Group A, approximately half of the respondents are not satisfied with inclusion, while in Group B, 43% of respondents showed partial satisfaction.

The statistical significance of the results according to the c2 criterion between the two samples is c2 = 5.99 at p< 0.05 (significant at the trend level).

The rating results of the study (according to the criterion of complete satisfaction) of various types of inclusion are presented in Table 3.

Table 3

Rating results of the study various types of inclusion

Types of inclusion	**Group A**		**Group B**	
	X	**Rank**	**X**	**Rank**
Social inclusion	10	1	36	4
Professional inclusion	29	5	50	6.5
Leisure inclusion	14	2.5	29	3
Educational inclusion	33	6.5	-	1
Financial inclusion	24	4	21	2
Political inclusion	33	6.5	43	5
Economic inclusion	14	2.5	50	6.5
Statistical significance	$r=0.78$, $\rho \leq 0.05$			

The obtained results allow us to conclude that in Group A the greatest dissatisfaction is caused by social inclusion, leisure inclusion and economic inclusion, while relatively high indicators were obtained for educational and political inclusion.

In Group B, the lowest ranks were obtained for educational and financial inclusion indicators. Relatively high ratings were noted for professional and economic inclusion indicators.

The use of the Spearman correlation coefficient shows the presence of a direct positive dependence on the age of the subjects (significant at the trend level).

The results of the study of professional culture are presented in Table 4.

Table 4

Results of the study of professional culture

Level of professional culture	Group A	Group B
Low level	24	21
Intermediate level	48	50
High level	28	29
Statistical significance	It does not matter	

The results of the study of professional culture allow us to conclude that in both samples the majority of respondents have an average level of professional culture. In general, the indicators of professional culture do not differ significantly across the group.

No statistically significant differences were found between the samples.

The rating results of the study of professional culture are presented in Table 5.

Table 5

Rating results of the study professional culture

Professional situations	Group A		Group B	
	X	Rank	X	Rank
Absence from work due to illness	10	1	21	1
Communication with management	24	3.5	50	6
Leisure communication with colleagues	14	2	29	2.5
Communicating with colleagues about professional activities	43	6	36	4
Communication with the administration	24	3.5	43	5
Direct professional activity	33	5	29	2.5
Statistical significance	$r=0.85$, $\rho \leq 0.05$			

The analysis of situations of professional activity shows that the greatest tension in the implementation of professional activity in group A is caused by com-

munication with colleagues regarding professional activity and direct professional activity. In group B, such problematic situations are professional communication with the management and professional communication with the administration.

The least stressful situation in both samples is absence from work due to illness.

The use of the Spearman correlation coefficient shows the presence of a direct positive dependence on the age of the subjects (significant at the trend level).

The results of the study of professional coping behavior are presented in Table 6.

Table 6

Results of the study of professional coping behavior

Typology of coping behavior	**Group A**	**Group B**
Life-coping	50	21
Hard-coping	33	43
Soft-coping	17	36
Statistical significance	$\chi 2 = 24.1$, $\alpha\tau\ \pi < 0.01$	

The study of professional coping behavior allows us to note that the leading type of coping in group A is Life-coping, while in group B Hard-coping predominates.

The statistical significance of the results according to the c2 criterion between two samples is c2 = 24.1 at p< 0.01.

The results of the study of the risk of developing professional burnout are presented in Table 7.

Table 7

Results of the study of the risk of developing professional burnout

Risk of developing professional burnout	**Group A**	**Group B**
Low level	17	21
Intermediate level	35	50
High level	48	29
Statistical significance	$\chi 2 = 14.89$, $\alpha\tau\ \pi < 0.01$	

The obtained results allow us to note that the risk of developing professional burnout is approximately the same in both samples.

Moreover, a low level of risk is observed mainly in group B, while in group A almost half of the respondents demonstrate a high level of professional burnout.

The statistical significance of the results according to the c2 criterion between the two samples is c2 = 14.89, with p< 0.01.

Age-related features of professional inclusion are presented in Table 8 [2, p.88].

Table 8

Age-related features of professional inclusion

Contexts of professional inclusion	Group A	Group B
Satisfaction with inclusion	Partially satisfied Professional inclusion Political inclusion	Partially satisfied Professional inclusion Economic inclusion
Professional culture	Intermediate level Communication with colleagues regarding professional activities Direct professional activities	Intermediate level Communication with management Communication with administration
Professional coping behavior	Life-coping	Hard-coping
Frustration tolerance	High risk of developing professional burnout	Average level of risk of developing professional burnout

It can be noted that similar trends are noted in the context of satisfaction with inclusion and professional culture, while professional coping behavior and the risk of developing professional burnout demonstrate similar trends.

Thus, the most statistically significant results were obtained for the following indicators: risk of developing professional burnout and professional coping behavior. The least significant difference was noted for the professional culture indicator.

Consequently, the study of professional inclusion shows differences between people with disabilities and people with normotypic development, as well as according to the criteria of the stage of professional development, gender and age [1, p.46].

