



SCIENTIFIC RESEARCH OF THE SCO COUNTRIES: SYNERGY AND INTEGRATION

上合组织国家的科学研究：协同和一体化

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这些会议文结合了会议的材料 – 研究论文和科学工作者的论文报告。它考察了职业化人格的技术和社会学问题。一些文章涉及人格职业化研究问题的理论和方法论方法和原则。

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CONTENTS

ECONOMIC SCIENCES

仲裁法院体系发展和仲裁市场形成的制度变迁

Institutional transformations in the development of the arbitration court system and the formation of arbitration marketing

Voziyanova Natalia Yurievna, Mizhiritsky Konstantin Sergeyevich9

在数字化经济中聚焦客户注意力

Focusing customer attention in the digitized economy

Kameneva Nataliia Vladimirovna, Voziyanova Nataliya Yurievna.....17

零售药店发展中存在的问题对连锁药店工作质量的影响

Problems of retail pharmacy development affecting the quality of work of pharmacy chains

Shalenkova Ekaterina Vladimirovna22

利用可持续发展的通货膨胀模型进行短期收入预测的有效方法

An effective method for short-term forecasting of revenue using the inflation model of sustainable growth

Belykh Vasily Viktorovich.....29

特许经营的演变：从严格的标准化到混合管理模式

The evolution of franchising: from strict standardization to hybrid management models

Suyazov Vladimir Nikolaevich36

俄罗斯联邦经济安全状况评估

Assessment of the state of economic security of the Russian Federation

Torzhenova Tatyana Vladimirovna, Mamonov Roman Alexandrovich42

对外经济活动经理的专业能力

Professional competencies of the manager foreign economic activity

Zalavskaya Alexandra Vadimovna, Beganskaya Irina Yurievna.....47

JURIDICAL SCIENCES

国际仲裁程序的作用和不利裁决的性质

The role of international arbitration proceedings and the property of prejudicial decisions

Razumovskaya Vladislava Viktorovna53

土库曼斯坦的永久中立：国际法基本原则

Permanent neutrality of Turkmenistan: fundamentals of international law

Charyyev Toyly Saparvelievich.....58

POLITICAL SCIENCES

俄罗斯社会经济发展面临的挑战和趋势以及商业机构在其中发挥的作用

Challenges and trends in Russia's socio-economic development and the role of business institutions in it

Airapetian Iurii Rachikovich.....63

PEDAGOGICAL SCIENCES

跨学科方法对新手语言学家教师专业能力掌握水平进行自我诊断的发展

Interdisciplinary approaches to the development of self-diagnosis of the level of mastery of professional competence of a novice philologist teacher

Skafa Elena Ivanovna, Kudreyko Irina Alexandrovna70

克里米亚革命前的教育。费奥多西亚师范学院开办

Pre-revolutionary education in the Crimea. The teachers' institute opening in Feodosiya

Sharlat Lidiya Petrovna.....76

智能教育时代的教育学变革：人工智能技术的机遇与挑战

The transformation of pedagogy in the era of intelligent education: opportunities and challenges of artificial intelligence technology

Wan Yu Yang.....83

在俄语课上利用VR技术向外国学生介绍俄罗斯艺术。关于元宇宙作为教育资源的展望

Introducing Russian art to foreign students during Russian Language classes using VR technologies. Perspectives on the Metaverse as educational resource

Kuzubova Sofiia Yuryevna88

俄罗斯联邦和中国高校未来音乐教师历史和教育能力形成的比较分析

Comparative analysis of the formation of the historical and pedagogical competence of future music teachers in universities of the Russian Federation and China

Li Yiting.....95

启发式教学法在大学英语教学中的应用

The use of heuristic approach in teaching English to ESL university students

Malysheva Sofia Andreevna.....100

PHILOLOGICAL SCIENCES

互联网新媒体时代新闻事业的创新发展

Innovative development of journalism in the era of the internet and new media

Rong Tian Qi.....105

书写中表示英语双元音、单元音和双元音的字母及其组合

Letters and their combinations representing English diphthongs, monophthongs and diphthongs in writing

Rukhmanova Darya Dmitriyevna, Shilikov Sergey Ivanovich109

PHILOSOPHICAL SCIENCES

宗教的内化与外化

Interiorization and exteriorization in religion

Biryulina Tatiana Vladimirovna..... 117

SOCIOLOGICAL SCIENCES

预防人口脆弱性的新形式——俄罗斯紧急事务部工作人员与城市农业潜在参与者的互动

A new form of preventing population vulnerability - interaction of Russian Ministry of Emercom staff with potential participants in city farming

Talalaeva Galina Vladlenovna, Dobrynina Natalia Yuryevna..... 123

HISTORICAL SCIENCES

塔吉克斯坦与中国在上海合作组织框架下开展科学和教育领域的合作

Tajik-Chinese cooperation in science and education spheres within the framework of the Shanghai Cooperation Organization

Gaffori Numonjon Usmonzoda, Khamidzoda Furkat Mukim,

Khamidova Manzura Makhmudovna..... 129

ART HISTORY

优化职业教育课程体系

Optimizing the curriculum system in vocational art education

Lyu Si Chen, Lu Wei..... 135

CULTURAL STUDIES

纹样密码——广东省少数民族文化的传承与创新之路

Pattern ciphers: the path of heritage and innovation for ethnic minority cultures in Guangdong province

Liang Zhengmin 138

全球化时代中国文化代码的转型

The transformation of Chinese cultural codes in the era of globalization

Ling Tong 145

PSYCHOLOGICAL SCIENCES

教师个人和专业发展带来的专业相关性

Professional relevance as a result of personal and professional development of a teacher

Selyuch Marina Grigorievna 158

BIOLOGICAL SCIENCES

不同主导感知方式学生阅读时的眼动反应

Oculomotor reactions in students with different dominant perceptive modalities when reading

Zvyagina Natalya Vasilievna, Taleeva Anna Ilyinichna,

Skulyabina Daria Andreevna 163

海萨尔山谷（塔吉克斯坦）的珍稀鸟类标本 Rare birds specimen in the Hyssar valley (Tajikistan) <i>Muratov Rustam Sharifovich</i>	170
食品生产中的致病菌：微生物毒素与食品毒性感染的特点 Pathogenic bacteria in food production: characteristics of microbial toxins and food toxico-infections <i>Frolova Darya Dmitrievna, Kolberg Natalia Alexandrovna</i>	177

MEDICAL SCIENCES

听力障碍儿童牙齿异常的发生率和类型 Frequency and types of dental anomalies in children with hearing impairment <i>Chuihin Sergey Vasilyevich, Akatieva Galina Grigorievna, Speranskaia Natalia Sergeevna</i>	181
医疗服务市场中的牙科护理概念模型 Conceptual models of dental care in the medical services market <i>Karimova Daniia Yusufvna, Utkin Alexandr Vladimirovich</i>	186
与围产期中枢神经系统受累相关的功能性胃肠病 Functional gastrointestinal disorders, associated with perinatal central nervous system involvement <i>Bryksina Evgeniya Yurievna, Letifov Gadzhi Mutalibovich, Davydova Nadezhda Anatolyevna, Eliseeva Nina Dmitrievna</i>	190
体外猪肺模型中肺气漏的评估：单独使用密封剂或与胶原蛋白贴片联合使用的比较研究 Evaluation of pulmonary air leakage in an ex vivo porcine lung model: comparative study of sealants alone or combined with collagen patches <i>Ma Qingyun, Berikkhanov Zelimkhan Gezy-Makhmaevich, Ivanova Milena Yuryevna, Tarabrin Evgeniy Aleksandrovich</i>	196

TECHNICAL SCIENCES

通过选择自适应天线阵列单元幅度的最优分布来提高射电源测向精度 Improving the accuracy of the direction finding of the radio source by selecting the optimal distribution of amplitudes on the elements of the adaptive antenna array <i>Baimov Roman Irekovich, Telezhkin Vladimir Fedorovich</i>	204
北海航线对俄中贸易的影响 The impact of the Northern sea route on Russian-Chinese trade <i>Lebedeva Natalia Sergeevna, Popov Anatoliy Nikolaevich</i>	210

AGRICULTURAL SCIENCES

噬菌体是食品生产中控制致病菌的有前景的工具 Bacteriophages as a promising tool for sanitary control of pathogenic bacteria in food production <i>Frolova Darya Dmitrievna, Kolberg Natalia Alexandrovna</i>	216
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仲裁法院体系发展和仲裁市场形成的制度变迁
**INSTITUTIONAL TRANSFORMATIONS IN THE DEVELOPMENT
OF THE ARBITRATION COURT SYSTEM AND THE FORMATION
OF ARBITRATION MARKETING**

Voziyanova Natalia Yurievna

Doctor of Economics, Professor

Mizhiritsky Konstantin Sergeyeich

Postgraduate student

*Donetsk National University of Economics and Trade named after
Mikhail Tugan-Baranovsky*

摘要. 本文探讨了仲裁制度化及其体系的形成过程，分析了仲裁的结构和客体主体构成；以及俄罗斯仲裁法院作为解决经济纠纷和维护商业领域法律秩序的机构所发挥的作用。本文指出了俄罗斯国内仲裁制度发展的四个制度化阶段。并给出了作者对仲裁市场化的定义。

关键词： 仲裁市场化、经济纠纷、仲裁律师、仲裁法院体系、分阶段发展、制度转型、法律风险与权利保护、沟通。

Abstract. *The article examines the processes of institutionalization of arbitration and the formation of its system, analyzes its structure and object-subject composition; the role of arbitration courts in Russia as an institution for resolving economic disputes and ensuring law and order in the business sphere. Four stages of institutionalization of the development of the domestic arbitration system are identified. The author's definition of arbitration marketing is given.*

Keywords: *arbitration marketing, economic dispute, arbitration lawyer, arbitration court system, periodization, institutional transformations, legal risks and protection of rights, communications.*

The President of the Russian Federation V.V. Putin noted that "...now the entire global system of economic relations is undergoing a stage of fundamental and irreversible changes. They are associated with the fact that the former model of globalization is being replaced by a multipolar model" [1]. The desire to achieve truth and justice is a normal phenomenon for a person in all historical times of human civilization. In conditions when there is no mutual understanding between the parties to a dispute/conflict - since ancient times they turned to elders, sages,

etc. for help. In the history of mankind nothing changes in essence. Changes occur in technologies, methods, value system, etc. [2, c. 394-397]. Building a sovereign, just state where there is a consensus in the conventional understanding of justice is a difficult task. A state that uses the institution of the rule of law and courts (different in different cases: criminal, arbitration, etc.) is a really strong state, and its brand should be formed, explained, supported. And the best way to maintain a brand, whether it's a company or a government, is to build close communications and use modern trends [3, pp. 223-325], technologies and technological innovations [4, pp. 602-604]. The strategic application of marketing principles enables the creation of a comprehensive ecosystem that effectively balances and fulfills the diverse needs of all involved parties. For the state, this translates into maintaining legal order, securing consistent tax revenues, and fostering sustainable development. The integrated court and business structures benefit through streamlined processes that reduce operational burdens while ensuring high-quality decision-making, supported by properly executed procedures - some of which may be handled through outsourcing. Meanwhile, businesses and individual participants in arbitration proceedings gain assurance through fair rulings, which reinforces their trust in state institutions and ultimately contributes to maintaining broader societal stability.

In this regard, important aspects of understanding and meanings are: faith, trust, truth, justice, brand of the state and judicial system, including arbitration, etc. Arbitration, arbitration courts act as an entity ensuring the rule of justice on behalf of the state, supporting the brand of the state.

Characteristic features of the modern interaction environment include: instability; uncertainty; widespread use of the Internet and Internet technologies; high speed of information dissemination, its accumulation and use of databases for various purposes; expansion of digitalization, which is good and bad at the same time (various risks are growing, and therefore transaction costs); use and development of technologies for influencing people's consciousness, etc.

Thus, the institutions that ensured interaction are destroyed; in an era where legal norms remain imperfectly enforced, armed conflicts persist, and emerging economic paradigms struggle to take shape, the deliberate adoption of digital technologies - exemplified by Russia's e-justice system launched in 2017 - assumes critical importance. This digital transformation transcends mere technical modernization; it serves as a fundamental instrument for consolidating state institutions, safeguarding judicial integrity, and cementing the principles of lawful governance as essential drivers of national advancement. These technological advancements should function not as ends in themselves, but as a dynamic framework driving economic growth and societal evolution—propelling Russia forward as a distinct civilization-state. For this purpose it is necessary to understand where the market

works and where the state plan with the sphere of circulation and what is the model of interaction between them, including possible hybrid forms of such interaction (possibly created for a certain period). In this regard, marketing is necessary not only for business, but also for the development of the state, building communications of interaction participants at different levels, including interactions between countries, which requires marketing research and strategy [5, p. 316-320]. In this regard, the goals and clearly formulated objectives are important, under which the techniques and technologies for their realization are developed, which should take into account the systemic institutional and marketing nature of such new relationships and models, taking into account the improvement of the quality of life of the population. Consequently, it is necessary to build a new marketing system for the development of the arbitration system in modern conditions of instability of external and internal environment, characterized by the destruction of the old economic model based on the theoretical foundations of economics as the mainstream of economic thought.

Justice, its defense (proof of rights, right, etc.), establishment of the fact of “rightness” is associated with the emergence of costs (time, energy, finance, etc.), i.e. is not without costs and is associated with transaction costs. With the development of digitalization, virtualization of markets on a global scale such costs will only increase, which determines the need for marketing, including arbitrage marketing. Marketing allows us to understand what a service should be, how much it can cost in moral, physical, financial and time equivalent.

Arbitration marketing - the concept of providing arbitration and related services related to the satisfaction of human and social needs in the legal resolution of disputes.

The study of historiography of institutionalization of the development of arbitration and the system of arbitration courts has shown the existence of several periods.

The first period - Ancient, Medieval and Tsarist Russia. It is XII - XIX centuries, associated with the emergence of trade courts. In ancient Russia trade relations were regulated mainly by customs and traditions. Disputes between merchants were resolved on the basis of the principles of justice and fairness, as well as taking into account the established trade customs. With the development of trade and the complication of economic relations, there was a need for a more formalized approach to the resolution of commercial disputes. With the formation of the centralized state and the strengthening of the prince's power, the first elements of the judicial system began to take shape, including for the resolution of trade conflicts. In the fifteenth and sixteenth centuries, special judicial institutions emerged to hear cases related to trade and business activities. These early forms of trade courts laid the foundation for the further development of arbitra-

tion proceedings. An important step was the adoption of the Trial Courts of 1497 and 1550, which contained norms regulating trade relations and dispute resolution procedures. However, the system was still far from perfect and required further development.

The second period - the Russian Empire. In the first half of the 19th century, the Russian Empire experienced significant changes in the economic and legal spheres. One of the important aspects of these changes was the development of the system of commercial courts, which played a key role in regulating trade relations and resolving commercial disputes. Commercial courts were established to ensure the efficient and specialized handling of cases related to trade and business activities. They became an integral part of the judicial system of the Russian Empire, designed to promote economic development and protect the rights of entrepreneurs. In the first half of the 19th century, commercial courts operated in major trade centers such as St. Petersburg and Moscow. They were organized on the basis of principles enshrined in legislation and had a clear structure. The courts were composed of professional judges with knowledge and experience in commercial law. This ensured a high level of qualification and competence in the consideration of commercial cases. In addition, the courts could include representatives of merchants, which contributed to taking into account the specifics of commercial activity and interests of entrepreneurs [6]. It should be noted that the decisions of commercial courts were binding and could be appealed in higher instances. This provided protection of the rights of participants of trade relations and contributed to the strengthening of law and order in the field of trade [7].

The third period is the Soviet period. The history of arbitration courts in Russia dates back to the early 20th century. The first arbitration courts were established during the NEP (New Economic Policy) in the 1920s to resolve economic disputes between state-owned enterprises and private economic entities. However, after the end of the NEP and the transition to a planned economy, arbitration courts lost their importance and were abolished. The revival of arbitration courts is associated with the period of perestroika and economic reforms in the USSR in the late 1980s. In 1988, a law was adopted to restore the system of state arbitration to resolve economic disputes between enterprises and organizations [8].

The fourth period marks the post-Soviet era and the rise of modern Russia. Following the dissolution of the USSR and the establishment of the Russian Federation, arbitration courts experienced a renaissance. A pivotal moment came on July 24, 1992, with the adoption of the Federal Constitutional Law "On Arbitration Courts in the Russian Federation" [9]. This legislation not only integrated arbitration courts into the judicial system but also outlined their structure and functions, laying the groundwork for a robust framework that now plays a vital role in upholding economic justice. Today, Russia's arbitration courts operate on a

multi-tiered principle, ensuring efficient resolution of commercial disputes across various jurisdictions and administrative levels. Historically, the Supreme Arbitration Court of the Russian Federation stood at the apex of this hierarchy. However, a significant reform in 2014 transferred its authority to the Judicial Collegium for Economic Disputes of the Supreme Court of the Russian Federation. This body now handles cassation appeals and shapes legal precedents in economic matters, ensuring uniformity in judicial practice. Beneath it, arbitration district courts (or cassation courts) review decisions from regional arbitration courts, adapting to administrative changes as needed. At the mid-level, arbitration appellate courts reassess rulings from first-instance courts, operating within designated territorial zones encompassing multiple federal subjects. The foundation of this system consists of arbitration courts within Russia's federal entities, including republics, provinces, *arealy*, federal cities, and autonomous districts. As the primary venues for initial dispute resolution, their presence mirrors the number of regions in the Russian Federation, ensuring accessibility and localized justice. This structured yet dynamic system underscores Russia's commitment to a fair and orderly economic legal framework.