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日本乳制品的文化史
THE CULTURAL HISTORY OF DAIRY IN JAPAN

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摘要：本文探讨了受宗教习俗、农业传统和文化偏好的影响，乳制品在日本饮食中的历史缺失。几个世纪以来，乳制品仅限于精英阶层消费，并在12世纪后几乎消失。明治时期，作为政府主导的现代化进程的一部分，乳制品被重新引入，以推广西方食品。尽管推广，但文化障碍（例如对发酵乳制品气味的厌恶）阻碍了乳制品的广泛普及。如今，乳制品在日本很常见，但仍然集中在酸奶和冰淇淋等特定产品上，这反映出日本对西方乳制品文化的独特适应，而非完全照搬。

关键词：日本、乳制品、牛奶、饮食史、饮食、明治时代、酸奶、奶酪、饮食文化。

Abstract. *This article explores the historical absence of dairy products in the Japanese diet, influenced by religious practices, agricultural traditions, and cultural preferences. For centuries, dairy was limited to elite consumption and virtually disappeared after the 12th century. It was reintroduced during the Meiji era as part of government-led modernization efforts to promote Western foods. Despite promotion, cultural barriers—such as dislike of the smell of fermented dairy—slowed widespread adoption. Today, dairy is common in Japan but remains focused on specific products like yogurt and ice cream, reflecting a unique adaptation rather than full adoption of Western dairy culture.*

Keywords: *Japan, dairy, milk, food history, diet, Meiji era, yogurt, cheese, food culture.*

Lack of dairy products.

The spread of Buddhism and Shintoism may be an excellent explanation for why, at a certain period in Japan's history, meat products disappeared from the diet. A determining factor may also be the fact that agricultural Japan did not specifically raise livestock for the production of dairy and meat products.

In central China, Korea, and South Asia, there was one cow and horse per family. Large herds of animals were raised in Central Asia, where dairy products played a major role in the life of the population. In China, regions north of the Chi-

nese Great Wall, but not to the south, were considered dairy regions. Originally, the Great Wall was built for the sole purpose of keeping out nomads from entering China, and their diet was based on raising cattle for food. Milk was drunk in areas south of the Great Wall, in Tibet, and also in southeastern China, in regions not belonging to the Chinese khan.

The bulk of domestic animals raised in China since ancient times have been pigs and chickens. Sheep were raised in the northern regions, more for meat than for milk, and ducks in the south. It was these farmers who tried to increase the herds of livestock raised and the number of poultry raised. The rice crop that came to Japan during the Yayoi period included pigs and chickens, but not sheep and ducks. At the same time, however, these types of meat were rarely consumed, as only a few archaeological finds of the bones of these animals, compared to those of wild boars, can attest. In "Nihonshyoki", a chronicle compiled in the XVIII century, it is said that since the V century there were special yards, which belonged to the imperial court, for the cultivation of pigs. This shows that there were peasants who practiced animal husbandry.

In all agricultural cultures that raise livestock to consume as part of their daily diet, there is a social system that helps in raising livestock and poultry. The agricultural culture of ancient Japan had no such system, so relied heavily on hunting as a means of obtaining meat. This is why the population did not consume meat as a daily food.

Dairy products were not widespread in East Asia and therefore played a very small role in the daily diet, but this is not to say that dairy products were not favored as a daily food. The oldest records concerning milk in Japan are associated with Zenna, a man of Chinese descent who came to Japan from the Korean peninsula and introduced milk to the Empress, and later became a court physician with the title *Yamato-no-kusuri-no-omi*. The first mention of dairy production dates back to year 700 to the empress's order. In order for courtiers to start consuming milk, in the VIII century, the court physicians' society hired peasants to raise milk-producing cows. The number of animals raised for this purpose was not small, according to "Engishiki" in the X century there were 1,500 such animals in Japan - that means one animal per 4,000 people. In comparison we can cite the fact that in year 1975 one cow per 50 people, and also a large amount of dairy products were imported. All this may indicate that dairy products were not part of the diet of the Japanese in ancient times (Susumu, 1980).

As Hanegawa notes, "dairy farming in ancient Japan was the exclusive prerogative of the imperial court and aristocracy, and its scale was extremely insignificant compared to agriculture" (Hanegawa, 2009).

In ancient Japan, the only known dairy product was the so-called *so* - it is similar to Russian yogurt or soured milk.

Milk was consumed only by a layer of aristocracy close to the imperial court, and during the coup in the XII century disappeared from the menu altogether. It was not until the XVII century that milk was discovered as a product, with the help of people who studied Dutch literature on science and medicine. In 1727, the Shogun acquired the first cows brought to him by Dutch traders and their further breeding took place.

Milk from these cows was drunk with sugar, and small quantities of butter were produced, which was consumed only by the Shogun and his cronies. Dairy products were not part of the daily diet of the Japanese until the twentieth century.

Milk and dairy products.