As of March 1, 2025, there are 85 arbitration courts in Russia.

Arbitration and arbitration courts operate in the Russian Federation, and there are a number of significant differences between them. Arbitration courts are state judicial instances whose activities are regulated by the Arbitration Procedure Code of the Russian Federation and other federal laws. They are engaged in consideration of cases related to economic disputes and issues arising in the course of entrepreneurial and other economic activities [10].

Arbitration courts, by contrast, are established through mutual agreement between disputing parties and operate under the framework of the Federal Law 'On Arbitration Courts in the Russian Federation.' These judicial bodies possess broad jurisdiction, enabling them to adjudicate civil, commercial, labor, and other disputes—provided all involved parties have consented to arbitration [11]. A key distinction lies in their formation and structure: while traditional arbitration courts follow statutory guidelines in appointing judges, arbitration tribunals grant parties the autonomy to determine both the number of arbitrators and their selection [12]. Decisions rendered by arbitration courts carry mandatory legal force, with mechanisms in place to enforce rulings if voluntary compliance is refused. Similarly, arbitration awards are binding on the parties; however, their execution ultimately hinges on the continued mutual agreement of those involved. If one party refuses to comply with an arbitral award, the other party may apply to a state court for a writ of execution. In addition, the arbitration court system provides for appellate and cassation instances for appealing decisions. For arbitration courts, the possibility of appealing decisions is limited and is mainly aimed at verifying compliance with procedural rules [11].

Procedural peculiarities also differ: in arbitration courts procedural rules are strictly regulated by the Arbitration Procedural Code of the Russian Federation, while in arbitration courts the parties can agree on procedural rules, which gives more flexibility in procedural issues. In this regard, it is natural to deepen professionalization, the emergence of the need for arbitration lawyers, etc.

An arbitration lawyer is a legal specialist who represents clients in arbitration courts and is engaged in the defense of their rights and interests in economic disputes considered in the arbitration process.

Arbitration lawyers have in-depth knowledge of civil, commercial and corporate law, as well as specific areas of legislation governing business activities. They assist clients in preparing and filing statements of claim, complaints and other procedural documents, as well as represent their interests in court hearings. In the work of an arbitration lawyer can deal with various aspects: from advice on business and prevention of legal risks to direct participation in court proceedings. Lawyers analyze documents, collect evidence, develop a defense or prosecution strategy, negotiate with the opposing party and participate in mediation procedures to settle disputes out of court [13]. An important part of the work of an arbitration lawyer is the ability to navigate arbitration practice and precedents, which allows to build a more effective defense of the client's interests. Lawyers also follow changes in legislation and judicial practice, so that their clients could quickly adapt to new conditions and minimize legal risks.

In addition to work in court, an arbitration lawyer can provide services for the preparation of contracts, analysis of transactions, assessment of legal risks of projects and representation of the client's interests in arbitration and arbitration courts, as well as in state bodies [12]. Consequently, among the entities providing legal services should be distinguished: law firms and private practitioners who can unite in legal communities and use community marketing. In a world that is subject to globalization, digitalization, virtualization communication processes become an important tool in doing business, spreading and perpetuating views and meanings. In this regard, marketing communications as a process of giving information from the subject of marketing to the object - the target audience, acquires special relevance and importance.

Thus, the study of historiography of institutionalization of the development of the arbitration courts system and the formation of arbitration marketing allows us to state the dynamic nature of changes and the fact that modern systems are not in an equilibrium state. The use of marketing becomes an objective necessity both for the development of action strategies and for their practical realization in real life, where the rule of law, legality and justice should prevail.

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集中客户的关注在数字化经济中
**FOCUSING CUSTOMER ATTENTION IN THE DIGITIZED
ECONOMY**

Kameneva Nataliia Vladimirovna

PhD in Economics, Associate Professor

Voziyanova Nataliya Yurievna

Grand PhD in Economics, Professor

*Donetsk National University of Economics and Trade Named After
Mikhail Tugan-Baranovsky, Donetsk, Russia*

摘要. 本文探讨了在数字化环境下如何将顾客注意力集中到商业产品上。有效的销售漏斗管理需要深入了解顾客的注意力特征，以便制定相关的营销和销售策略。作者建议采用基于类型学的方法来分析顾客的注意力，以确定其潜在的情感体验，以解决信息过载以及品牌与消费者之间缺乏直接联系导致的注意力缺失问题。

关键词: 数字化经济、顾客注意力、注意力广度、购买行为、顾客行为、电子商务。

Abstract. *The paper deals with the problem of focusing customer attention on commercial offerings in a digitized environment. Effective sales funnel management requires in-depth understanding of the attention characteristics in order to inform the relevant marketing and sales strategies. Authors propose using a typology-based approach to the analysis of customer attention determining its underlying emotional experience to address the issues related to the attention deficit caused by information overload and the lack of direct contacts between brands and consumers.*

Keywords: *digitized economy, customer attention, attention span, buying behavior, customer behavior, e-commerce.*

Introduction. The digitization of the global economy entails profound changes in buying behaviors. Those changes are caused by general information overload as well as by the appearance and enlargement of numerous new communication channels followed by the decline of traditional ones. The globalized online experience and social media create new factors shaping customer preferences and consumer sentiment while previous assumptions regarding customer behavior

sometimes do not work. Consumer goods markets are now oversaturated by a variety of choices as one or two new brands are launched daily on an average [1]. As a result, the customer attention is getting increasingly dissipated, fragmented, and less likely to be focused on a given offering. This situation presents significant issues for market players because capturing and holding target audience attention is crucial for the success of a marketing strategy.

Focusing customer attention is an increasingly challenging task in the contemporary digitized world. Besides the above-mentioned “audience-side” problems, goods suppliers face serious issues in establishing contacts with potential customers and attracting their attention in the digital environment due to the impact of online marketplaces [2] and, since recently, neural networks and neural search algorithms. The dissipation of customer attention and differences of its manifestation in various communication channels complicate the prediction of funnel conversion rates. It is, therefore, necessary to have a closer look of the attention phenomenon to understand its potential effect on purchasing decisions.

Main discussion. Digitization and trade globalization processes led to the following major changes in the consumer market landscape and, consequently, to some important shifts in the customer behaviors.

First, the ever-increasing online information flow caused the so-called “information overload” effect when the volume of data received by a person may exceed his or her ability to absorb and analyze it [3]. Part of that problem, which directly concerns the purchasing decision-making processes, is the overwhelming abundance of choices offered to a consumer by good producers and service providers. At some point, an excessively broad range of options, instead of giving a person the feeling of freedom, makes the choice a painful experience leading to the “decision fatigue” [4]. As a result, focusing attention gets increasingly difficult. Researches performed by Microsoft and CNN have shown a drastic decrease in average attention span when watching on various devices and screens. According to Microsoft’s findings, the average attention span fell from 12 to 8.25 seconds between 2000 and 2015 while the average time, during which CNN managed to capture viewers’ attention, decreased from 150 seconds in 2004 to 47 in 2023 [5]. Information overload may be a driver behind the development of a neurological syndrome called Attention-Deficit Disorder (ADD), a form of Attention-Deficit/Hyperactivity Disorder (ADHD), which was earlier mostly diagnosed in children. Recently, however, the adult ADHD becomes an important health issue. While it is unknown whether it can be directly attributed to the information consumption, the latter, being a cause of applying for medical assistance, might contribute to the rise in diagnosis rates [6]. In 2023, over than 8.7M adult ADHD cases were registered in the U.S. showing an increase from 6.1% to 10.2% of the adult population over 20 years) [7]. Customers, overwhelmed by incoming information flow and

challenged by the decision fatigue, develop “advertisement resistance” and use self-protection strategies blocking the absorption of unsolicited marketing-related information.

Second, communication online competes with or sometimes even supplants live interpersonal communication including the ties between consumers and brands. Virtual communities with their own subcultures are forming in social media and begin to make a strong and sometimes unpredictable impact on the buying behaviors. Mass customer migration to e-commerce platforms further weakens the connection between brands and their audiences as most buyers never visit websites of goods producers [2]. Additionally, the widespread use of AI tools disrupts human interaction due to bot activity, which according to some studies, accounts for roughly half of overall Internet traffic [8].

The above factors create a growing deficit of customer attention and make the task of its capturing, focusing, and maintaining highly complicated. Addressing it requires close attention to the relevant issues and significant effort from marketers. In the authors’ opinion, a typology approach consisting in analysis of various attention types would be useful to understand attention. Basically, three types of attention may be present when dealing with a commercial offering, namely, negative, neutral, and positive attention. A deeper classification might prove to be helpful.

Negative feelings, urged either by personal or cultural or other societal issues, can be a strong driver of noticing or even searching information regarding certain products, brands, or technologies. In this respect, a typical case was the international wave of aversion toward 5G mobile communication technology and 5G-based products inspired by health concerns spread in social media in 2020/2021. The anti-5G campaign even incited public protests in some places (see e.g. [9]). Other examples of similar negative attention may be related to brand boycott campaigns on environmental, political, or religious grounds.

Neutral attention may be caused by a person’s exposure to some advertising material or other brand-related information encountered online. Attention focusing in such case would typically strongly depend on the emotional state of the relevant Internet user.

Positive attention may replace neutral or even in some cases negative one upon getting additional information. It looks, however, more likely that positive attention would be caused by finding information, which was deliberately looked for in connection with some personal interests or consumer needs.

It is, therefore, important for brand managers to discern the types of attention shown online and develop relevant conversion strategies. It implies the necessity to determine meaningful metrics allowing the evaluation of attention signals. Generally, it is not a trivial task: for instance, a like in social media in many cases

would be a sign of neutral rather than positive attention. Neuromarketing methods appear to be a powerful tool in this area. While, at the present technology level, it is unlikely to obtain neurophysiological data online, neuromarketing research may help to predict audiences' emotional responses (negative, neutral, or positive) to marketing stimuli and customer experiences [10].

Conclusion. Digitization processes drive the transformation of consumer trade making customer attention an extremely scarce and valuable finite resource. The effective use of this resource by capturing and converting it to sales requires understanding of the emotions underlying the attention shown to brand offerings. A typology-based approach to the customer attention research appears to be a useful tool for defining marketing strategies and building effective customer behavior models.

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零售药店发展中的问题影响连锁药店工作质量

PROBLEMS OF RETAIL PHARMACY DEVELOPMENT AFFECTING THE QUALITY OF WORK OF PHARMACY CHAINS

Shalenkova Ekaterina Vladimirovna

*Candidate of Pharmaceutical Sciences, Associate Professor
Privolzhsky Research Medical University*

摘要. 本文致力于分析在经济全球化和数字化背景下蓬勃发展的现代医药零售市场。尽管连锁药店的销售额和产品种类不断增加,但仍存在一些严重问题,威胁着该行业的经济增长质量和可持续发展。药店在医疗保健体系中发挥着重要作用,为民众提供必要的药物治疗以及药物选择和使用方面的咨询。然而,连锁药店的迅猛发展并没有带来服务质量的提升。市场集中度是关键问题之一,这导致了零售领域的垄断和质量竞争的减弱,从而对医药服务质量产生了负面影响。反过来,制造商和连锁药店之间的营销合同又削弱了患者个性化治疗的有效性。此外,还存在合格药师短缺的问题,因为新开的药店往往缺乏经过充分培训和缺乏必要教育的员工。数字化和全渠道技术的引入也改变了药剂师的角色,减少了他们在问诊过程中的参与度,从而降低了医疗质量。为了解决这些问题,本文提出了一个综合性的方法,包括改善公众对药剂师职业的认知、加强国家对连锁药店的监管以及创造公平的市场竞争条件。这些措施可以确保医药行业的长期发展,并改善民众的健康水平。

关键词: 连锁药店、药剂师、药房、全渠道技术、非主体经济、医药零售、连锁药店质量。

Abstract. The article is devoted to the analysis of the modern pharmaceutical retail market, which is experiencing intensive growth in the conditions of globalization and digitalization of the economy. Despite the increase in sales of pharmacy chains and the variety of products offered, there are significant problems that threaten the quality of economic growth and sustainable development of the sector. Pharmacies play an important role in the healthcare system, providing the population with essential pharmaceutical care and counseling on the choice and use of medicines. However, the significant growth of pharmacy chains has not been accompanied by qualitative improvements in services. One of the key problems is market concentration, which has led to monopolization of the retail segment and reduction of quality competition, which negatively affects the quality of pharmaceutical services. In turn, marketing contracts between manufacturers

and pharmacy chains worsen individualized approach to patients. There is a problem of lack of qualified pharmaceutical staff, as new pharmacy outlets are often opened with inadequately trained staff lacking the necessary education. Digitalization and the introduction of omnichannel technologies also transform the role of pharmacists, reducing their involvement in the consultation process, which worsens the quality of care. To address these problems, the article proposes a comprehensive approach, including improving public perception of the pharmacy profession, strengthening state control over pharmacy chains and creating conditions for fair competition in the market. These measures can ensure the long-term development of the pharmaceutical sector and improve the health of the population.

Keywords: *Pharmacy chains, pharmacists, pharmacy, omnichannel technologies, non-subjective economy, pharmaceutical retail, quality of pharmacy chains.*

The modern pharmaceutical retail market is characterized by intensive growth and rapid development, especially in the context of globalization and digitalization of the economy. At the same time, despite the obvious successes in increasing sales volumes and expanding the product range, there are serious challenges related to the quality of economic growth of pharmacy chains and sustainable development of the retail pharmacy sector as a whole. This article is devoted to analyzing the key challenges and finding ways to address them.

Pharmacy chains in any region are an integral part of the healthcare infrastructure, offering a wide range of medicines, pharmacy assortment goods and, especially, crucially important pharmaceutical services to the population. Pharmacy fulfills an important social function [2]. Pharmaceutical counseling is an important component of pharmaceutical services aimed at providing qualified assistance to patients in the proper selection, use and storage of medicines. It includes assessing the patient's condition, explaining the indications and contraindications of the treatment prescribed by the doctor, and informing about possible side effects and drug interactions with other substances. The pharmacist helps the patient to choose the most appropriate drug, taking into account the individual characteristics of the body, counseling contributes to improving the level of medical literacy of the population and prevents possible errors in self-medication. In recent decades, there has been a significant growth of pharmacy chains, especially in quantitative terms: pharmacy chains are now growing mainly due to the opening of new outlets. This is quantitative, economic growth that does not translate into qualitative growth. Economic growth of pharmacy chains is accompanied by a number of negative consequences.

Firstly, it is a strong market concentration. One of the negative consequences of retail market concentration is an increase in the share of large pharmacy chains in the region, which leads to monopolization of the retail segment of the pharmaceutical industry, reduces competition and limits the access of small players (small pharmacy chains and, especially, individual entrepreneurs) to the market. This leads to the so-called “monopoly of pharmacy chains”, when large players have all the trump cards: they can offer lower prices for medicines due to the fact that distributors provide them with marketing discounts related to sales volumes. The lack of competition has a negative impact on the quality of services provided, and why this happens is a separate discussion, related to the low quality of staff recruited to newly opened pharmacies. The population begins to perceive pharmaceutical workers as salespeople [1].

Also, no doubt, everyone has seen that in one house in the neighborhood there can be two or more pharmacies. The fact is that in the Russian Federation the distance between pharmacies is not regulated. As a result, this leads to a high concentration of pharmacies in big cities and regions with high solvency of the population, while in the provinces, less developed settlements, the number of pharmacies does not grow, as it is not profitable to open them there. As a result, the opening of new outlets does not lead to an increase in the availability of medicines for the population: the problem of drug supply in the settlements remote from the regional center remains unsolved.

Secondly, the standardization of pharmaceutical counselling associated with the obligation to execute marketing agreements impairs the possibility of individual selection of medicines for patients. Pharmacy chain marketing agreements are agreements between manufacturers of pharmaceuticals, medical devices or other products available in pharmacies and pharmacy chains. The primary purpose of such agreements is to market certain brands or product lines by increasing their visibility and availability to end consumers. Marketing agreements may include various forms of cooperation, such as: placement of promotional materials and equipment; holding promotional events and promotions in the sales area; prioritizing the display of drugs in the checkout area and on display cases; maintaining the assortment and ensuring defect-free availability; and fulfilling volume sales agreements. In our study, it was found that the main factor in pharmacists’ offering a drug in pharmacies is the fulfillment of the marketing agreement and recommendation of the most expensive drug. Thus, 60% of specialists first offer the drug that the pharmacy management has prioritized in accordance with the marketing agreement, and only 10% of pharmacists take into account the customer’s needs and his choice criteria. It turned out that 90% of pharmacists experience professional discomfort when fulfilling marketing agreements. The reason for the discomfort for 73% of them is the knowledge of the existence of a more effective and safer

drug for a particular buyer, as well as the consumer's dissatisfaction with the price of the proposed product. If there is no marketing agreement, the main criteria of drug selection for 58% of pharmacists become their personal experience of use, for 28% - recommendations of doctors, and only 14% rely on their professional knowledge [5]. Personal effectiveness is not objective, which also indicates the low quality of pharmaceutical services provided by pharmacy chains.

Third. Reduction of responsibility of pharmacy chains with regard to pharmaceutical workers. The increase in the volume of work in the pharmaceutical industry has led to a significant increase in the need for qualified specialists. Pharmaceutical manufacturers have also now stepped up their recruiting activities in an effort to attract as many pharmaceutical professionals as possible. However, this only exacerbated the already existing deficit of specialists. Fewer than two candidates apply for each vacancy in the pharmaceutical sector, which is significantly lower than the average for other industries. Vacancies for pharmacists occupy leading positions among all vacancies in the field of medicine and pharmacy. A rapid analysis of vacancies on popular online job search platforms revealed a curious phenomenon. When asking for "Provisor" or 'Pharmacist', vacancies with the hybrid title "Pharmacist-Provisor" are often offered. For example, on the main page of the HeadHunter website (www.hh.ru) when you search for "provisor" you can see such ads. It is necessary to understand what exactly the functions are implied by such a combined position. At first glance, it seems that we are talking about combining the functions of a pharmacist and a provisor. However, the boundaries of the competencies of these specialists are quite clearly defined by law. A pharmacist is a specialist with a university degree in pharmacy, who has broader powers than a pharmacist with college education in pharmacy: the employer incorrectly formulates the requirements for the vacancy using a hybrid title. A more in-depth study of the pharmaceutical labor market is needed to understand the true reasons for the spread of such "hybrid" vacancies and their impact on the quality of work of specialists and drug safety of patients. In any case, this trend requires attention from regulatory bodies and professional associations [7].

Fourthly, the quality of newly recruited staff in newly opened pharmacy outlets is decreasing. The constant expansion of chains requires new staff, and in the context of a shortage of pharmaceutical professionals, pharmacy chains recruit employees without pharmaceutical education ("salespeople", "cashiers"). Such employees cannot perform consulting and dispensing of medicines: only persons with pharmaceutical education and a certificate of accreditation of a specialist are allowed to perform pharmaceutical activities (Article 69 of Federal Law No. 323 "On Protection of Citizens' Health in the Russian Federation"). The presence in the pharmacy of specialists with pharmaceutical education is one of the license requirements for pharmaceutical activities. If the regulatory authorities detect the

fact of selling a medicinal product by an employee without pharmaceutical education, the pharmacy may be held liable for gross violation of license requirements. It is quite easy to conduct inspections without going to the pharmacy: look at the Federal Register of Medical and Pharmaceutical Employees, which includes data on working pharmaceutical specialists of the pharmacy network; but such inspections are not carried out. Approximately 30% of pharmacy professionals are now not authorized to provide pharmaceutical counseling [6].

Fifth, the digitalization of pharmaceutical retail and the development of omnichannel, leading to the development of subjectlessness in pharmaceutical counseling. The increase of non-subjectivity in the pharmaceutical sector, caused by the introduction of omnichannel technologies, leads to significant changes in the role of pharmacists, transforming them from professionals actively interacting with customers to operators mainly engaged in the process of order dispensing. Omnichannel technology is a unified system of interaction with the customer through different channels, such as messengers, social networks, website, call center. This approach creates a “seamless space” for the patient, when at any stage he can start communication through one channel and immediately continue in any other, without losing important information and without the need to re-enter data. Omnichannelization allows for “better service” as the business remembers what and when the patient asked, sales processes go faster, employee workload is reduced, and conversions increase. But in the face of this change, the pharmacist is increasingly becoming a “mechanical” performer who is primarily responsible for receiving and dispensing the order, reducing personal interaction with patients. Skills related to pharmaceutical counseling and patient interaction are becoming less in demand. Sooner or later, patients may be faced with a situation where their questions and needs are not adequately addressed because the pharmacist is no longer an active counselor, but only performs order processing functions. This change in the structure of pharmacy work poses a number of serious challenges for the industry: there is a risk of losing the value of human interaction in the process of receiving pharmaceutical care, which may negatively affect the quality of pharmaceutical services provided; traditional skills related to counseling and individual approach to the patient become less relevant and the question arises as to who will be the counselor and what will be the function of the pharmacy and pharmacist.

Pharmaceutical counseling is normatively enshrined as one of the main labor functions of a pharmacist and is aimed at assisting the patient in responsible self-medication; accordingly, in a non-subjective environment, counseling does not occur. If pharmacy chains stop counseling patients and focus solely on selling medicines, this could lead to many negative consequences for both the health of patients and the pharmaceutical care industry as a whole. Firstly, patients may

start taking drugs without proper information about indications, contraindications and possible side effects. This is especially true for those who buy medicines on their own, without prior consultation with a doctor. As a result, cases of improper use of medications may occur, which will increase health risks, possible adverse reactions and worsening of the general condition of patients. Secondly, lack of consultation may lead to increased hospitalizations due to complications associated with inappropriate treatment. Without competent advice from pharmacists, patients may not know which medicines interact with each other and this can lead to life-threatening situations.

It is important that pharmacy chains recognize the need to balance the technological benefits and the human aspect of omnichannel, providing their customers with both professional advice and high quality service at all levels. However, omnichannel technology as a full marketing tool is only available to large and “rich” pharmacy chains. Thus, the transition to omnichannel technologies requires careful evaluation and integration of the human factor into the processes to avoid depersonalization of services and to maintain a high level of professionalism in pharmaceutical activities [3,4].

In order to overcome the above problems and ensure sustainable development of pharmacy chains, a comprehensive solution is needed, including:

Firstly, changing the quality of the attitude of society and pharmacy chains towards pharmaceutical professionals - provisors and pharmacists. As already mentioned, there are a number of problems in the development of the pharmaceutical industry. One of them is the negative public perception of the role and importance of pharmacists as “simple sellers of medicines” which, unfortunately, is supported by pharmacy chains that are primarily profit-oriented and distributors that offer marketing contracts. To improve the situation, it is necessary to change the approach: to focus on the patient and the employee, moving from a purely economic model to an ethical one based on moral principles and care for people.

Secondly, the creation of sufficient state regulation of pharmacy chains in general. Unrestricted growth of pharmacy chains and lack of normal state control leads to uneven quality of pharmaceutical services and creates risks for patients. This requires the development and implementation of stricter and more uniform rules of operation for all pharmacy chains, including rationing the distance between neighboring pharmacy outlets. Overall, a comprehensive solution is needed to improve the situation, including both changing public perceptions of the pharmaceutical profession and the role of pharmaceutical services, and strengthening government regulation of the industry to ensure quality and safety.

Third, creating sufficient state regulation of competition in the retail pharmaceutical market. Creating conditions for fair competition, supporting small and medium-sized pharmacy business.

Fourth, organizing partnerships and collaborations. Cooperation between pharmacy chains, medical centers, scientific and research centers, and public organizations to jointly solve urgent problems.

The quality of economic growth of pharmacy chains and sustainable development of retail pharmacy require a careful and balanced approach. Only through a combination of modern, correct and strong-willed decisions based on concrete facts, social responsibility and active participation of the state is it possible to ensure the long-term well-being of the pharmaceutical industry and improve the health of the nation.

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利用可持续增长的通货膨胀模型进行短期收入预测的有效方法
**AN EFFECTIVE METHOD FOR SHORT-TERM FORECASTING OF
 REVENUE USING THE INFLATION MODEL OF SUSTAINABLE
 GROWTH**

Belykh Vasily Viktorovich

*Candidate of Physical and Mathematical Sciences, Associate Professor
 Novosibirsk State University of Economics and Management "NSUEM"*

注释。本文提出了一种基于可持续增长模型的收入预测方法，该方法考虑了借款成本、产品价格和生产资料的变化。该方法对模型进行了随机修正，并考虑了经济不确定性。预测期限定于年度财务报表规定的时间段。所述预测方法不具备长期记忆性，因此所得结果不受先前确定的趋势的约束。利用这种新方法无需进行劳动密集型计算和专门培训。

关键词：可持续增长、增长因素、布朗运动、不确定性、通货膨胀、预测、收入。

Annotation. *A method for forecasting revenue based on a sustainable growth model that takes into account changes in the cost of borrowed funds, prices for products and means of production is proposed. A stochastic modification of the model is used, taking into account economic uncertainty. The forecasting horizon is limited to the period specified by the annual financial statements. The described forecasting method does not have a long memory, so the result obtained is not tied to a previously established trend. To take advantage of the new approach, labor-intensive calculations and special training are not required.*

Keywords: *sustainable growth, growth factors, Brownian motion, uncertainty, inflation, forecast, revenue.*

1. Model

1.1. Stochastic process

We divide the time axis into segments of duration T equal to the revenue generation interval S_t . We describe its behavior on segment n using geometric Brownian motion, assuming that financial coefficients do not change much over a short period of time:

$$dS_t = g_n S_t dt + \sigma_n S_t dW_t, \quad (1)$$

where t is the time in the range from nT to $(n+1)T$; g_n and σ_n — drift and volatility parameters defined by piecewise constant functions; W_t — Wiener process.

Thus, throughout the life of an enterprise, its revenue is represented by a stochastic process, divided into segments of duration T , with abruptly changing drift and volatility parameters.

Taking into account changes in prices for products and production resources, the drift parameter g_n in equation (1) is equal to [1]:

$$\begin{aligned} g_n = & b_n \{m_n + z_n(1 - \phi_n) - \\ & - e_n \alpha_n(1 - \phi_n) [\beta_{1,n}(C_n + I_n - L_n) + \beta_{2,n}F_n] + \\ & + j_n F_n(\kappa_n + o_n)(1 - \phi_n) + \\ & + j_n [I_n + F_n - F_n(\kappa_n + o_n)]\} \times \\ & \times [(1 - \beta_{1,n})(C_n + I_n - L_n) + (1 - \beta_{2,n})F_n]^{-1}, \end{aligned} \quad (2)$$

where b_n is the investment ratio, taking into account settlements with shareholders; m_n is the return on sales, equal to the ratio of net profit to revenue S_n ; C_n is the ratio of cash and net accounts receivable to annual revenue; L_n is the ratio of accounts payable and other spontaneous liabilities to annual revenue; I_n is the ratio of inventories to annual revenue; F_n is the ratio of net fixed assets to annual revenue; κ_n is the depreciation rate; o_n — the rate of unexpected depreciation;

$\beta_{1,n} = \frac{D_{1,n}}{(C_n + I_n - L_n)S_n}$ — the share of working capital financed by debt $D_{1,n}$; ϕ_n — the income tax rate; $\beta_{2,n} = \frac{D_{2,n}}{F_n S_n}$ — the share of fixed assets financed by debt $D_{2,n}$; α_n — the share of debt with a freely floating interest rate; $z_n = i_n - j_n$ — spread between the inflation rates of prices for output i_n and inputs j_n ; e_n — adjustment of the interest rate on borrowed funds in connection with inflation.

Equation (2) takes into account the growth of equity capital through the issue of shares (in this case $b_i > 1$), due to retained earnings and revaluation of enterprise assets.

1.2. Basic equation

By integrating (1) (see [2]), we obtain an equation for the logarithm of the periodic revenue growth rate $u_n = \ln(S_n/S_{n-1})$:

$$u_n = (g_n - 0,5\sigma_n^2)T + \sigma_n W_{n,T}, \quad (3)$$

where $W_{n,T}$ is a Wiener process of duration T on the interval n .

From the model (3) it follows that the time series u_n is described by the mathematical expectation

$$E(u_n) = (g_n - 0,5\sigma_n^2)T \quad (4)$$

and standard deviation

$$\sigma(u_n) = \sigma_n \sqrt{T}. \quad (5)$$

1.3. Forecasting method

When constructing a forecast for period n , we will proceed from the following assumptions:

1. The adjustment of profit associated with changes in prices of products and production resources, the cost of borrowed funds, is calculated on the basis of the forecast values of z and j for period n .
2. The company makes efforts to optimize cash balances, accounts receivable and inventories, therefore, normalized values of the coefficients C and I are used in forecasting.
3. It is assumed that the inertial coefficients, which characterize the investment and financial policy as well as the turnover of fixed assets, are in effect; therefore, in forecasting, the values of b , β , and F from the previous period ($n-1$) are used.
4. The statutory income tax rate and depreciation rate are known in advance, therefore, when forecasting φ , κ , α , the values related to the forecast period n are used.
5. The level of revenue uncertainty changes very slowly, so it is described by the constant σ . This condition is violated during periods of economic crisis, leading to a jump-like growth of the indicator.

Taking $T = 1$, after substituting the drift parameter (2) into (4) and arranging the indices for the financial coefficients in accordance with paragraphs 1–5, we obtain a discrete stochastic inflation model of sustainable growth:

$$\begin{aligned}
 E(u_n) = & b_{n-1}\{m_{n-1} + z_n(1 - \phi_n) - \\
 & - e_n \alpha_n(1 - \phi_n)[\beta_{1,n-1}(C + I - L_{n-1}) + \beta_{2,n-1}F_{n-1}] + \\
 & + j_n F_{n-1}(\kappa_n + \alpha_n)(1 - \phi_n) + \\
 & + j_n[I + F_{n-1} - F_{n-1}(\kappa_n + \alpha_n)]\} \times \\
 & \times [(1 - \beta_{1,n-1})(C + I - L_{n-1}) + (1 - \beta_{2,n-1})F_{n-1}]^{-1} - 0,5\sigma^2.
 \end{aligned} \tag{6}$$

The forecast potential of the model (6) is based on the prediction of the price level for the enterprise's products and services (see item 1) and on the fact that the enterprise controls the level of current assets (see item 2). Long-term contracts with suppliers and consumers with data on prices in the next period of time, supplemented by materials from macroeconomic and industry studies, can serve as a source of reliable information about the future. By comparing the observed and normalized values of the coefficients C and I , the enterprise receives objective information about the relationship between supply and demand for its products.

2. Results

2.1. Initial data

Let us analyze the dynamics of the annual revenue of the coal mining enterprise PJSC Kuzbasskaya Toplivnaya Company using the model (6) (Fig. 1). The source of accounting information was the SKRIN database. The unidirectional movement of the growth rate and the rate spread z_i indicates the dominant role of

the price growth factor. The forecasting errors are due to errors in determining the prices of the enterprise's production resources, because the macroeconomic index that served as the basis for the model calculations differs from the actual one. In addition, the accuracy of the analysis before 2004 is reflected in the fact that before receiving the license, the enterprise was not engaged in coal mining, which is why the prices for coal products did not have the same strong influence on its activities as in the subsequent time. Frequency analysis shows the concentration of the residuals of the model (6) in the zero interval of the histogram (Fig. 2). With an average value of -3.0% and a standard deviation of 29%, the difference between the average and zero is statistically insignificant. Comparison of standard deviations of two parts of the time series, represented by residuals, confirmed the hypothesis of their equality, therefore, when modeling the growth rate for all n , the value $\sigma = 29\%$ was used. Checking the residuals using a series of tests confirmed their normality at a significance level of 0.05, which allows using interval estimates when forecasting growth. According to the presented data, model (6) is in good agreement with the observation results, accurately predicting a change in the direction of movement of the analyzed indicator in the next period of time.

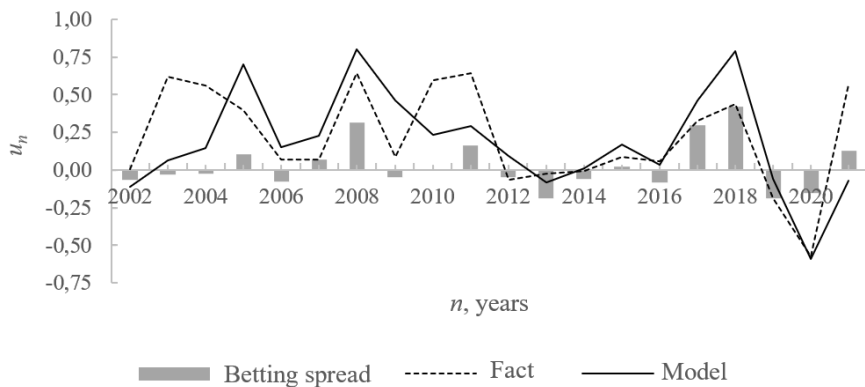


Figure 1. Forecast of the logarithm of revenue growth rate

3. Discussion

The proposed forecasting method focuses on the fundamental links between growth and its causes, which allows us to consider its forecasting potential theoretically, based on patterns and observations from different areas of economic science.

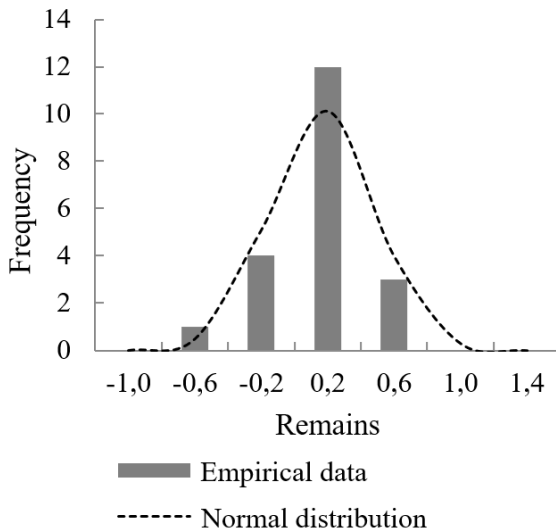


Figure 2. Histogram of residuals

3.1. Price and offer

It follows from the law of supply and demand that the level of buyer interest in a product directly affects its price, as a result, the price and supply move in the same direction. This rule corresponds to the price adjustments to the profitability of sales, provided by the model (6). According to it, the growth rate of an enterprise is determined by the dynamics of net profit, the size of which is proportional to the spread of prices for products and means of production. The calculation takes into account the production capabilities of the enterprise. The proposed forecasting method will be especially effective in relation to raw materials enterprises, where price volatility is one of the main strategic risks.