The production of dairy products began in 1863, when a Japanese man who worked for a Dutch dairy store serving foreigners in Yokohama opened his own store for his countrymen. He opened another store in Tokyo and was invited to teach milk and dairy products at the state-owned "Gyuba Kaishya Company", which had a monopoly on milk and meat production but lasted a very short time. As his apprentices began opening stores across the country after graduation, milk became available in provincial towns as well by the year 1870 (Susumu, 1980). Still, the government played a large role in the development of the dairy industry. "Gyuba Kaishya" launched a large-scale propaganda for dairy products, which talked about the health benefits of milk and dairy products. For example, there was the following slogan: "The cheese, butter, powdered milk and condensed milk produced in our factory is aimed at increasing the consumption of milk by the nation. The benefits of milk far exceed those of beef! Milk is an excellent medicine for patients with colds or pulmonary tuberculosis, and it can also be considered a universal cure for all diseases. To feel the effectiveness of milk, it should be used not only as medicine but also as a daily food, just as people in the West do, and cheese and butter should be used in our country's cuisine on a pair with the use of 鰹節 (かつおぶし - "katsuobushi" - dried tuna)." This approach was part of the state policy of Modernization and Westernization, as Smil writes: "Meiji-era Japanese reformers promoted milk and meat as products necessary for strengthening the nation's physique and its competitiveness with the West" (Smil, 2013).

In the early Meiji period, milk-producing cows were kept on farms in or near cities, and the milk was brought to the customer in iron cans and sold by the ladle. The pasteurization method entered Japan after year 1900, only a few years after it began to be used in the West, and then milk began to be delivered in glass bottles. Women who breastfed but had little milk used cow's milk. In regions where cows were not yet raised, the milk was delivered in sealed bottles and advertised as: "You don't need a nurse!". In addition to children who were fed milk, it was also drunk by the sick or people with poor health.

Dairy products produced in Japan before World War II were limited to whole and condensed milk, and powdered milk was introduced in year 1920. Solid dairy products, on the other hand, were not very popular, with the exception of ice-cream. Just as Europeans disliked Japanese soybean-based foods such as *natto* and *miso* because of their unpleasant odor, the Japanese also found the fermentation technology used in the production of dairy products unpleasant and unsuitable for their food. “Stinky butter” (バター臭い！) was an expression that could be heard in the late Edo and early Meiji eras for Japanese who were trying to adopt European traditions. Culinary anthropologist Ishii confirms this, noting: “The perception of the smells of fermented dairy products, particularly butter and cheese, presented a significant cultural barrier for the Japanese, whose own fermented products had a completely different spectrum of aromas” (Ishii, 2018). Until Japan began making its own butter in 1930, it was imported from the West and became rancid during the long travel time. Butter and cheese production began in the 1970s when large numbers of Japanese began eating bread for breakfast. Still, most Japanese preferred unleavened cheese and only a few preferred natural cheeses, which had specific flavors.

Despite all this, dairy products appeared in Japan more than 100 years ago, but, of course, this is much later than in countries with a developed dairy culture. Still, the consumption of milk in Japan is mostly limited to various milk-based drinks and desserts, such as ice-cream, but recently yogurts, both drinkable and plain, have become popular. As Franthum summarizes in his research on modern food trends: “The consumption of dairy products in Japan is now firmly established, but it has taken on a unique local form, focusing on convenient-to-consume yogurts, desserts, and functional foods, rather than traditional Western cheeses and creams” (Franthum, 2020).

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中国文化研究语境中的诠释学方法
HERMENEUTIC APPROACH IN THE CONTEXT OF CULTURAL STUDIES OF CHINESE CULTURE

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摘要：本文探讨了中华人民共和国理论研究的问题，以及现代诠释学方法在中国文化文物研究中的应用。

关键词：文化、道德、价值观、诠释学、阐释、经典、文本。

Abstract. *The presented article examines the issues of theoretical research of the PRC, subject areas of modern hermeneutic approaches in the study of artifacts of Chinese culture.*

Keywords: *culture, morality, values, hermeneutics, interpretation, canon, text.*

Since China actively implemented the reform and opening-up policy in 1978, the country has gone through a long journey of social development with Chinese characteristics under the leadership of the Communist Party. More than forty years of reform and sustained economic growth have transformed China into an advanced economy in the world and brought about many profound changes in Chinese society. These historically significant events have attracted increasing attention from scholars, governments and the general public around the world since the 1990s, when a new wave of China studies has been intensified. The most relevant topics include the so-called «China miracle», «China phenomenon», «Chinese experience», «Chinese way» and «China model», exploring which provides an opportunity to form a deep understanding of contemporary China and what is special about China's past and present that may mean not only for its future but also for the future of the world.

The research in this area includes both theoretical research and empirical studies, and covers the economy, society, politics, law, ecology and culture, which have been deeply influenced by the reform and opening-up policy and have determined the future development prospects.

The relevance of cultural studies of Chinese culture is due to its antiquity, uniqueness and significant influence on world history and modern society. Chinese civilization, one of the oldest in the world, has a rich heritage in philosophy, art, science and economics, which continues to influence global social processes.

Chinese culture, which is more than five thousand years old, is a unique system in which traditions, customs, art and philosophy are closely intertwined. One of the characteristic features of Chinese culture is that for thousands of years the country developed in complete isolation from the centers of world civilization. Therefore, historically, the Chinese have always considered themselves as the "middle kingdom", which is the center of the entire civilized world. This formed a unique socio-cultural self-identification of the nation. Despite long-term isolation, Chinese culture successfully developed, ahead of the West. To a large extent, this was due to the functioning of moral value systems, which were elevated to immutable rules of behavior. The value foundations of traditional Chinese culture were formed back in the era of the Eastern Zhou Dynasty. The long existence of traditional socio-cultural ideas formed the fundamental values of Chinese society, namely the desire for state stability, harmonious social relations with other countries and with nature.

Social harmony and personal well-being are achieved by adhering to the principles of Confucian social order. Accordingly, the modern direction of cultural studies, influenced by neo-Confucian ideology, consists in maintaining the previous traditional ideas of public and personal, stability of society, moderate cyclical changes, and steadfast adherence to traditional socio-cultural rules and rituals.

In recent years, many researchers have attempted to unravel the historical constructions of interpretation and understanding of cultural texts of Chinese civilization. Using a hermeneutic approach to studying artifacts of Chinese culture involves actively going beyond the literal meanings of traditional Chinese texts.

The hermeneutic approach to the study of Chinese culture provides an opportunity to become familiar with the features of the textual representation of cultural artifacts of Chinese civilization, to develop ideas about the dominant hermeneutic traditions in Chinese historiography, and also forms a system of knowledge about the main hermeneutic directions of research into modern Chinese culture.

For many contemporary researchers, the subject area of scientific interest is the hermeneutic traditions of Confucianism, the role of hermeneutics in Taoist and Buddhist interpretation of texts, in Chinese poetry and painting, as well as in modern Chinese culture.

The cultural dominant of Chinese civilization is the "Great Learning"Great Learning, one of the texts of ConfucianismThe Four Books, which has become the object of hermeneutic analysis by such researchers as John Berthrong [1],

Daniel Gardner [2, p.17-20], W. Watson(WalterWatson) [5], D. Dilworth(David Dilworth) [3] and others.

According to J. Berthrong, the content of the "Great Teaching" is a model for determining the nature of man, the social construction of the "I" and the model of a worthy person. The researcher points out that the "Comments" of Zhu Xi (Chu Hsi) to the "Great Teaching" can be considered as a fundamental model of human feelings, value hierarchies and exemplary actions of subjects. In addition, the reconstruction of the classical Confucian text contributes to personal improvement and the incorporation of the Confucian person into the processes of the universe. The "Commentaries" on the "Great Teaching" are a fundamental model of human moral qualities, value hierarchies and exemplary actions of subjects.

The problem of contradictory interpretations of the text "The Great Learning" is studied by Chung-ying Cheng, who focuses his scientific interest on the hermeneutic analysis of the content of this work, points out the allocation three levels of meaning in the interpretation of the text in the criticism of the neo-Confucian philosopher Wang Yang-ming [2, p.25].

The system of principles and strategies of the process of canonization of the text of Chinese culture is highlighted in the scientific works of Kai-Wing Chow (Kai-wing Chow) [2, p.50], John B. Henderson [4] and others. Researchers argue that the meaning of the text is embodied at four levels (material, linguistic, literary, ideological) and is based on a certain set of values and claims to truth, and the embedded ideology determines the relative authority and status of a particular work. The identified linguistic and textual strategies are, in the authors' opinion, the basis for the canonization of the text.

The allegorical method of interpreting the "Spring and Autumn Annals", "Book of Songs" is used in her scientific research by J. Ching (Julia Ching). The researcher claims that only by remembering the oral origin of classical texts can one begin to discover the meaning of the written signs left behind. According to J. Ching, a distinctive feature of Chinese writing, which consists of ideograms, is that the signs themselves, like sounds, usually represent ideas, and the recording of sacred texts on paper was thus intended to gain power, since with the help of the written word a person can do whatever they want [2, p.135].

The subject area of Ping-hui Liao's hermeneutic analysis is lyrical inscriptions in Chinese painting, the features of the textual practice of poet-artists in landscape paintings depicting symbolic objects such as orchids, bamboo or plums [2, p.279].

A modern interpretation of the Chinese literary tradition and the reconstruction of the history of Chinese literature as a "free-flowing river" is present in the research of Xudong Zhang [2, p.430].

Thus, the hermeneutic direction of the study of Chinese culture allows us to identify the historical specificity of textual interpretations of Chinese culture, fea-

tures of canonization and representation of texts of Chinese culture, as well as methodological the basis for interpreting Chinese cultural texts. This allows us to identify hidden meanings embedded in cultural texts and practices, analyze their impact on society, and promotes the expansion of knowledge of the fundamental principles of Chinese culture within the framework of interaction and mutual enrichment of cultures.