3.2. Studying demand through experiment

Marketing research is not the only way to study demand. The results of the enterprise's activities in the reporting period can be interpreted as the result of an experiment showing the current ratio of production volumes and demand. The enterprise receives «information about demand by putting a certain amount of goods up for sale at a certain price and observing how much of this amount was sold» [3]. When using this approach, deviation from the standardized values of asset turnover consumed during the operating cycle serves as a signal of an imbalance in supply and demand. It allows for the launch of a mechanism for correcting the production program [4], helping to maintain turnover ratios at specified levels.

3.3. Inflationary profit

The proposed forecasting method is effective in periods of long-term high inflation, when «production development is determined by price factors, not by free competition and not by increasing production efficiency» [5]. Such an economic situation developed in the Russian Federation in 2003-2007. Due to uneven growth in prices for goods, there was a redistribution of income between producers. Those who found themselves in a better position received an impetus for accelerated development, while the growth of others slowed down or stopped.

3.4. Scenario analysis

In addition to endogenous variables, macroeconomic indicators are regularly included in the forecast model variables [6]. By correlating the probabilities of occurrence of significant economic events with growth factors, the model (6) allows applying scenario analysis to them. The leading nature of the information contained in the scenarios is the reason that the short-term forecast may differ significantly from the trend detected based on the analysis of historical data.

Conclusion

The proposed forecasting method takes into account the production and financial capabilities of the enterprise, allowing the inclusion of expected values of growth factors in the analysis. Since it is not tied to established trends, it is more effective in constructing short-term forecasts compared to models based on the analysis of historical data.

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特许经营的演变：从严格的标准化到混合管理模式

THE EVOLUTION OF FRANCHISING: FROM STRICT STANDARDIZATION TO HYBRID MANAGEMENT MODELS

Suyazov Vladimir Nikolaevich

Candidate of Economic Sciences, Associate Professor

Russian International Academy of Tourism

ORCID ID : 0009-0009-8630-6679

摘要：本文探讨了特许经营模式的多维性，指出它仍然是最有效的商业合作模式之一，兼具可扩展性和降低创业者风险的优势，但其成功取决于标准化与适应性、法律清晰性与管理灵活性之间的复杂平衡，以及数字技术的引入。本文详细分析了特许经营的关键方面，包括法律框架、组织结构、创新以及特许人与受许人之间关系的管理。本文以麦当劳、星巴克、肯德基等公司为例，分析了成功的做法以及导致冲突或增长放缓的常见错误。本文特别关注数字化在特许经营网络转型中的作用，以及考虑本地市场特征的必要性。研究结果表明，最佳特许经营模式需要一种将关键流程统一化与适应区域条件的能力相结合的综合方法。

关键词：特许经营、标准化、适应性、业务数字化、混合业务模式、数字化。

Abstract. *This article examines the multidimensionality of the franchising model, noting that it remains one of the most effective models of business cooperation, combining the advantages of scalability and risk reduction for entrepreneurs, while its success depends on a complex balance between standardization and adaptability, legal clarity and management flexibility, as well as the introduction of digital technologies. Key aspects of franchising are analyzed in detail, including the legal framework, organizational structure, innovation and management of relations between the franchisor and franchisee. Using the example of such companies as McDonald's , Starbucks , KFC and others, successful practices and common mistakes leading to conflicts or slowdowns in growth are analyzed. Particular attention is paid to the role of digitalization in the transformation of franchise networks and the need to take into account local market characteristics. The results of the study demonstrate that the optimal franchising model requires an integrated approach combining the unification of key processes with the ability to adapt to regional conditions.*

Keywords: *franchising, standardization, adaptability, digitalization of business, hybrid business models, digitalization.*

The franchise model in modern economic realities is one of the optimal types of business cooperation, where the parent company provides the partner with the authority of its trademark, achievements in the field of innovation and effective management methods. This business model, at first glance, is simple - the essence is in the transfer of a full-fledged business scheme together with management standards - but in fact it reveals a complex range of details. This cooperation reduces financial risks for beginning entrepreneurs, giving the opportunity to conduct business under the protection of an already established brand and pre-verified procedures. At the same time, strict regulations and the need to strictly adhere to corporate standards can limit the entrepreneur's creativity and freedom of action, giving rise to potential conflicts with the franchisor.

An important area is the issues of digital franchising technologies and their impact on improving business efficiency, which are discussed in detail in [1–5]. The study shows that the introduction of online platforms for training, control and analytics significantly simplifies the scaling process, since the franchisor gets the opportunity to monitor the work of all network participants in real time. At the same time, the author points out the need to take into account local features of the information infrastructure and cultural factors, otherwise attempts at total standardization may result in increased internal costs and difficult interaction.

It is also important to consider the organizational aspect: ensuring transparency in financial reporting, protecting intellectual property rights and building mutually beneficial relationships with local suppliers. This involves creating a legal framework that must be clearly formulated and meet the protection of the interests of both parties. However, even with clear agreements, there are difficulties in maintaining quality standards, for example, any interaction with consumers can either contribute to strengthening the company's image or provoke reputational risks.

Franchising is a complex scheme that encompasses not only the copying of a successful business model, but also includes complex organizational, legal and technical aspects that are subject to continuous transformation. In this regard, a detailed analysis of the key difficulties and growth potential of this model must certainly take into account the volatility of international markets, changes in consumer preferences, as well as the active introduction of digital technologies. These factors, acting as powerful catalysts for development, can simultaneously reveal existing imbalances and become a reason for adjusting established management approaches.

To analyze issues related to franchising, an analytical review of publicly available information was conducted from various enterprises operating under a franchise and disclosing key aspects of their work through annual reports and other available sources. This research method provides the opportunity to compare actual economic results with theoretical calculations presented in scientific papers.

The emphasis is on studying information on trends in sales and income, periods of reaching break-even points for franchises, the size of license fees and payments for the use of the brand, as well as the effectiveness of logistics and marketing management. Based on the collected array of data, an assessment is made of examples of successful and less successful franchising, allowing to identify key success factors and common mistakes of business structures that have encountered problems.

The results of the study reveal key trends that will shape the future of franchising, among which, first of all, we can highlight the importance of an integrated approach that includes legal, managerial and technological strategies. Furthermore, the growing importance of digitalization places demands not only on the technical equipment of the business, but also on its adaptation to the digital ecosystem, taking into account intercultural differences and the specifics of the local market. In addition, legal issues, especially trademark registration and intellectual property protection, undoubtedly remain fundamental to ensuring the sustainability and success of the franchise. Together, these aspects determine the topics for future research in this area on the improvement and progress of franchising as a key element of entrepreneurial practice.

A detailed examination of the data revealed several interconnected elements that significantly influence the progress and current status of franchising, as well as outline the contours of its future development. Certain patterns that contradict expectations were also noted, further highlighting the complexity and volatility of this business model.

Digitalization has become a key factor accelerating changes in business processes. Franchise companies that invest in the development of web platforms for management and educational purposes, electronic document management tools and data analysis programs have demonstrated greater adaptability to changes in the market. However, thoughtless implementation of IT solutions without taking into account the specifics of local business, when business entities are not ready to adapt to new conditions or face cultural and technological barriers, often leads to fragmentation and disunity of the network and a drop in efficiency in information exchange.

The second important aspect concerns legal issues related to trademark registration, securing intellectual property rights and defining the obligations of the parties. Research shows that in situations where legal clarity was ensured (including prompt trademark registration and detailed rights in contracts), the number of disputes was significantly reduced. In contexts where legal documentation was unclear or too broad, the risk of various problems increased, including illegal reproduction of key aspects of the business and attacks on brand reputation. Therefore, a solid legal basis is the backbone without which the most innovative technologies may not be viable.

Third, the theory that the conflict between the desire for strict standardization and the need to adapt to regional conditions can stimulate development or, conversely, lead to regression was confirmed. On the one hand, global standards increase brand recognition and guarantee consistent product quality. On the other hand, excessive strictness causes rejection by franchisees for whom local needs indicate the need for an individualized approach to service or pricing. The best practices revealed the use of a hybrid approach: a foundation of unchangeable standards and business processes with the ability to adapt them (assortment personalization, marketing strategies and service procedures) taking into account the unique requirements of the market.

The study reveals the complex multidimensionality of franchising, highlighting the importance of legal, structural and innovative factors in its evolution. Integrated management, covering the various elements listed in Table 1, helps to achieve an optimal combination of versatility and adaptability. The main dilemma here is finding a balance between the uniformity that the franchisor seeks to increase recognition and maintain the quality of its offerings, and the need for its units to modify operational processes in accordance with the unique needs of the local market. At the same time, strict standardization, despite its advantages in brand formation, can limit the adaptability of the business, cause tension in relations with franchise partners and slow down its growth in a dynamically changing market.

Table 1
Multidimensionality of franchising

Factor	Description	Examples
Legal aspects	Legal norms governing the relationship between the franchisor and the franchisee.	McDonald's contract, strictly regulating work standards. - Subway disputes with franchisees due to strict contract terms.
Structural factors	Organizational model of a franchise network.	- KFC: centralized supply management. - 7-Eleven: flexibility in assortment according to local demand.
Innovations	Implementation of new technologies and adaptation to market changes.	- Starbucks: Using mobile ordering and contactless payment. - Domino's Pizza: delivery robots and AI demand analytics.
Standardization	Uniform requirements for a product/service to maintain the brand.	- All Burger restaurants King use the same recipes. - IKEA requires a unified design of stores.

Adaptability	Flexibility for local markets.	<ul style="list-style-type: none"> - McDonald's in India offers a vegetarian menu (no beef). - KFC in China includes rice side dishes in its menu.
Relationship Management	Balancing franchisor control and franchisee autonomy.	<ul style="list-style-type: none"> - Hilton Hotels : uniform service standards for local hotel management. - Conflicts in the Quiznos network due to high royalties and restrictions.

The study concludes that legal aspects are the basis of stability, but also a source of conflict. Such clear legal frameworks as McDonald's provide quality control and brand protection, but excessive rigidity, such as Subway, can lead to litigation and a decrease in franchisee loyalty. Balanced contracts with transparent conditions and partner support mechanisms are needed here.

Structural factors – the choice between centralization and flexibility. KFC's centralized management minimizes risks but limits adaptation. Decentralized models like 7-Eleven increase local efficiency but complicate control. Flexible structures with a single core (logistics, brand) and local variability (product range, marketing) are desirable.

Innovation is the driver of growth in the digital age, it has been found that Starbucks and Domino's technological solutions enhance competitive advantages, but require investment from franchisees. It is necessary to gradually introduce innovations with training of partners and sharing of costs.

Finding a balance between standardization and adaptability. Burger's strict standards King and IKEA strengthen the brand, but may cause rejection in some markets (for example, religious or with special tastes). At the same time, successful cases, such as McDonald's in India, KFC in China, show that local adaptation of the menu and service increases loyalty without compromising recognition. From this point of view, the franchising model can be significantly improved by a differentiated approach: uniform standards in key elements (logo, quality) plus freedom in peripheral ones (assortment, promotions).

Relationship management is a critical factor in long-term partnerships, where trust and support from franchisees such as Hilton reduce the risk of conflict, while Quiznos' pressure clearly has a negative impact on the network's development. Regular dialogue, a transparent royalty system, and joint development programs will have a beneficial effect on the efficiency of a diversified network.

As a result, according to the author, the optimal franchising model should combine:

- Legal clarity without excessive dictation.
- Structural flexibility to respond to local challenges.
- Innovations that improve efficiency and customer experience.

- Balance standards and adaptation, avoiding extremes.
- Partnerships where benefits and risks are shared fairly.

The examples of Starbucks and McDonald's demonstrate that this approach produces sustainable growth, while the failures of Quiznos or individual Subway franchisees highlight the risks of management imbalances.

Thus, successful implementation of the franchise model requires a well-thought-out strategy in which digital solutions, legal instruments and organizational mechanisms interact not in disarray, but synchronously. It is this comprehensive approach that ensures a balance between brand uniformity and freedom of local initiatives, allowing franchising to remain one of the most promising forms of business scaling in today's economic conditions.

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俄罗斯联邦经济安全状况评估

ASSESSMENT OF THE STATE OF ECONOMIC SECURITY OF THE RUSSIAN FEDERATION

Torzhenova Tatyana Vladimirovna

*Candidate of Economic Sciences, Associate Professor
Ryazan State Radio Engineering University*

Mamonov Roman Alexandrovich

*Doctor of Technical Sciences, Associate Professor, Professor
Academy of the Federal Penitentiary Service of Russia*

摘要: 本文分析了制裁压力下评估俄罗斯经济安全的主要标准, 提出了指标体系及其评估程序, 并针对其中最重要的指标设定了阈值。

关键词: 经济安全指标, 经济安全威胁。

Abstract. *The article analyzes the main criteria for assessing Russia's economic security in the context of sanctions pressure, suggests a system of indicators and a procedure for evaluating them, and presents thresholds for the most significant of them.*

Keywords: *indicators of economic security, threats to economic security.*

Currently, the high level of threats to Russia's economic security is caused by sanctions pressure, disruptions in the logistics of supplies of goods and raw materials, and the unpredictability of the political situation in the world [1]. Given the huge number of external and internal threats that undermine the country's economy, government policy should be aimed at developing human capital, a new innovative type of employee thinking, scientific and technological progress, innovation, and the development of small and medium-sized businesses [1, 2]. The state of economic security is analyzed using an objective system of parameters, criteria and indicators that determine the thresholds for the functioning of the economic system. Beyond these values, the system loses its ability for dynamic self-development, competitiveness in domestic and foreign markets, becomes the object of expansion of multinational corporations, suffers from the plundering (internal and external) of the country's national wealth, corruption, economic ties of enterprises are destroyed, and a crisis state arises [1]. In addition to a qualitative description of the economy, quantitative definition of the boundaries of safe development is

also required for the development of public policy (for example, anti-crisis measures). The criteria of economic security make it possible to assess the state of the economy.

The criterion-based safety assessment includes: - assessment of resource and natural potential; - assessment of the level of resource efficiency; - assessment of the competitiveness of the economy; - assessment of the integrity of territories and economic space; - assessment of sovereignty, independence and the possibility of countering external threats; - assessment of social stability and conditions for the prevention and resolution of social conflicts. When analyzing economic security, it is advisable to differentiate indicators into blocks, each of which is characterized by a separate set of indicators. This system of indicators should provide an opportunity to assess quantitative parameters and trends of economic security.

The first group of indicators includes: the dynamics of the cost of living, including in cents compared to the previous year; the dynamics of the population with incomes below the cost of living; the dynamics of the coefficient of differentiation of the Russian population by income.

The second group includes indicators of the production, investment, and foreign economic sectors of the Russian economy: the dynamics of growth (decline) in industry-wide labor productivity; the dynamics of changes in the index of physical volume of fixed assets; the dynamics of changes in the degree of depreciation of fixed assets; the dynamics of changes in investment shares; the dynamics of foreign and joint (foreign and Russian) investments in total investments in fixed assets, including by individual industries; dynamics and structure of agricultural production; dynamics of Russia's foreign trade turnover; the dynamics of Russia's export and import turnover by types of counterparties [3].

The third group of indicators reflects the state of the Russian financial system: dynamics of changes in the consumer price index; dynamics of changes in quantitative indicators of cash and non-cash money in the economy; dynamics of changes in the money supply; dynamics of changes in international reserves of the Russian Federation; dynamics of changes in the net financial result of organizations; dynamics of changes in the total overdue debt of organizations on obligations; dynamics of the share of unprofitable organizations in the total the number of organizations; the dynamics of the external debt of the Russian Federation [3].

The fourth group of indicators reflects the economic development of Russia at the regional level: the level of difference between the economic and social development of the subjects of the Russian Federation; the degree of security of the common economic space and interregional economic relations, subject to national interests.

The last group of indicators reflects the state of the innovation sector of the economy: the dynamics of government financing of fundamental and applied

scientific research; the dynamics of the quantitative indicator of the creation of advanced production technologies; the dynamics of the share of organizations engaged in technological innovations in the total number of organizations in some types of economic activity; the dynamics of the share of innovative goods, works and services in the total volume of products in some types economic activity.

The initial stage of assessing the economic security of a country is a preliminary analysis of the totality of macroeconomic indicators for assessing the economic security of the state and a preliminary analysis of economic security indicators. The system of economic security indicators may consist of such important indicators that are identified using 6 criteria of economic security.: 1) an indicator of investment security. According to international experience, for a country's stable economic growth, annual investments over a given period of time should be at the level of 19-25% of GDP.;

2) the volume of internal and external debts of the state is the volume of loans not repaid on a specific date, carried out by the state, respectively, in the domestic and foreign loan markets:

$$L_{dis}(L_{dfs}) = \frac{D_i(D_f)}{GDP} \cdot 100\%, \quad (1)$$

where L - is the level of debt security of the state,

L_{dis} - is an indicator for domestic debt,

L_{dfs} - is an indicator for external debt;

GDP – the level of annual GDP;

3) the deficit of the state budget, which arises as a result of the excess of budget expenditures over its revenues. The level of budget deficit for each specific year is defined as the ratio of the deficit to the annual GDP:

$$L_{bds} = \frac{BD}{GDP} \cdot 100\%, \quad (2)$$

where BD - is the amount of budget deficit.

4) the level of monetization of the economy in a particular year is calculated as the ratio of the volume of money supply by the M3 aggregate (MS M3) to the annual volume of GDP:

$$L_{ms} = \frac{MSM3}{GDP} \cdot 100\% \quad (3)$$

5) the cost of bank loans is determined by the annual interest paid by the borrower to a commercial bank for the use of his loan;

6) international reserves of the Bank of Russia. The external stability of the national currency, which is determined by the stability of its exchange rate relative to other currencies, largely depends on the level of the Bank of Russia's international reserves [4].

Thus, the stages of constructing an integrated assessment of economic security are: - formation of multiple indicators; - determination of the characteristic (optimal, threshold and limit) values of indicators; - normalization of indicators; - determination of weight coefficients; - calculation of the integral index.

The first group of threshold values of economic security indicators concerns the manufacturing sector. Russia, which claims to be a great power, should have an appropriate volume of production: the volume of GDP as a whole is 75% of the average for the G7 countries, per capita is 50% of the average for the G7 and 100% of the global average.

The main signal of violation of the requirements of the economic security of the state is a decrease in the share of industrial investments in total GDP. The decline in investment activity results in a decline in production and a deterioration in its structure, which leads to a deterioration in the position of the state in the global community. In conditions of an outstripping decline in industrial investment compared to the production of real GDP, the moral and physical degradation of industry is taking place. The required minimum investment in fixed assets is at 25% of GDP.

The second, most extensive group is the threshold values of financial condition indicators:

- the volume of domestic debt as a percentage of GDP – 30;
- the volume of external debt as a percentage of GDP – 25 %;
- budget deficit as a percentage of GDP – up to 5 %;
- money supply as a percentage of GDP – at least 50 %;
- the volume of foreign currency in cash to the volume of rubles in cash is 25%.

The lack of money supply below the threshold value indicates the underdevelopment of the banking sector, investor distrust of banks, insufficient propensity of the population to organized forms of savings, and the weak development of non-cash payments. The increase in financial and banking reserves occurs due to the infringement of financial opportunities for the development of the real sector of the economy, innovation and social spheres. Defense spending should be 3% of GDP, in fact— spending on science should be 2%.

In the financial sector, the greatest threat to the economic security of our country is the very low level of monetization of the economy. The policy of reducing inflationary processes in Russia by reducing the money supply caused a significant gap between the threshold and actual values for monetization of the economy, which led to a shortage of working capital of enterprises and their debt.

The third important group is the threshold values of indicators of the standard of living of the population. Social indicators characterize the current trends in the development of social processes in terms of the implementation of the principle of equitable distribution of benefits. Violation of this principle manifests itself in

an increase in the incomes of the dominant social strata due to a decrease in the incomes of others, not because of their large contribution to the growth of public welfare, but because of their dominant role in the distribution of benefits.

The following thresholds were previously determined in this area: the share of citizens with incomes below the subsistence level is 7%, life expectancy is 70 years, and the income ratio of 10% of the most affluent and 10% of the least affluent population (decile ratio or fund ratio) is 8 times.

One of the indicators that make it possible to signal danger in advance and take measures to prevent it is the unemployment rate. The safe parameter of the unemployment threshold corresponds to 5%. The differentiation of the subjects of the Federation in terms of the subsistence level should be 1.5 times. The share of imported food in the total volume of food resources should be a maximum of 25%.

Thus, ensuring economic security in the current situation largely depends on constant monitoring and timely identification of negative trends that can destabilize the economy. The proposed algorithm for selecting and analyzing indicators will reduce inertia in response measures and increase the level of economic security of Russia.

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对外经济活动经理的专业能力
**PROFESSIONAL COMPETENCIES OF THE MANAGER
FOREIGN ECONOMIC ACTIVITY**

Zalavskaya Alexandra Vadimovna

Postgraduate student, Assistant

Donetsk Academy of Management and Public Administration

Scientific Adviser - Beganskaya Irina Yurievna

Doctor of Economics, Associate Professor, Head of Department

Donetsk Academy of Management and Public Administration

摘要：本研究旨在研究对外经济活动经理的专业能力。本文阐述了研究对外经济活动经理需求的原因，分析了俄罗斯联邦当前发展阶段对外经济活动专家的基本要求，探讨了潜在员工的能力模型，并提出了对外经济活动经理个人培训的各个阶段。本研究的主题是对外经济活动经理的专业能力。为了实现研究目标，我们采用了常用的科学方法，即文献分析、实证研究（例如描述法和比较分析法）。研究结果推导出对外经济活动经理个人培训的各个阶段。

关键词：专业能力、经理、对外经济活动、职业、企业职业管理、员工、对外经济活动专家的要求。

Abstract. *The purpose of the work is to study the professional competencies of the manager of foreign economic activity. The article also presents the reasons for studying the requirements for managers of foreign economic activity, analyzes the basic requirements for specialists in foreign economic activity at the current stage of development of the Russian Federation, considers the competence model of a potential employee, and also presents the stages of individual training of a manager of foreign economic activity. The subject of the research in this scientific work is the professional competence of the manager of foreign economic activity. To achieve the purpose of the study, general scientific methods were used, namely, literature analysis, empirical methods such as the method of description and the method of comparative analysis. As a result of the work, the stages of individual training of the manager of foreign economic activity were deduced.*

Keywords: *professional competencies, manager, foreign economic activity, career, business career management, employee, requirements for a foreign economic activity specialist.*

Currently, the growth of international business is a key factor in the economic development of companies and even countries, since domestic growth is now linked to global economic development. Given the importance of international trade, the need for managers with the necessary competencies to solve problems related to international assignment is a prerequisite for the survival of a corporation and maintaining its competitiveness.

Due to the need to promote economic growth, business corporations, countries and non-governmental organizations should send management personnel along with the products they export to manage their new foreign acquisitions and investment partnerships. For the success of these business projects, the selected managers must be prepared to solve managerial tasks that differ from their internal environment and are inherent in a foreign assignment. It is no longer enough to master the skills of their profession, in modern global corporations, managers need to supplement their skills with the necessary competencies to work with foreign consumers, multicultural teams, suppliers, workforce, governments, technology and local politics. These competencies should be based on the interaction between communication, change, culture and cross-border trade.

A specialist in the field of foreign economic activity is a profession relevant to the current stage of development of the Russian economy. The state, which participates in the global processes of integration and globalization, requires the higher education system to train highly professional foreign economic activity managers who are able to flexibly respond to the demands of the times. At the same time, the formation of professional qualities necessary for full-fledged implementation in future professional activities among students - managers of foreign economic activity is of particular importance.

Despite the diversity of opinions and views, it should be noted that the tasks of training qualified managers with a certain set of professionally significant qualities that would allow them to successfully enter the profession, work and build a career are still far from their practical solution. The effectiveness of the management training system largely depends on the analysis and consideration of the world experience in training such specialists in foreign universities.

The main purpose of this study is to identify the competencies required by managers for successful work and the implementation of their company's strategy in international activities.

The problem of the formation of professionally significant qualities of a specialist is widely studied in modern psychological and pedagogical literature. The professionally significant qualities of an economist were considered by N. Babkov-Pilipenko, R. Geyserskaya, A. Zhironkina; a military man-A. Vinogradov, V. Golikova; teacher-R. Dear, A. Zubrova; psychologist, A. Borisjuk, K. Pilipenko; translated by T. Koknova. Also, the professionally significant qualities of future

managers were not ignored, the problem of which was dealt with by I. Gornostae-va, N. Zamkova, N. Ivanova, A. Litke, A. Petrova, G. Petruk, A. Samokhval, A. Trofimova and other researchers.

The study of requirements for specialists in the field of foreign economic activity is relevant and important for several reasons, indicated in Table 1 [1]:

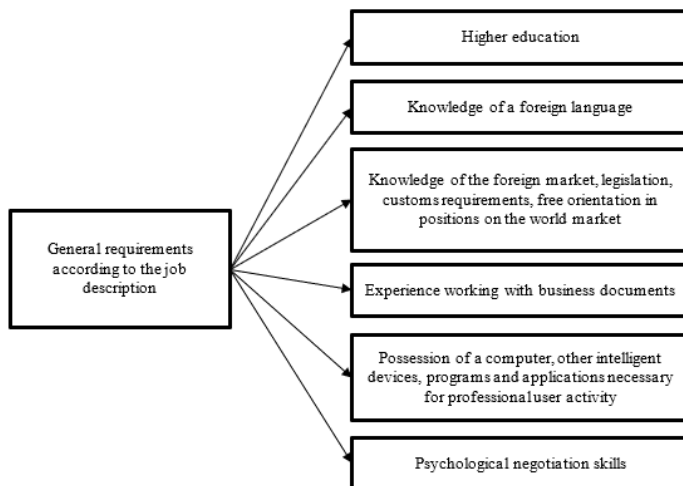
Table 1

The reasons for studying the requirements for managers of foreign economic activity

Reason	Description
1	2
Economic globalization	The modern economy is becoming more global, and foreign economic activity plays an important role in international trade and economic relations between countries. Understanding the principles and processes of foreign economic activity is essential for successful participation in the global economy
Development of international markets	International trade and investment continue to grow, opening up new opportunities for businesses and entrepreneurs. Studying foreign economic activity helps students understand international markets, look for new opportunities, and develop skills to overcome the challenges of international competition.
International economic relations	Foreign economic activity includes the establishment and maintenance of economic relations between states. Studying this field will help you understand international economic processes such as trade, investment, financial flows, and political aspects of international relations.
Career opportunities	Foreign economic relations offer a wide range of career opportunities. Students with knowledge and skills in this field can work in international companies, government agencies, consulting firms, trade associations and other organizations related to foreign economic activity.
Increasing competitiveness	Foreign economic activity is becoming increasingly important for the development of countries and economies. Studying in this specialty will allow students to acquire the necessary skills to participate in international projects, attract foreign investment, develop exports and strengthen the country's competitiveness on the world stage.

In general, the study of this issue is relevant, as it helps students to understand and adapt to global economic trends, develop intercultural skills, identify business opportunities at the international level and make effective decisions in the international business environment [2].

The general requirements for foreign economic activity specialists according to the job description are shown in Picture 1.



Picture 1. General requirements for foreign economic activity specialists

Having work experience in one of the types of foreign economic activity is an important requirement for the applicant. However, a number of personal qualities are also appreciated. They also help the specialist himself, who is engaged in such a responsible but also interesting activity.

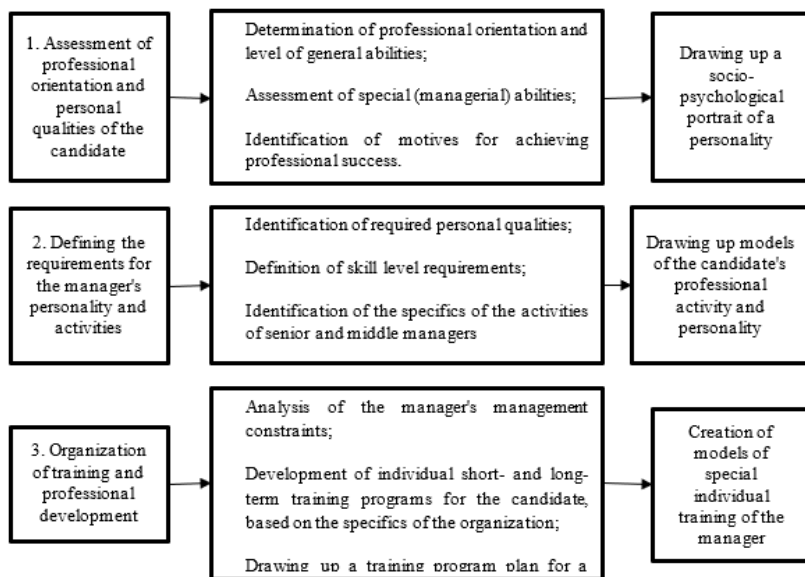
However, today, preference is given not only to the professional and business characteristics of a potential employee, but also to the personal qualities that are necessary to complete tasks. It is also necessary to take into account the unique set of corporate competencies of the organization that the future employee must meet.

Knowledge and competencies are a sustainable competitive advantage in the modern era of competitive business.

Employee training is one of the best ways to accumulate knowledge, use knowledge, update knowledge, and transfer it to other employees of the organization. It is important to pay more attention to the management of the knowledge acquisition process, as mentioned above. This is required for them to have the ability to manage themselves, the ability to make decisions, and also to take responsibility for them [4].

Employees can gain new knowledge, skills, a good attitude, as well as higher wages, better job prospects, and many other opportunities. Organizations benefit from improved communication skills, exploring the hidden talents of specialists, more productive work, and greater business profits from learning outcomes. These good results could have an impact on the development of the organization.

The stages of individual training of a manager of foreign economic activity are shown in Picture 2.



Picture 2. *The stages of individual training of the manager of foreign economic activity*

There are no most appropriate teaching methods or prescriptions. The chosen method should best meet the needs of a particular organization. When choosing a method, various factors are usually taken into account: skills, required qualifications of candidates, cost, available time, depth of knowledge, etc.

Thus, in modern market conditions, the most important tool for ensuring the stability of an enterprise and increasing its competitiveness not only in the domestic but also in the foreign market is staff development in accordance with current and future requirements of the external and internal environment. For a company that is just starting to enter international markets, it is very important to have highly qualified employees.

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国际仲裁程序的作用和不利裁决的性质

THE ROLE OF INTERNATIONAL ARBITRATION PROCEEDINGS AND THE PROPERTY OF PREJUDICIAL DECISIONS

Razumovskaya Vladislava Viktorovna

Postgraduate student

University of Management "TISBI"

摘要. 本文致力于深入分析国际仲裁裁决的偏见效应，并将其置于俄罗斯联邦国内立法和国际法准则的互动背景下。主要观点是，此类裁决的偏见效应不仅取决于传统的偏见理论，还取决于其在全球司法体系中的功能性作用。本研究以1958年《纽约公约》的核心条款为基础，该公约是世界许多国家承认和执行外国仲裁裁决的基础。作者强调了国际仲裁作为全球化背景下有效争议解决机制的重要性。裁决的偏见效应是提高国际执法实践中法律可预测性和稳定性的关键因素。

关键词： 国际仲裁，1958年联合国公约，偏见，欧洲人权法院。

Abstract. *The article is devoted to an in-depth analysis of the prejudicial effect of international arbitration decisions in the context of their interaction with the national legislation of the Russian Federation and international legal standards. The main idea is that the prejudicial effect of such decisions is determined not only by traditional doctrines of prejudice, but also by their functional role in the global system of administration of justice. The study is based on the key provisions of the New York Convention of 1958, which is the foundation for the recognition and enforcement of foreign arbitration awards in many countries of the world. The author emphasizes the importance of international arbitration as an effective dispute resolution mechanism in the context of globalization. The prejudicial effect of decisions is a critical aspect that increases legal predictability and stability in international law enforcement practice.*

Keywords: *international arbitration, UN Conventions of 1958, prejudice, European Court of Human Rights.*

Freedom of contract, which is the basis of civil law, allows the parties to independently choose the method of resolving disputes that arise. One of these recognized methods is appeal to an arbitration court, including international commercial arbitration.¹

¹ Neshataeva T.N. On the recognition and enforcement of decisions on economic disputes of the courts of the CIS member states on the territory of the Russian Federation // Journal of International Private Law. 1997. No. 2(16). P. 5

The possibility of resolving civil disputes through international arbitration, in accordance with the procedure established by law, including cases where the parties have agreed to recognize the decision of the international court as final, does not violate the constitutional right to judicial protection. The parties themselves decide how to protect their rights. If they voluntarily agree to have the dispute considered by an international court, then this court has exclusive competence, which prevails over state legal proceedings. This competence may be terminated only by mutual consent of the parties or if there are objective grounds for this.

The completeness, effectiveness and timeliness of protection are ensured by the possibility of appealing the decision of the arbitration court in a state court or obtaining a writ of execution for its compulsory execution in cases provided for by law.²

While recognizing international litigation as one of the jurisdictional forms of dispute resolution, it should be noted that a number of issues related to its application have not yet received an unambiguous interpretation. In particular, the issue of the prejudicial force of decisions of international courts remains debatable. Russian practice, which denies such force, seems to us to be inconsistent with the principles of protecting rights and contradicts the very nature of international litigation.

Doctrinal analysis and identification of modern trends in the interpretation of procedural legislation, comparison with national and international practice, including the practice of applying the 1958 UN Convention on the Recognition and Enforcement of Foreign Arbitral Awards (hereinafter referred to as the 1958 New York Convention), the positions of the European Court of Human Rights (hereinafter referred to as the ECHR), whose decisions are directly applied by state courts of the Russian Federation.³

In view of the arguments presented below, there is every reason to recognize the prejudicial nature of decisions of international commercial arbitrations, which is a logical consequence of their legal force.