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“可食用”宪法：以食物形式呈现的国家宪法漫画
«EDIBLE» CONSTITUTION: THE IMAGE OF THE NATIONAL CONSTITUTION IN THE FORM OF FOOD IN CARTOONS

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摘要。本文探讨了以食物形式呈现的宪法漫画中相对罕见的形象。国家宪法通常被以实用主义的形式描绘成食物，以展现宪法的制定过程，或在描绘宪法吸收的漫画中对其进行破坏。同时，宪法也可以作为主菜、第二道菜或甜点。西德漫画中，国家宪法的“肖像”形象是一个例外，它由两种不同的、组合方式较弱的产物组合而成。虽然食物原则上可以像宪法一样作为精神食粮出现在艺术作品中，但目前漫画中尚未体现这一点，不像其他具有神圣语境（书籍、卷轴、碑文）的宪法图像那样。最后，作者阐述了漫画中图像潜力未能得到充分利用的原因。

关键词：宪法、宪法形象、食物协会、食物、可食用的宪法“肖像”。

Summary. *The article considers the relatively rare image of the constitution in caricatures in the form of food. The national constitution is caricatured, usually in utilitarian form, as food to illustrate the process of preparing a constitution or to damage it in cartoons about its absorption. At the same time, the constitution can act as a first, second course or dessert. An exception is the “portrait” image of the national constitution in the form of a combination of two different and weakly combined products in a West German caricature. Although food, like the constitution, in principle, can appear in works of art as spiritual food, this aspect has not been reflected in cartoons at the moment, unlike other images of the constitution with a sacred context (book, scroll, tablet). In conclusion, the author expresses his opinion on the reasons for such incomplete use of the potential of the image in cartoons.*

Keywords: *constitution, image of the constitution, food associations, food, an edible “portrait” of the constitution.*

Introduction

The images of the constitution are quite diverse [1, pp. 119-129]. In works of fine art, the most common and habitually associated with the constitution are such

images of it that repeat or resemble its original as much as possible, i.e. in the form of a scroll or book. However, along with them, other images of the constitution are widespread. They are especially diverse in cartoons, due to the specifics of this genre. “Caricature (Italian caricatura, from caricare - to load, exaggerate) is a genre of art, an image that creates a comic effect in order to ridicule and critically evaluate a person or social phenomenon. The cartoon uses means of satire and humor, cartoon, grotesque and artistic hyperbole; it combines the real and the fantastic, the characteristic features of the figure, face, costume, demeanor are exaggerated and sharpened, unexpected comparisons are used “[2, p. 155]. The famous cartoonist B. Efimov noted that “caricature has its own laws, its own metaphorical logic, its own system. It combines the incompatible in the most daring way, the real is intertwined with the fantastic... and, nevertheless, the structure and composition of the satirical drawing are subject to the strict calculation and intention of the author, all its external fiction, controlled by the artist’s firm hand, serves to express a concrete and clear thought “[3, p. 52]. The images of the constitution in cartoons are often paradoxical and unusual, including the images of the constitution in the form of food.

At first glance, the association of the constitution, i.e. legal act of the highest legal force, with food is unexpected. However, the choice of artists of this image is not accidental. It is built on association. If food nourishes the human body, then the constitution, being the foundation of the legal system, “saturates” it with the most important fundamental legal principles that give it integrity and vitality.

This artistic association can be used differently in a work of fine art in various situations, both in the creation of the constitution and in the implementation of its provisions. In this image of the constitution there is a significant potential, both positive, allowing to reveal both its importance and satirical, creating the opportunity to show various kinds of negative processes, which is fertile ground for the appearance of various kinds of cartoons.

At the same time, the appeal to the topic of nutrition and food in cartoons about the constitution is predetermined by its significance in human life. Food is one of the most important conditions for the preservation of the human race, along with water and air. In the hierarchy of needs developed by the famous American researcher A. Maslow, food is referred to basic needs, the satisfaction of which precedes the satisfaction of the rest. The study of the role of nutrition in the history of mankind led Massimo Montanari to recognize its enormous importance for the development of civilization, since its “many aspects... (economic, social, political, cultural) have always had a direct and primary connection with nutrition problems. It cannot be otherwise, since soon, daily maintenance of life is the first and most inevitable of human needs. But food is also a pleasure: between these two poles is our confusing story, to a great extent due to the relationship of power and

social inequality "[4, p. 7]. Both of these aspects (satisfaction of need and pleasure) are reflected in cartoons dedicated to the constitution, although sometimes in a rather peculiar form, since the characters in the cartoons enjoy not from the implementation of the constitution, but from its belittling.

In the visual arts, the image of food has been practiced since ancient times. Known frescoes of Ancient Egypt, Ancient Rome and Ancient Greece, depicting feasts. These images had different purposes: in ancient Egypt they were supposed to feed the dead in the afterlife, in ancient Greece and ancient Rome they showed wealth and abundance. In the Middle Ages, the purpose of the image of food changed: it is filled with religious meaning and values, enriched with symbolism. By the XVII century. the image of food stood out in an independent direction in the form of still lifes, which could be a symbol of a constant holiday of life, as well as a call for modesty and abstinence in food. The hidden meanings and symbolism of food are thus nothing new to fine art. The use of food as an image of the constitution, albeit paradoxically, continues a rather long tradition in art.

In addition, in language and literature, the gastronomic metaphor occupies an important place, this also affects the fine arts. The images of the giant gluttons Gargantua and Pantagruel from the satirical novel by François Rabelais, the witty humorous observations of Jerome Klapka Jerome about the role of gastronomy in the formation of resorts, and the works of many other authors create fertile ground for the emergence of new cartoons. The language is saturated with gastronomic metaphors that stimulate the imagination of artists, philosophers reflect on the topics of the metaphysics of food: what food does to a person, improves it or turns it into an animal [5]. At the same time, the transfer of comparisons with food to the political sphere is not uncommon. One of the well-known and striking examples is Charles de Gaulle's statement about the difficulties of managing a country with 265 varieties of cheese (a detailed analysis of the origin of this phrase based on sources: [6]. In this figurative comparison, the idea of the diversity of political preferences of the French is clearly expressed. Thus, from the point of view of the presence of a political component, cartoons with images of the constitution in the form of food fit not only into the artistic, but also the political tradition.

The purposes of using the image of the constitution in the form of food in caricature

What are the images of the constitution used for in the form of food in caricature?

The most suggestive image of the constitution in the form of food is associated with its preparation. The nutrition process includes the extraction/selection of ingredients for the preparation of the dish, its actual preparation and absorption of the cooked. All these components to one degree or another are reflected in cartoons, but the first two components are used to depict the features of the

constitutional process, it is he who is in the center of attention, the image of the constitution itself is in the background.

The image of the constitution in the form of an already prepared dish (as an artistic metaphor for the normative act that has come into force) is in the center of attention of cartoonists, usually as an object of eating. Unlike the purpose of nutrition as such, the saturation of the subject absorbing food is considered in this case not as a positive, but as a negative phenomenon, since it is a symbolic image of damage to the national constitution. When depicting the absorption of a dish, which is an image of the constitution, attention is focused on the nutrition process and the subject implementing it. At the same time, the dish itself, the image of which is used to depict the constitution, may not have any expressive features.

Sometimes the constitution as a cooked dish can be an image of the constitution, framed in the form of a kind of "portrait" (Fig. 4).

Food preparation, when ingredients are combined into a single dish, and cooks may doubt the recipe or even argue about which ingredients are better to put and in what quantity, is quite obviously associated with the preparation of a draft text of the national constitution, during which proposals are collected together and untimely or inappropriate ideas are eliminated. At the same time, depending on the nature of the dish, the composition and degree of activity of the participants, the picture of the constitutional process may change significantly.

Another option is to absorb the cooked, which can be seen as a positive (enjoyment of food) and negative process (destruction of the dish) in relation to the constitution. The role and behavior of the participants is also decisive here.

Image of the constitution in the form of first and second courses, as well as dessert

Since the center of this study is the image of the constitution in the form of food, it is advisable to first consider in the form of what dishes the cartoonists depict the constitution. In general, cartoonists follow the generally accepted ideas about nutrition, and the constitution adopts the image of the first course, the second course, and dessert.

As an example, when the constitution takes on the image of the first dish, one can cite the work of a cartoonist from Nepal, used as an illustration for the article by Jh. Jivesh «Whither implementation?» [7).] (Fig. 1).

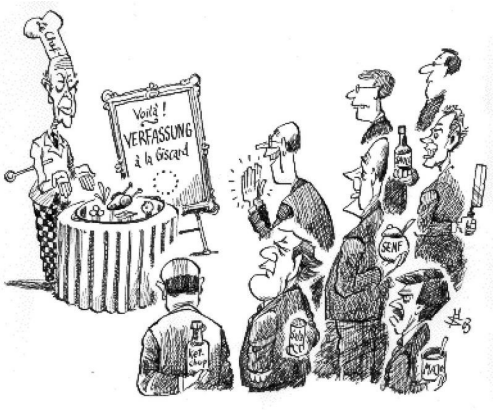
Figure 1. *Nepal Constitution Cartoon 2015. Illustration for the article: [7]).*

The cartoon clearly depicts the process of creating the 2015 Constitution of Nepal as carried out alone, by one character, in a chef's uniform and cap, but at the same time in dark glasses and characteristic slightly exaggerated pointed boots. The "chef" creates a dish to his liking, while apparently greatly diluting with "water," since he does not report the components on the caricature, but only adds liquid from the barrel, which can also be a culinary metaphor used by the cartoonist. The cook has an assistant, also in a cook's uniform, i.e. the person involved in the depicted constitutional process is depicted, but his task is, judging by the large ladle in his hand, to distribute the finished dish. The creation of the "new Constitution," as it is indicated on the cauldron standing on a large fire, takes place in a public space: the crowd is depicted in the background. It apparently personifies the people on whose behalf the 2015 Constitution of Nepal was proclaimed in the preamble ("We, the Sovereign People of Nepal... [8]). However, he does not participate in the creation of the Constitution, but stands aside from the process of creating the country's constitution in anticipation of a "constitutional stew" with scabs in his hands. The assessment of the Constitution in the caricature is much more pessimistic than in the article on the problems of implementing the 2015 Constitution of Nepal, which was used to illustrate. The article emphasizes the gap between the high ideals expressed in the preamble of this Constitution, in the form of the desire to "guarantee justice, freedom of thought and expression, equality, an equal society, periodic elections, complete freedom of the press, the rule of law, the republican system of government or the principle of proportional representation" and "not a rosy picture of reality" [7].