All current procedural codes of the Russian Federation (the Arbitration Procedure Code, the Civil Procedure Code and the Criminal Procedure Code) contain provisions on the prejudicial effect of court decisions. This means that the facts

² para. 5, 6 clause 2 of the Ruling of the Constitutional Court of the Russian Federation dated June 1, 2010 No. 754-O-O «On the refusal to accept for consideration the complaint of the limited liability company Gazprom Export regarding the violation of constitutional rights and freedoms by Article 40 of the Federal Law «On Arbitration Courts in the Russian Federation», paragraph 1 of part 1 of Article 150 and part 1 of Article 230 of the Arbitration Procedure Code of the Russian Federation» (Bulletin of the Constitutional Court of the Russian Federation. 2010. No. 6).

³ According to the Federal Law of March 30, 1998 No. 54-FZ “On Ratification of the Convention for the Protection of Human Rights and Fundamental Freedoms and the Protocols thereto” (SZ RF. 1998. No. 14. Art. 1514).

established by a court decision that has entered into legal force are not subject to repeated proof in another trial. In particular, the Arbitration Procedure Code (Article 69) establishes that the circumstances established by the decision of an arbitration court are binding on the same court when considering another case involving the same parties. Decisions of courts of general jurisdiction and sentences in criminal cases also have a prejudicial effect for arbitration courts in relation to the facts established by them that are relevant to the case under consideration.

The absence of a reference to decisions of arbitration and international arbitration tribunals in Article 69 of the Arbitration Procedure Code of the Russian Federation (as well as in Articles 61 of the Civil Procedure Code of the Russian Federation and 90 of the Criminal Procedure Code of the Russian Federation) does not mean that decisions of international arbitration tribunals do not have prejudicial force.

Prejudice - this is “a property of a judicial act that has entered into legal force, according to which the facts established by the judicial act are mandatory when considering other cases involving these parties”⁴

Facts recognized by the court that have a prejudicial effect cannot be reviewed or challenged in another trial until the relevant court decision is overturned in accordance with the procedure established by law. Thus, prejudiciality implies not only exemption from re-proving these facts, but also a direct ban on their refutation.⁵

The theoretical understanding of prejudice coincides with how this concept is interpreted by the Constitutional Court of the Russian Federation (CCRF).

The main idea of these legal positions, most clearly formulated in the Resolution of the Constitutional Court of the Russian Federation of December 21, 2011 No. 30-P “On the case of verifying the constitutionality of the provisions of Article 90 of the Criminal Procedure Code of the Russian Federation in connection with the complaint of citizens V.D. Vlasenko and E.A. Vlasenko”⁶

- Prejudice serves to ensure consistency of judicial decisions and maintain legal certainty by ensuring that similar circumstances are not interpreted differently by the courts.

- The introduction of the institution of prejudice requires a balanced approach, taking into account both the need for universal bindingness and consistency of judicial acts, as well as the independence of judges and the adversarial nature of the judicial process. This balance is achieved by clearly defining the boundaries of the effect of prejudice and establishing a procedure for its refutation.

⁴ Kostin A.A. The Problem of Prejudicial Force of Decisions of International Commercial Arbitrations in the Legislation of the Russian Federation // Actual Problems of Russian Law. 2014. No. 3. P. 493-498.

⁵ Novoselova L.A., Rozhkova M.A. On the issue of the force of judicial acts of the arbitration court // Bulletin of the Supreme Arbitration Court of the Russian Federation. 2003. No. 5.

⁶ Bulletin of the Constitutional Court of the Russian Federation. 2012. No. 1.

- The limits of prejudice are determined by the fact that facts established by the court in one case may have a different meaning in another case, since the subject of proof in different types of legal proceedings differs. Courts are limited by their competence within the framework of a specific type of legal proceedings (for example, establishing guilt as an element of a crime is not within the competence of a civil court).

The property of prejudiciality excludes the possibility of repeated and different legal assessment of the same factual circumstances, previously established by a judicial act that has entered into legal force, with the participation of the same persons. Taking into account prejudiciality ensures the implementation of the legal force of a judicial decision, including its irrefutability and binding nature, and also contributes to maintaining uniformity of judicial practice and legal certainty, which is the basis of public order in the Russian Federation.⁷

The binding nature of international arbitration decisions for Russia is enshrined in two key documents: the Constitution of the Russian Federation (clause 4, Article 15), which includes international treaties in the country's legal system, and the New York Convention of 1958. According to Article III of this Convention, each member state is obliged to recognize arbitration decisions as having binding legal force and ensure their execution, while being guided by the procedural rules in force on its territory.

The requirement to undergo the procedure for recognition and enforcement of international arbitration awards in a state other than the place where the arbitration was held does not deprive these awards of their binding nature until they are officially recognized. On the contrary, the content of the wording of Article III of the 1958 New York Convention is precisely due to the fact that international arbitration awards are subject to recognition and enforcement precisely because of their binding force.

Recognition and enforcement of international arbitration awards is not a condition for their entry into legal force. Such awards acquire legal force immediately after their issuance and are subject to voluntary execution by the parties. The procedure for recognition and enforcement is used exclusively in situations where one of the parties evades voluntary execution of the award. It is emphasized that this procedure does not establish, but only confirms the legal force of the international arbitration award, equating it to the force of the award issued by a national court.

There is an understanding in the international community that justice based on law is not limited to the state judicial system. The European Court of Human Rights (ECHR) has confirmed this by stating that the concept of "court" in Article

⁷ Commentary on the Arbitration Procedure Code of the Russian Federation (article by article) / N.V. Alekseeva, A.A. Arifulin, G.A. Zhilin, et al.; Ed. D.A. Fursov. Moscow: Prospect, 2011.

6 of the European Convention on Human Rights is not limited to traditional state courts.⁸

According to N.Y. Erpyleva, recognition of international arbitration decisions as prejudicial is necessary for the effective functioning of international trade, since the development of economic ties between companies from different countries requires mutual recognition of the legal consequences of cross-border transactions and events.⁹ Similar conclusions are contained in the works of V.V. Yarkov and S.A. Kurochkin

The application of the New York Convention of 1958, as well as the requirements of legal certainty and consistency of judicial decisions, logically lead to the recognition of the prejudicial force of decisions of international arbitrations.

A similar position is reflected in the Determination of the Supreme Arbitration Court of the Russian Federation dated August 27, 2012 No. VAS-17458/11, which concluded that decisions of international commercial arbitrations and decisions of state courts have equal legal force.

In the decision in the *Etesh Mimarlik Muhendishlik v. Turkey* case, the ECHR, relying on Article 6 of the Convention on Human Rights, stated that State courts are obliged to take into account the facts established by foreign jurisdictional authorities in order to ensure a fair trial for all parties.¹⁰

The prejudicial effect of international arbitration decisions is determined not only by the doctrinal grounds for prejudicial effect, but also by their functional place in the system of administration of justice. This statement is confirmed by the provisions and practice of the application of the New York Convention of 1958, as well as in the legal positions of the European Court of Human Rights. The incorporation of the latter into the Russian legal system (by virtue of Part 4 of Article 15 of the Constitution of the Russian Federation) determines the imperative nature of the interpretation of the norms of national procedural law in the direction of recognizing equal legal force and, as a consequence, equal prejudicial effect of decisions of state courts and international arbitrations.

In conclusion, it should be emphasized that individual erroneous statements by national authorities should not call into question the significance of international proceedings. In this regard, recognition of the binding force of decisions of international arbitration courts seems justified. Any other approach not only violates the generally recognized norms and principles of international law, but is also capable of causing serious damage to the reputation of our judicial system and the country as a whole.

⁸ paragraph 76 of the ECtHR judgment of 28 June 1984 in the case of *Campbell and Fell v. the United Kingdom* (Official database of ECtHR decisions: www.echr.coe.int).

⁹ Erpyleva N.Yu. International commercial arbitration: institutional and normative mechanism of legal regulation // *Legislation and Economics*. 2011. No. 1. P. 38-58.

¹⁰ Official database of ECHR decisions: www.echr.coe.int.

土库曼斯坦的永久中立：国际法基本原则
**PERMANENT NEUTRALITY OF TURKMENISTAN:
FUNDAMENTALS OF INTERNATIONAL LAW**

Chariyev Toyly Saparvelievich

Lawyer

Ashgabat city, Turkmenistan

注释：土库曼斯坦国与许多国家缔结了关于友好合作、互信、发展相互协作等的双边和多边协定。经济合作组织第三次峰会后的《伊斯兰堡宣言》和不结盟运动第二次国家元首和政府首脑会议的《最后文件》被视为国际社会对土库曼斯坦永久中立法律地位的承认。联合国大会的一系列决议不仅构成了土库曼斯坦永久中立地位的国际法律基础，而且对国际法的发展产生了积极影响。

关键词：联合国、大会、决议、土库曼斯坦永久中立、地位、法律、国际组织。

Annotation. *The State of Turkmenistan has concluded bilateral and multilateral agreements with a number of countries on friendship and cooperation, trust, development of interaction, and others. The Islamabad Declaration following the third summit of the Economic Cooperation Organization and the Final Document of the Second Conference of Heads of State and Government of the Non-Aligned Movement are considered international recognitions of the legal status of permanent neutrality of Turkmenistan. A number of resolutions of the United Nations General Assembly not only form the international legal basis for the status of permanent neutrality of Turkmenistan, but also have a positive impact on the development of international law.*

Keywords: *United Nations, General Assembly, Resolution, Permanent neutrality of Turkmenistan, status, legal, International organization.*

At the end of the 19th century, or more precisely on March 15, 1995, following the results of the third summit of heads of state and government of the Economic Cooperation Organization, held in Pakistan, the Islamabad Declaration was adopted. According to the contents of the declaration, the legal status of permanent neutrality of Turkmenistan was recognized at the international level for the first time. Then, on October 20, 1995, the second conference of heads of state and government of the Non-Aligned Movement was held in Cartagena (Colombia). According to the contents of the final document of the conference, the legal status

of permanent neutrality of Turkmenistan was recognized for the second time in international organizations. “The basis of Turkmenistan’s foreign policy remains the neutral status recognized in 1995 by the Economic Cooperation Organization, the Non-Aligned Movement and the UN General Assembly” [1]. The Islamabad Declaration and the Final Document of the Second Conference of Heads of State and Government of the Non-Aligned Movement would be correctly described as documents adopted in a free and open environment.

On December 12, 1995, the 90th plenary meeting of the 50th anniversary session of the United Nations General Assembly was held. At the session, the General Assembly adopted the first resolution on the permanent neutrality of Turkmenistan in accordance with the relevant part of resolution 50/80 in support of international security. The content of the resolution clearly and distinctly states that the General Assembly recognizes and supports the legal status of permanent neutrality proclaimed by the state of Turkmenistan. “Recognizes and supports the status of permanent neutrality proclaimed by Turkmenistan” [2].

The relevant part of the resolution 50/80 of the General Assembly of the United Nations of December 12, 1995 became a document testifying to the improvement of international legal norms in its content. Because this document became the first resolution in the half-century history of the organization, and such a document had never been adopted in the entire history of the General Assembly since the foundation of the organization in the last century.

The legal status of permanent neutrality of Turkmenistan remained unchanged until 2015 in accordance with the existing and established requirements of international law. The Islamabad Declaration of the Heads of State and Government of the Economic Cooperation Organization, the Final Document of the II Conference of Heads of State and Chairman of the Government of the Non-Aligned Movement and the relevant part of the United Nations General Assembly resolution 50/80. These provisions have benefited Turkmenistan and the countries of the region, including the states located on the shores of the Caspian Sea.

Within the framework of the agenda of the 69th session of the United Nations General Assembly, held on June 3, 2015, the General Assembly of the Organization adopts a new resolution 69/285. According to the content of the resolution, since the General Assembly refers to the relevant part of its Resolution 50/80 of December 12, 1995, it is obvious that a new resolution on the permanent neutrality of Turkmenistan has been adopted, the second in the history of the United Nations. This is indicated in Part 1 of this Resolution, which “affirms support for the status of permanent neutrality proclaimed by Turkmenistan” [3].

General Assembly resolution 69/285 of 3 June 2015 supplemented the relevant part of the Organization’s resolution 50/80 of 12 December 1995. It is also a document that clearly demonstrates the further development of international law.

At the 61st plenary meeting of the 79th session of the United Nations General Assembly, held on 21 March 2025, the General Assembly, in support of the peaceful existence of the world order, adopted a new, third resolution on the permanent neutrality of Turkmenistan. About this “The United Nations General Assembly on Friday unanimously approved the Resolution “Permanent Neutrality of Turkmenistan” [4].

The Resolution on the Permanent Neutrality of Turkmenistan, adopted on March 21, 2025, demonstrates the need for continuous improvement of international law for the sake of a bright future for humanity and all nations on the globe. It is fair to note that since the declaration of independence, the state of Turkmenistan has maintained its commitment to the legal status of permanent neutrality.

The fundamental norms of international law of the General Assembly of the United Nations concerning the status of permanent neutrality of Turkmenistan are currently being improved in accordance with the requirements of the time. It is advisable to constantly improve the norms of international law necessary to ensure the peaceful coexistence of peoples.

Following the adoption of General Assembly resolution 69/285 on the permanent neutrality of Turkmenistan on 3 June 2015, the State of Turkmenistan continued to adhere to its legal status of permanent neutrality. The State of Turkmenistan advocates the resolution of all issues that have arisen in foreign policy, and the holding of negotiations. The same diplomatic methods were used as today. As a result of many years of negotiations, the State of Turkmenistan took direct part in the adoption of modern, advanced legal norms that not only complement international law. For example, «Convention on the Legal Status of the Caspian Sea» [5].

In many scientific literatures, a number of scientists still express doubts about the compliance of the legal status of permanent neutrality of Turkmenistan with the norms of international law. The expression of different views and opinions can be considered unfounded. It should be noted that the grounds for such suspicions are incorrect. This is due to the fact that the General Assembly of the United Nations is fundamentally different from other international organizations in that it has the authority to adopt resolutions on the legal status of permanent neutrality of the state. “It should be noted that the resolution of the General Assembly of the United Nations No. 50/80A of December 12, 1995 is an act of an international organization” [5]. In addition, if we look at the root cause of the emergence and creation of existing doubts, it seems that the purpose of the creation of the United Nations is forgotten, ignoring the missions of the organization. Therefore, it is fair to say that when considering the issue of whether the legal status of permanent neutrality of Turkmenistan is subject to legal norms, a comprehensive and in-depth study of the norms of international law is necessary.

For the sake of a bright future for humanity and ensuring a peaceful and calm life, it is necessary to continue to improve international law. It would be right to

assign a greater role to preventive diplomacy in order to reliably ensure a peaceful and calm life for citizens around the world.

It is impossible not to notice a number of humanitarian moments related to the inalienable rights of nations in the Charter of the United Nations, the General Assembly resolutions on the permanent neutrality of Turkmenistan and a number of other resolutions. It is wrong to deny that the General Assembly resolutions on the permanent neutral legal status of Turkmenistan do not comply with the established norms of international law. Because the resolution not only replaces documents adopted by a number of other international organizations and subject to implementation, but is also closely and firmly connected with these documents.

It is fair to say that the legal status of permanent neutrality of Turkmenistan is indisputably recognized not only by neighboring states or strategic partner states, but also by a number of other states. To a certain extent, this can be compared with the legal status of neutrality of a number of states that declared neutrality before 1995 in the last century.

Since its declaration of independence, Turkmenistan has established bilateral and multilateral political, economic and other relations with a number of countries around the world. The legal status of Turkmenistan's permanent neutrality has a positive effect on its relations with foreign countries. In such relations, the state of Turkmenistan continues to pursue a peaceful policy, without interfering in the internal affairs of other states and advocating for the peaceful resolution of all issues by existing diplomatic methods, in a peaceful and friendly manner.

Resolutions of the General Assembly of the United Nations on the permanent neutrality of Turkmenistan can rightfully be considered as documents adopted in an open and free form for the expression of opinions of the member states of the organization. This gives grounds to conclude that the resolutions of the General Assembly on the legal status of the permanent neutrality of Turkmenistan meet modern requirements. Because the method of adopting resolutions creates the necessary opportunities for representatives of member states to freely and openly express the opinions of their countries in public.

At present, the state of Turkmenistan is guided by humanitarian principles in its domestic and foreign policy. In the name of the bright future of humanity, the state of Turkmenistan continues to consistently and widely participate in the further development of international law.

The modernization of international law is being carried out in a timely manner. In implementing or adopting current rules, as planned, it is necessary to continue to take into account the interests of all nations and states. Ensuring equality of parties in concluding bilateral and multilateral agreements will help prevent disputes that may arise over time. It would be beneficial for the bright future of peoples and states if international legal norms were improved through regular open discussions and votes.