In this caricature, the constitutional process is critically assessed both in terms of the composition of the participants (alone, and not with the participation of the population), and the content of the Constitution being created (a lot of "water," "blur" of provisions). However, even with the collective process of creating the Constitution, cartoons appear that critically assess the constitutional process if it is too "organized" and carried out under the strict control of professionals. So, for example, happened with the preparation of the new Constitution of the Swiss canton of Freiburg in caricature. "Verfassungsreform auf guten Wegen" ("Constitutional Reform on the Right Track"), created by a cartoonist acting under the pseudonym Karma. In a caricature dedicated to this event, a group of cooks - clearly professionals in their field, states with satisfaction the ideal ratio of ingredients in the first dish they are preparing - a kind of stew or soup, clearly saturated, in their opinion, with everything necessary. This first dish is an image ideal from the point of view of constitutional professionals (it is written on the cauldron that a constitutional project is being prepared in it). The author reflected his somewhat ironic attitude to the legally verified "letter" project [for more details on this caricature, see: [9, pp.18-19]. It should be noted that the draft Freiburg Constitution is indeed the result of professional activity. Proposals for the project were worked out by eight specialized committees of the Constitutional Council, and the draft included 391 proposals [10.]. However, in the end, the draft was submitted to a referendum, at which it was adopted on May 16, 2004, since 58, 03% of those who participated in the vote [10] voted for it, i.e. it was approved by the population. In this regard, the Freiburg Constitution as a "product" differs significantly from the one depicted in the previous caricature with the external similarity of the depicted.

The above as an example caricatures are devoted to showing the features of the constitutional process in allegorical form in the form of the preparation of the first course. As for the absorption of this dish, the author has not yet met cartoons on this topic. In relation to the images of the constitution as a second course and dessert, on the contrary, there is often both a process of "preparation" and "absorption." These situations with the image of the constitution in the form of food were actively used by cartoonists during the preparation of the draft Constitution of a United Europe, for example, the German cartoonist Heiko Sakurai, who was repeatedly awarded the German Rückblende Prize for political photography and caricature. In his cartoon "Herzlichen Dank, Maitre, den Rest erledigen WIR!" (Ill. 2) show potentially two possibilities for action with the constitution as a second course: both its absorption and change. The cartoon illustrates the interpretation of the situation of the presentation on June 20, 2003 by Valerie Giscard d'Estaing to the heads of state or government of fifteen countries in the European Council in Thessaloniki of the draft Convention on the Future of Europe. These negotiations are presented in caricature as complex. "Chef" offers a ready-made,

in his opinion, dish, inviting participants to the tasting table. However, judging by the signature under the cartoon "Next we ourselves" the participants do not share the enthusiasm of the chef and are going to make significant changes to it. This is indicated by various (far from combining) spices that the participants keep behind their backs (i.e. secretly from the "chef"), intending to change the taste of the dish, and a knife that one of the participants holds clearly in order to grab a piece from the project (and not at all to dine, since he does not have a fork). This participant may have considered the product (draft Constitution) ready, but intends to significantly cut its content. The draft of this act is depicted as a second course, while the artist hints that the process of creating a normative act is far from complete and can be greatly delayed.



"Herzlichen Dank, Maître, den Rest erledigen WIR!"

Figure 2. *Author of the cartoon Sakurai H. Herzlichen Dank, Maitre, den Rest erledigen WIR! URL: https://www.cvce.eu/en/collections/unit-content/-/unit/02bb76df-d066-4c08-a58a-d4686a3e68ff/05c48216-3682-43be-ad30-bf13e07bfbd8/Resources#909741ea-04df-4e7a-b745-30a28adef328_en&overlay (accessed 10.08.2025)*

In addition to the first and second courses, confectionery, such as cookies or cake, can be chosen as the image of the constitution. This is a dessert, sweet, not the main food, but something additional and optional, but ending the meal, which reflects the corresponding interpretation and the depicted constitution. So, on a caricature about the creation of a draft Constitution of a united Europe with the name "Brussels New Year's Bakery" (author H. Sakurai), a group of confectioners violently and emotionally kneads dough in a basin. Again, as at the dawn of

constitutionalism, serious passions boil: cooks who personify different countries (which ones are written in the form of generally accepted abbreviations on their hats), violently, trying to push each other aside, prepare the draft EU Constitution in the form of "Christmas cookies" (this is evidenced by the inscription on the cauldron "Draft EU Constitution" and the lonely cookie already cut out of the dough, lying on baking sheet). As a result of this vigorous activity, it is insignificant and clearly does not correspond to the plans, although the "chef" already invites you to put the dish in the oven (for more details see: [9, pp. 20-21]. The artist wanted to say that with the serious passions of the participants with the only cookie prepared for baking, the fate of the project will not be easy, which turned out to be a kind of prophecy, although not quite for the same reasons that the caricature hints at. The draft EU Constitution, as you know, was created, but was not approved by the population.\

Absorption "of the constitution in the form of a dessert is depicted in a caricature dedicated to the situation with the Constitution of El Salvador and published in 2023 by the online edition" La prensa grafica "(Fig. 3).

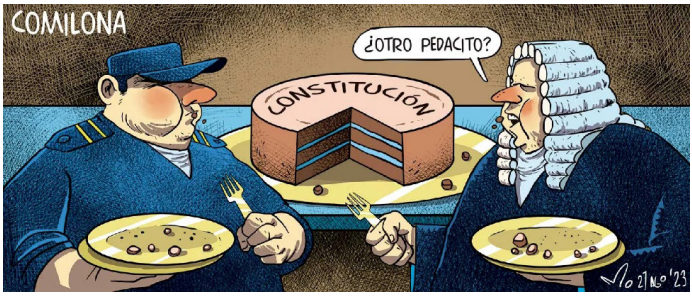


Figure 3. *Cartoon «¿Otro pegacito?.» La prensa grafica. URL: https://www.laprensagrafica.com/__export/1692597600125/sites/prensagrafica/img/2023/08/20/caricatura21082023.jpg (accessed 10.08.2025).*

Two characters (one in the uniform of a policeman, the other in the vestments of a judge and a wig) have already eaten a weighty piece of cake with the inscription Constitution with obvious pleasure. The question of the judge, asking the policeman if he wants "another piece," reveals their further intentions and the situation as a whole, as negative for this normative act.

A similar caricature is available in Colombia (the author is a cartoonist acting under the pseudonym Leo), but it is solely the Constitutional Court of the country that acts as a character absorbing the cake of the Constitution, and the cake itself is given the shape of a book, which is a direct metaphor and reference to the image of the constitution-book. In this symbiotic image of the national constitution,

combining the image of a book and a cake [11, pp. 104-105], the book, however, does not act as a carrier of sacred knowledge, but in the form of a dish, which diminishes its significance and emphasizes its vulnerability and harm to it.

A portrait approach to depicting the Constitution as food

In the above cartoons, the constitution is subject to the actions of constitutional legislators, law enforcers, or the judiciary. At the same time, in cartoons, although quite rare, there is a "portrait" approach to depicting the constitution, when it acts as the main character in different images. In relation to food, the image of a portrait-type constitution can have a very paradoxical look, as in a caricature placed on the cover of a monograph by Klaus Emmerich with the "talking" title "Gesamtdeutsche Verfassung - eine Karikatur: Ein Abriss mit Dokumenten?" ("All-German Constitution - caricature: with documents?") [12]. The constitution on this cartoon is such a combination of a meat dish and fruit: half sausages and half banana (Fig. 4), which is not usually combined in food. In the compound itself, thus, there is a doubt about the possibility of the existence of such a dish. The question in the title of the book also clearly shows the author's attitude to this act.

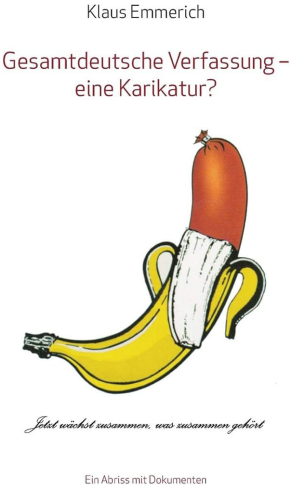


Figure 4. *Caricature on the cover of K. Emmerich [12].*

The work of K. Emmerich (Klaus Emmerich) is devoted to a turning point in the history of Germany, which led to the disappearance on the map of the state called the GDR and its entry into the FRG. It returns readers to the discussion about the development of a new Constitution of the Federal Republic of Germany, which was postponed due to the extension of the Basic Law of the Federal Republic of Germany to the territory of the former GDR.

Conclusion

The image of the constitution in the form of food reflects on the one hand the change of dishes in the kitchen in the form of the first, second and third dishes (dessert). At the same time, although food is necessary, its use in cartoons, when the constitution appears in the image of food, does not always occur in the interests of the population.

These images of the constitution in the form of food are used both to visualize the process of creating the constitution, its features and obstacles arising in the constitutional process, and to show the difficulties of implementing the constitution. Although food in principle can appear in works of fine art, including cartoons, as spiritual food (in the form of a book, scroll or tablet), this aspect has not been reflected in cartoons at the moment, unlike other images of the constitution with a sacred context. Even in images of a symbiotic nature (the constitution in the form of a book and at the same time a cake), it is not its spiritual origin and significance that is emphasized, but the process of its belittling. This incomplete use of the potential of the image of the constitution in the form of food in cartoons seems to be due to the fact that at present cartoonists see their task primarily in protecting the constitution, condemning the negative processes occurring with it, which is consistent with the nature of caricature as a genre.

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