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俄罗斯社会经济发展面临的挑战、趋势及商业机构在其中的作用
**CHALLENGES AND TRENDS IN RUSSIA'S SOCIO-ECONOMIC
DEVELOPMENT AND THE ROLE OF BUSINESS INSTITUTIONS
IN IT**

Airapetian Iurii

Postgraduate student

*Russian Presidential Academy of National Economy and Public
Administration,
Moscow, Russian Federation*

注释：在现代国家体系中，不仅国家机构，还有众多社会和政治组织参与保障社会经济领域的发展。与此同时，中小企业等组织的作用尚未明确，也未得到充分重视。因此，思考俄罗斯社会经济发展面临的挑战和趋势，并明确中小企业在其中的作用，成为一项重要的研究任务，也是本研究的目的。本文的方法论基础是系统性方法和非系统性方法的结合。研究结果证实，中小企业的社会活动在当前阶段得到有效实施，为俄罗斯联邦的社会经济发展做出了贡献，有助于提高俄罗斯公民的生活水平，并增强其在国际舞台上的地位。

关键词：俄罗斯联邦，社会经济发展，中小企业，企业，社会，国家。

Annotation. *In the modern state system, not only state institutions, but also numerous social and political organizations are engaged in ensuring the development of socio-economic sphere. At the same time the role of such structures as small and medium entrepreneurship remains undefined and insufficiently taken into account. This makes the consideration of the challenges and trends of socio-economic development of Russia and the definition of the role of small and medium-sized businesses in it an important research task and the purpose of this study. The methodological basis of the article was a complex combining systemic and non-institutional approaches. The result of the work was the confirmation that the social activities of SMEs are realized at the current stage, contributing to the socio-economic development of the Russian Federation and contributing to the improvement of the living standards of its citizens and strengthening its status in the international arena.*

Keywords: *Russian Federation, socio-economic development, small and medium entrepreneurship, business, society, state.*

Today, the socio-economic development of the Russian Federation determines not only the well-being and standard of living of the population of this state, but also its status in the transforming international system. Such influential organizations and associations of the modern world as BRICS and EAEU could not realize their full potential without the participation of Russia, which has a wide range of geopolitical resources and opportunities provided by them. In the same context, the challenges formed for the Russian economic system by the countries of the collective West create threats that have consequences not only for the Russian Federation, but also for the entire Eurasian region. The socio-economic development of Russia considered in this way is of extremely high importance and implies the participation of a wide range of socio-political institutions in its provision and growth.

It is obvious that in the modern state system not only state institutions, but also numerous socio-political organizations, including political parties, NGOs, ombudsmen, etc., are engaged in ensuring the development of the socio-economic sphere. At the same time, the role of such specific structures as business, in particular small and medium-sized enterprises (SME, SMB), remains undefined and insufficiently taken into account in the context of their performance of not only commercial, but also social functions. This makes the definition of the role of SMEs in the socioeconomic development of modern Russia an important research task and the purpose of this study.

In order to achieve it, it seems necessary to address such key tasks:

1. Determination of the regulatory framework and goals of socio-economic development of the Russian Federation;
2. Identification of statistical indicators of the development of the socio-economic sphere of the Russian Federation and the role of small and medium-sized businesses in it.

The object of the work was the trends of socio-economic development of Russia. Its subject was the role of small and medium-sized business institutions in the socio-economic development of the Russian Federation.

The methodological basis of the article was formed by a complex combining systemic and non-institutional approaches. The first of them allowed us to consider the activities to ensure socioeconomic development of Russia within the framework of a unified system of institutions. The second one made it possible to consider such non-political organizations as small and medium sized business institutions as new institutional formations with a complex of social and state responsibility.

The methodological basis of the article was formed by general scientific methods of analysis, synthesis, systematization, classification, as well as the analysis of normative documents and statistical indicators of the development of modern Russia.

The theoretical basis of the work was formed by the works of the classics of socio-political knowledge, who studied business institutions in the state system of the Russian Federation, as well as modern Russian researchers of socio-political interaction and social functions of small and medium-sized enterprises in the Russian system.

The solution of the first task of the article first of all implies the designation of the normative foundations for the development of socio-economic sphere of Russia. First of all, they are defined by such a strategic document of the Russian Federation as the “Decree on the national development goals of the Russian Federation for the period up to 2030 and in the perspective up to 2036” (Decree No. 309) [1]

It outlines national goals such as:

- “preserving the population, improving the health and well-being of people, supporting the family” [1];
- “comfortable and safe environment for living” [1];
- “sustainable and dynamic economy” [1];
- “technological leadership” [1]
- and a set of other development goals [1].

The set of these goals implies the development of the socio-economic sphere of Russia and improvement of their living standards. Also important is the understanding laid down in the document that the lack of work to achieve these goals contributes to the formation of challenges to socio-economic development in the Russian system.

These conclusions can be confirmed by theoretical studies of Russian authors, who in their works also highlighted the key challenges and directions of socio-economic development of the country. For example, O.V. Artemova and A.N. Savchenko in their study distinguish such socioeconomic spheres as social, economic and technological [2]. Obviously, the presented typologization fully generalizes the goals outlined in the Decree on the national development goals of the Russian Federation [1]. In addition, in his 2023 paper devoted to the study of trends in socioeconomic development of Russian regions, I.V. Likhman repeats the same list of socio-economic spheres, thus confirming the relevance of the presented division and its content capacity [3].

K.G. Soloviev offers a more detailed and broad vision of such classification in his work [4]. He identifies six problematic components of socio-economic development. In particular, such as:

- demographic
- the health of the nation;
- quality of life
- inequality and poverty;

- corruption;
- low level of culture [4].

Disagreeing with the author regarding the last two positions, it is worth noting that they go beyond socio-economic relations. The fifth position (corruption) reflects problems in the system of public administration, and the sixth (low level of culture) touches upon the cultural and moral development of the nation and every person in it. It is easy to trace the correlation between the remaining four problems and the national development goals defined in Decree No. 309 [1], which also cover the social and economic spheres

In addition, it is worth noting that all the authors whose classifications were presented in the article, the areas reflecting the key trends of socio-economic development are associated with negative processes in the Russian economy and social life of citizens. In particular, they are conditioned by the state of recession and insignificant economic growth, a decline in the standard of living of Russian citizens and insufficient social infrastructure, as well as associated with a significant lag of the Russian Federation in the field of innovation.

Most of these problems have their statistical measurement and have been studied not only by political scientists, but also by researchers of economic processes in the Russian Federation. For example, in his study devoted to the definition of scenarios of socio-economic development of the Russian Federation up to the years 2030-2035 indicated in the Decree No. 309 [1], A.G. Aganbegyan provides quantitative indicators corresponding to it [5]. A.G. Aganbegyan provides the corresponding quantitative indicators [5]. In particular, characterizing the sphere of economy, he identified three main stages in the process of its thirty-year development in the Russian Federation:

1. the transformation crisis of the 1990s - it implied a decline in all key indicators: GDP (by 1.8 p.), industrial production (by 2.2 p.), investment in fixed capital (by 4.8 p.) and personal income (by 1.9 p.);
2. recovery recovery before the crisis of 2008 - the indicators of this period, on the contrary, increased, which was primarily promoted by global trends (increase in oil prices, etc.): GDP (up 1.9 p.), industry (up 1.8 p.), investment (up 2.8 p.) and income (up 2.3 p.);
3. the period of crises and stagnation 2009-2020-ies assumes different indicators. By 2020 the GDP of the Russian Federation increased, but by less than 3%, investments did not increase, and income decreased [5, P. 231-236]. These processes were also based on domestic and international transformations, including the outflow of capital from the Russian Federation, the annexation of the Republic of Crimea and the reaction of the collective West to it, expressed in a set of sanctions, information pressure, etc. [5, P. 231-236].

The economic development of the current period can be briefly characterized as follows. According to the Ministry of Economic Development of the Russian Federation, GDP growth in 2024 amounted to 4.1%. Its nominal value has doubled over the past four years and amounted to 200 trillion rubles. The industrial production index also grew by 4.6%. Its basis was formed by the extractive industry. It is also important that the unemployment rate amounted to only 2.5%, and the growth rate of wages showed some growth [6]. In general characterizing the current economic situation the director of the Institute of National Economic Forecasting of the Russian Academy of Sciences A. Shirov noted that “in 2024 the trends of advanced development of industrial regions, accompanied by the growth of wages and incomes of the population were consolidated. During the year, the trends of slowing economic growth rates were gradually formed, while the outstripping growth rates of production in the defense sector were preserved. These trends will influence the development of the Russian economy in the first half of 2025 as well” [7].

In addition to the above indicators of unemployment and wages, the social development sphere is characterized by indicators of mortality, life expectancy and poverty. According to Rosstat data, in 2024 the natural population decline in the Russian Federation amounted to 596.2 thousand people. [8]. Combined with the hundredth positions of Russia in the world rankings in terms of life expectancy of citizens, 80-90th places in terms of poverty and 60-70th places in terms of social development in general [5, P.240], these data characterize a set of problems to be solved in the social sphere of the Russian Federation.

The last, technological sphere is also characterized by certain problems. About 80% of expenditures on it still fall on state structures. At the same time, R&D expenditures in 2024 amounted to 0.94% of the country's GDP and provided the RF with the 46th position in the world ranking [9]. This does not reduce the importance of the IT sphere in the country's GDP and its insignificant increase (by 0.3%) compared to 2023. [10], but it implies the need for further active work on the development of this socio-economic sphere as well.

It is obvious that the role of SME institutions in the development of socio-economic sphere is not limited only to economic issues. Its overall social significance was stated in the address to the Federal Assembly on February 29, 2024 by the President of the Russian Federation. In particular, in it V.V. Putin indicated that in 2023 the share of SMEs exceeded 20% in manufacturing, tourism and IT. As a result hundreds of new brands were created in Russia. At the same time, the President noted that all this was done “in the interests of the state, society and millions of people” [11], as Russian entrepreneurs “create jobs, provide jobs and salaries for people” [11]. [11].

The basis for such a high assessment of the role of SMEs in the socio-economic development of Russia is the understanding of their broad sphere of responsibility. For example, Russian researchers J.G. Golodova and P.A. Smirnov in their work prove that in the modern state system SME institutions are responsible to four categories of subjects: the state, society, contractors and employees [12]. The consonance of these categories with the subjects identified in the message of the President of the Russian Federation is obvious.

The objective ability of SMEs to fulfill their social obligations is confirmed by the data of the Federal Tax Service of the Russian Federation. According to them, at the time of March 10, 2025 in Russia there were more than 6.5 million small and medium-sized businesses, with a total number of more than 15 million employees. The most popular spheres of SME activity were such as retail trade by mail or Internet, activities of automobile cargo transportation, construction [13] and a number of others, providing today jobs for various categories of citizens, including people with disabilities, women in maternity leave and others.

Obviously, at this stage of state development, small and medium-sized business institutions in Russia, as well as others, have not only opportunities, but also problems that require stimulation and support. However, their social activities are already being realized now, contributing to the socio-economic development of the Russian Federation and helping to improve the living standards of its citizens and strengthen its status in the international arena.

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跨学科方法对新手语言学家教师专业能力掌握水平进行自我诊断的发展
**INTERDISCIPLINARY APPROACHES TO THE DEVELOPMENT
OF SELF-DIAGNOSIS OF THE LEVEL OF MASTERY OF
PROFESSIONAL COMPETENCE OF A NOVICE PHILOLOGIST
TEACHER**

Skafa Elena Ivanovna

*Doctor of Pedagogical Sciences, Professor, Head of Department
Donetsk State University,
Donetsk, Russia*

Kudreyko Irina Alexandrovna

*Candidate of Philological Sciences, Associate Professor, Director
Institute of Pedagogy,
Donetsk State University,
Donetsk, Russia*

注释. 培养现代教师（包括教师兼语文学家）的方法论之一是基于能力的教学法。该方法的实施有助于培养未来教师在教育技术化和数字化背景下开展专业活动的准备和能力。基于基于能力的教学法理念，本文介绍了顿涅茨克国立大学开发数字工具包的经验，该工具包旨在对新手教师兼语文学家的专业能力主要组成部分进行自我诊断，并根据诊断结果进行修正。

关键词：专业能力，新手教师兼语文学家，自我诊断，修正，数字工具。

Annotation. *One of the methodological approaches to training of a modern teacher, including a teacher-philologist, is a competence-based approach, the implementation of which forms the readiness and ability of a future teacher to perform professional activities in the context of technologization and digitalization of education. Based on the ideology of the competence-based approach, the article describes the experience of Donetsk State University in developing a digital toolkit aimed at self-diagnosis of the main components of professional competence of a novice teacher-philologist and correction of the results obtained.*

Keywords: *professional competence, beginning teacher-philologist, self-diagnosis, correction, digital tools.*

The process of professional training of future teachers of philology in higher education is built on the methodological basis of a competence-based approach to

teaching. Its use involves the development of students' competencies necessary for subsequent professional activities, taking into account the dynamically changing conditions of the surrounding reality and the transformation of education.

In scientific studies of the competence-based approach, the attention of many authors is focused on the features of development of professional competencies of teachers in the era of digitalization of education [4]. The importance of mastering the future teacher professional competence for effective and productive activities in school to organize high-quality education for students is considered in the work [1]. Various scientific approaches and models of their formation are being developed, one of which is a conceptual model for the formation of a system of professionally significant values of future teachers-philologists in the context of digitalization of education [2]. Received justification key competencies required for education for sustainable development of society and strategies for developing 21st century skills [9].

The professional competence of a teacher presupposes the readiness and ability to successfully carry out pedagogical activities, in the structure of which are distinguished subject, psychological, pedagogical, methodological, digital and reflective competences, allowing them adapt to the requirements of the given activity [6].

Thus, based on the ideology of the competence-based approach, we consider the professional competence of a philologist teacher as an integrative quality of the individual, uniting their readiness and ability to carry out educational and upbringing activities based on the formed competencies in the field of philological, psychological and pedagogical sciences and methodological skills.

One of the criteria characterizing the effectiveness of the formation of professional competence of a philologist teacher is the reflective criterion, the indicators of which are:

- the ability to self-diagnose, self-organize, self-express, self-develop, self-motivate;
- the ability to analyze one's own behavior and the effectiveness of one's work in the subject area of "Philology."

The tools for measuring the indicators of this criterion were the sets of test tasks contained in the multimedia simulator "Self-diagnosis of professionally significant values of a novice teacher-philologist", developed at Donetsk State University. This approach meets the current requirements for the development of digital tools for assessing the work of teachers, described in the work [13]. The implementation of this approach allows us to objectively assess the current level of training of a novice teacher, determine mechanisms for improving the existing education system, and adjust the results obtained.

The creation of materials for the development of self-diagnostics of the level of mastery of professional competence of a beginning teacher-philologist was carried

out on the basis of interdisciplinary integration. The developers were teachers of the philological faculty, reading disciplines of philological orientation and disciplines of the methodological cycle, departments of pedagogy, psychology, computer technologies of Donetsk State University.

Let us describe the technology for creating digital materials for organizing self-diagnosis of a novice philology teacher.

Pedagogical component of professional competence of a teacher-philologist (psychological, pedagogical and methodological competence) contains three blocks of tests:

- diagnostics of methodological competencies;
- diagnostics of knowledge of developmental and educational psychology;
- diagnostics of the level of proficiency in regulatory documents (federal state educational standards of basic and secondary general education).

The tasks update questions related to the psychological, pedagogical and methodological foundations of the activities of a philology teacher. The user is not only tested, but also has the opportunity to adjust their knowledge by receiving the results of the test, since each of the three blocks is presented in the Online Test Pad program. Information with a full analysis is immediately sent to the e-mail address of the test taker.

If the user wishes to adjust their results in the simulator, they can refer to the materials, describing the methodology of teaching philological subjects, where attention is drawn to the main tasks of teaching the subject area “Philology”, to the characteristic features of the selection of content, learning objectives, the choice of appropriate forms and methods of teaching in the context of technologization and digitalization of education [5;6].

Professional and philological competence of a novice teacher (subject) is tested on the subjects of the philological block, which were studied by future philology teachers in the bachelor’s degree.

The diagnostics of the philological competence of a philologist graduate is carried out in the form of a test developed in the Online Test Pad program. For one session, the user is offered a test of 30 questions on different disciplines (the task bank consists of 200 tasks). After completing all the tasks, the test subject receives the results by e-mail with an analysis of the wrong answers and highlighting the correct ones. If the test subject wants to take the test again, the program offers them other questions.

Digital competence of the teacher serves as a systematization of software in the subject area of “Philology”, divided into stationery and browser-based programs. Digital technologies, modern researchers of digital competence note, are considered as a tool for developing professionally significant values of a future teacher of philology [3]. Professional digital competence of newly qualified teachers is of great importance for teacher education, including teachers of philology [8;10;11].

For self-diagnosis we have selected two blocks of tests:

- computer literacy diagnostics;
- diagnostics of digital competencies.

The tests serve to self-test the user's computer literacy, as well as their digital competencies, using questions related to the use of software in the subject area of "Philology", proficiency in digital technologies, social networks and digital platforms for developing online lessons. Tests are created in the program Power Point based on the ideology of constructing heuristic-didactic structures [7], in which the user can refer to the hint when choosing an answer, and, if necessary, check the correctness of their answer. Such work is of a corrective nature.

All the above materials are collected in a multimedia simulator "Self-diagnosis of professionally significant values of a novice teacher-philologist" (Fig. 1).



Figure 1. The main page of the simulator

It included both diagnostic tests and corrective materials related to current information regarding the main characteristics of pedagogical activity, consideration of digital platforms for developing electronic lessons and justification of the choice of the preferred ones, description of various services for use at different stages of electronic lessons, features of the development of innovative forms of teaching schoolchildren, creation of educational projects and examples of their development, etc.

When developing the multimedia simulator, we used Autoplay Media Studio program. The materials included in the simulator are aimed at identifying the ability to self-organization, self-expression and self-motivation of a novice philology teacher.

Thus, the presented approach to the development of self-diagnosis of the level of mastery of professional competence of a beginning teacher-philologist allows an already working teacher to repeat and systematize knowledge, both in the subject area of “Philology”, and to generalize the necessary information in related sciences, necessary for fruitful professional activity in a modern school.

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克里米亚革命前的教育。费奥多西亚师范学院开办
**PRE-REVOLUTIONARY EDUCATION IN THE CRIMEA. THE
TEACHERS' INSTITUTE OPENING IN FEODOSIYA**

Sharlat Lidiya Petrovna

Candidate of Pedagogical Sciences, Lecturer

Private educational institution "Simferopol International School"

摘要. 本文探讨了在费奥多西亚市开设第一所师范高等院校的理论分析, 探讨了开设该院校的原因和目标。运用历史研究、教育学研究、历史回顾和回顾的方法, 在期刊综述和系统化的基础上, 研究了教育过程的结构组织; 明确了招生和学生构成规则; 揭示了费奥多西亚市教育机构的任务; 论证了教师培训对克里米亚和整个陶立特省学校工作的相关性, 其具有科学、人文、文化和教育意义。

关键词: 教师队伍、俄罗斯民族根源、虔诚、学生、市立学校、教学人员。

Abstract. *The article discusses a theoretical analysis of opening the first pedagogical higher educational institution in Feodosiya town; the causes and goals of the teacher's institute opening are investigated. Using historical, pedagogical, historical and retrospective methods, based on the generalization, systematization of periodicals, the organization of the structure of the educational process are studied; rules for admission and of students' members are identified; the tasks of the educational institution Feodosia are revealed; the relevance of teacher training for work in schools in the Crimea and the Tauride province as a whole is substantiated, which is of scientific, humanitarian, cultural and educational interest*

Keywords: *teachers' staff, Russian national roots, piety, students, municipal school, teaching staff.*

Currently, the issues related to pedagogical historiography are becoming particularly relevant. Pedagogical historiography allows, according to the fair comment of R.M. Ryabkov, 'to study the process of accumulation of factual knowledge, to introduce into scientific circulation previously unknown sources ..., which generally increases its importance and relevance in practice [11]. All mentioned above also applies to the history of the Institute. These problems became the subject of scientific research by E.V. Kostyleva [6, 7], S.A. Vishnevsky [1], E.V. Selimova [12], N.I. Lents [8], A. Klossovsky [5], E.V. Novikova [9]. However,

the issues related to the history of this educational institution opening are not highlighted or insufficiently covered.

The article, based on the application of the historical method, identifies scientific and theoretical aspects related to the formation of a model for training teachers using the example of the above-mentioned higher educational institution. So, in particular, the development of pedagogical education in the Tauride province since the 18th century contributes to the process of forming the educational environment in the Crimea, as in the multicultural region and the need to reform it in the above mentioned direction. The development of pedagogical education has been taking place in the southern multicultural region of the Russian Empire - Taurida province since the XIX century through the introduction of reforms in the 60s of the XIX century [p. 23], one of the main tasks of which was the involvement of Taurida province in the unified educational space of the Russian Empire through the establishment of government educational institutions and their dissemination of the Russian language among the local multinational population.

By the time the teacher's institute was opened in Crimea, a number of professional educational institutions training specialists for different sectors of the economy and culture had been founded. There were also various educational institutions that trained teachers. Educational institutions are opening in Crimea to train teachers for national and multinational schools of the province: Kerch Kushnikovsky Institute of Noble Maidens (1835), Tauride Women's Eparchial School (1866), Simferopol Tatar Teacher's School (1872), which trained teachers for Tatar schools. Tauride Theological Seminary (1873), which contributed to the organization of the primary education system [13, p. 177]. Seminary students received with the permission of the rector Archimandrite Arseny (A. Bryantsev) 'a special certificate for the right to teach' in private homes [4]. Preslav Bulgarian Teachers' Seminary (1875), pedagogical classes at women's gymnasiums and progymnasiums in the Crimea (70s of the XIX c.) [9]. Among them was The teacher's institute, opened in Feodosia on November 21, 1874 at the initiative of the trustee of the Odessa school district, Privy Councilor Sergei Platonovich Golubtsov was among them. It was the first institute in Feodosia and one of the first institutes in the Crimea, which was located in the three-story building of the former Khalibov Armenian School in the western part of Feodosia, near Lysaya Gora, which was closed for financial reasons.

The opening of the Feodosia Teachers' Institute in the Crimea was particularly ceremonial. The celebration began with a prayer service performed by the rector of the local cathedral church, John Paximade, accompanied by the institute's law teacher, candidate of theology, priest Fr Mikhail Gastev. The opening ceremony was attended by Mr. Trustee appointed for this celebration, District Trustee D.S.S. M.T. Pyatin, many honourable citizens, persons of the educational department

and future students of the Institute [10, p. 153]. Before the beginning of the prayer service, the Institute's teacher Fr. Gastev addressed the audience and noted that according to the Russian custom, every private, public, civil or national matter always begins with the blessing of God - prayer to God, an ancient Christian custom bequeathed by pious ancestors and deeply respected by Christians. Then the lawgiver made the following speech: 'We have gathered for the opening of the Teachers' Institute, the purpose of which is to educate and train Russian teachers for Russian city schools. The new phenomenon is highly gratifying, Then the lawgiver made the following speech: 'We have gathered for the opening of the Teachers' Institute, the purpose of which is to educate and train Russian teachers for Russian city schools. The new phenomenon is highly gratifying, - the cause is quite holy. The holy Russia says thousands of 'thank you' to the patron saint of domestic education [10, p. 154]. The teachers' institutes had high hopes for the training of students who, after graduation, would bring education to the multinational urban population, thus contributing to the formation of a multicultural educational space with respect for the customs and traditions, religious beliefs of the numerous peoples of the Crimean peninsula. Education of future teachers of the institute should take place in the spirit of Russian nationality and piety, as 'only such mentors people will be able to obey and trust in their re-education' [10, c.154]. In this regard, Russian piety should be the cornerstone of the Theodosia Teachers' Institute. Further, the teacher of the institute, Fr. Gastev noted that it is necessary to educate teachers from their own environment, who know the environment in which their students live, and then the students will successfully master science, trusting and imitating their teacher-mentor. Native Russian piety true Christian should form the basis of the teacher's institute. The district inspector stated that "on the basis of the opinion of the State Council, which was highly approved on May 31, 1872, it is necessary to establish seven teacher institutes to prepare teachers for city schools of provinces in cities that will be elected at the discretion of the Ministry of Education." [10, c. 153-154]. A great contribution to the opening of the teacher's institute was made by the Russian Doctor of Medicine and the Privy Counselor and Trustee of the Odessa Educational District Sergey Platonovich Golubtsov, who established in Feodosia, a teacher's institute due the permission of the city of the Minister of Education.

For the maintenance of the teacher's institute in Feodosia, for annual vacation 26,400 rubles, including 7500 r for the maintenance of 60 official pupils were transferred from the state treasury [10, p. 154]. Then M.T. Pyatin, addressing the audience, drew attention to the statistics of educational institutions in the district town of Feodosia, with a relatively very limited number of inhabitants, which had the following educational institutions: women's state gymnasium (1866), men's gymnasium (1873) and Khalibov Armenian school (1858), which in the nearest

future should be transformed into a city school on completely new grounds, more consistent with the general pedagogical principles and the actual needs of the urban population. All these educational institutions belonged to the category of secondary ones, so the teacher's institute is becoming a new living strong connection between Feodosia and other large or small district centers in our country, which will most favorably affect their development in the education of the population of the entire southern region of Russia [10, p. 155]. Besides, energetic and truly educated people of Feodosia are ready to devote themselves to scientific and educational activities with love and dedication, being members of the new pedagogical board of the Institute. Thus, the Theodosia Teachers' Institute is a completely new phenomenon in Russia, to which an appreciative generation owes the Minister of National Education Dmitry Andreyevich Tolstoy, who during his tenure as Minister increased almost threefold the number of secondary and higher educational institutions and more than 20 times the number of lower educational institutions. The Teachers' Institute of Feodosia. The Teachers' Institute of Theodosia has been a true lamp for all small nations, asserting their rights to human dignity on a par with the strongest of the world. District Inspector M.T. in his speech said: 'By the truly luminary we mean that light of the sciences, which enlightening and ennobling fortitude, directs them, firstly, to honest, noble and indefatigable work - this first expression of Christian freedom of man; secondly, to a highly moral life [10, p.156]. At the end of the celebration, many of those present signed the act of opening the teachers' institute. After the opening of the institution, entrance exams were held, the results of which we can see from the following table.

Table
The results of entrance exams in 1874

Coming	Received				
	From the 6th class of the gymnasium	From the 5th class of the gymnasium	From the 4th class of the gymnasium	From county schools	Total Received
19 p.	2 p.	1p.	3p.	6 p.	12 p.

As can be seen from the table, the majority of entrants had sufficient preparation. Only those who aged 16 could enter the institute. It should be noted that among the entrants, there were graduates from theological schools. When entering an educational institution, graduates of city schools who worked at school, as well as persons who graduated from gymnasiums, theological seminaries with positive characteristics about their morality were used by benefits.

It should be also emphasised that according to the secret instruction of the Ministry of Public Education, it was stated that it would be possible to admit to the Feodosiya "Teachers Institute" people of all Christian confessions, but Ro-

man Catholic, of Polish origin. Persons of non-Christian confessions could not be admitted to the teaching institutes [2, p. 4]. The children of officials, philistines, peasants, that is children from poor families, entered the institute.

At the teacher's institute, training lasted 3 years. In the first three classes, theoretical disciplines were studied. The fourth class of training was educational and practical. Students were supposed to undertake an internship at a two-class city school for pedagogical practice [3, p. 7].

Sergey Platonovich Golubtsov, the trustee of the Odessa educational district proposed to organise and head the educational institution to the Russian historian, State Councillor Mikhail Fedorovich Shugurov, known for his pedagogical experience, former inspector and teacher of the Odessa Institute of Noble Maidens, who in September 1974 started to arrange the new institution having previously visited Moscow, St. Petersburg and other cities in order to study the organisation educational institutions those ones. His main duty was to supervise the teaching, the order of the institute, the material arrangements, and the exact execution of all regulations. He also had the right to teach any subject of his choice that corresponded to his education, but not more than 6 hours a week [8, c. 39]. In addition, the director was obliged to submit an annual report to the trustee of the Odessa school district on the state of the institute in all parts, namely: a) general information about the educational institution, including information about the time of opening, premises, number of classes; b) quality of teachers' training and teaching; c) knowledge of students; d) moral character of teachers. The form of the report included statistical data on the state of the educational institution for the past year, summarised in several tables.

As for the teaching staff, it had not been complete yet by the opening of the teacher's institute and included only:

- the law-teacher, candidate of theology of the Moscow Theological Academy;
- the former teacher of church eloquence in Kamenets-Podolsk and Donskaya seminary, priest M. Gastev;
- the lecturer A.I. Sergeyev, a well-known compiler of geography textbooks, transferred from Berdyansk gymnasium;
- the lecturer N.P. Ilyin, former mentor and superintendent of zemstvo schools in Sapozhok town.

Later, the following lecturers supplemented the teaching staff:

- II. M. Kolybelin, the teacher of Russian language and literature;
- V. F. Dolgoplov, the teacher of natural sciences;
- K. I. Grosso, the teacher of maths;
- D. A. Markov, the teacher of astronomy and history;
- the artist Lipkin, the teacher of drawing.

Students studied for free and received a scholarship in the amount of 14 rubles. Graduates of the institute received certificates for the title of the city school teacher and were obliged to work as a teacher of the city school by appointment of the educational authorities for at least six years. At the Teachers' Institute, there were one-year courses for accelerated training of teachers of primary schools. Teachers wishing to take these courses were provided with a one-time allowance of 100 rubles with salary preservation.

Thus, the opening of the Feodosia Teachers' Institute, based on Christian principles, was progressive and met the urgent needs of the time and took place within the socio-economic, political development of the Crimean peninsula and the Russian Empire as a whole. In the XIX century, the institute training of teachers acquires special significance, in the context of the development of education as a whole, which further determined the cultural code of our state at the present stage. It is pedagogical education that has always been and remains the key link on which the solution to many problems in the education system of the Russian state depends.

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智能教育时代的教育学转型：人工智能技术的机遇与挑战
**THE TRANSFORMATION OF PEDAGOGY IN THE ERA
OF INTELLIGENT EDUCATION: OPPORTUNITIES AND
CHALLENGES OF ARTIFICIAL INTELLIGENCE TECHNOLOGY**

Wan Yu Yang

Postgraduate Student

Belarussian National Technical University, Minsk, Belarus

摘要.人工智能(AI)发展极为迅速,教育的未来正在自我重塑。本文探讨了当前人工智能技术在教育领域的多种适配应用,分析了其在教学法重塑方面带来的机遇与挑战,并构思了相应的应对方法。文章指出,人工智能不仅为教育中的个性化学习、智能教学和精准评价提供了新的工具,还带来了相应的新教育理念、教育模式以及教师角色的转变。然而,数据隐私、技术适应性以及教师的专业发展等重要问题也必须得到解决。为了让教育学领域的研究人员和从业者能够积极地利用人工智能,本文鼓励他们以最先进的方式投身于适应智能时代的教学实践中。

关键词:人工智能; 教学法; 个性化学习; 智能教学; 教育评价; 教育变革

Abstract. Artificial Intelligence (AI) has been developing so rapidly that the future of education is restructuring itself. Using this paper, the current compatible variety of AI technology in the field of education is explored, the opportunities and challenges it provides towards the remodelling of pedagogy are analysed, and the methods of response are conceptualized. It says AI not only gives new tools to personalized learning, intelligent teaching and precise evaluation in education, but also brings about the corresponding new education concept, education model and teachers' role. Nevertheless, important matters like data privacy, technological adaptability and professional development for teachers have to be addressed. To engage AI enthusiastically as researchers and practitioners in pedagogy, the paper encourages them to engage in pedagogy responding to the intelligent era in the most progressive way.

Keywords: Artificial Intelligence; Pedagogy; Personalized Learning; Intelligent Teaching; Educational Evaluation; Educational Transformation.

I. Introduction

By today's standard of fast development across intelligent technologies, artificial intelligence (AI) is a force for change that moves across all industries. Along

the same lines, AI technologies are causing deep modifications in educational models and in research in pedagogy. Given that pedagogy is a discipline, which studies educational phenomena and lays down the foundations of the laws of education, pedagogy should actively react to the opportunities and challenges associated with the use of AI, try to create new educational models and teaching methods, and adapt to the requirements of society of the future for the education. The main objective of this paper is to focus the applications of AI technology in education today, and to scrutinise the effect of the AI technology on the pedagogical transformation, and present suitable measures in response.

II. Opportunities for the Transformation of Pedagogy Brought by AI

A. Renewal of Educational Concepts

The application of AI technology has brought the change from the traditional ‘teacher centered’ approach to the ‘student centered’ approach. Personalized learning and intelligent teaching aids are emerging nowadays to highlight individual differences and personalized requirements in education, paying attention to students’ autonomous learning and innovation competence. This change in educational concepts will lead to pedagogical research to concentrate more on students’ learning experience outcome, which will facilitate Innovation in the new educational models.

B. Innovation in Teaching Models

A technology support for the modelling of teaching innovation is provided by AI. For instance, AI blended with virtual reality (VR) and augmented reality (AR) technologies will aid in the development of immersive learning spaces for the students which would enhance learning experiences. Intelligent teaching system can, in addition, dynamically adjust teaching content and methods according to the students learning process and feedback, so that intelligent and personalized teaching process is achieved. These newly developed teaching models will enhance the teaching outcome and promote students’ comprehensive development. University education models are undergoing transformation. Traditional teaching models are being disrupted by AI. Universities have established their own AI platforms, allowing faculty members to create customized chatbots and other AI tools to support their research, teaching, and other activities on campus.

C. Transformation of the Teacher’s Role

A profound transformation of the teacher’s role is taking place as AI is being commonly used in education. In order for teachers to effectively employ intelligent tools in their teaching activities, they necessarily would be in possession of good information technology literacy to have the capability of employing AI applications. In addition, they should be versed with the data analysis and interpretation skills so that they may interpret the data supplied by AI to enhance teaching decision making process. The new teacher’s role would bring teacher professional

development and better level of teaching. In addition, they should also master data analysis and interpretation skills so that they can interpret the data provided by artificial intelligence, thereby enhancing the decision-making process in teaching. The new role of teachers will bring professional development and better teaching standards. For university teachers, they need to constantly update their knowledge system and master the latest artificial intelligence technology to adapt to the rapid development of the education field.

III. Challenges for the Transformation of Pedagogy Brought by AI

A. Technological Adaptability Issues

At the same time, it is still a problem of technological adaptability in actual application of AI technology in the field of education. The need for AI technology in different educational scenes and different teaching requirements is different. There is a need for further exploration and practice in how AI technology can be combined with particular educational practices that facilitate more effective provision of educational goals. Let's use it as an example — some remote areas and their schools that have limited resources on their hardware and network for the AI technology to work may not have AI applied so much in education.

B. Data Privacy and Security Issues

The prerequisite for the application of AI technology is large amounts of data gathered, containing students' personal information and learning data. It is a pressing issue to solve, however, how to do data privacy and security while also processing data collection, storage, and use, as well as prevent data leakage and misuse when introducing AI and pedagogy. When students' data are leaked, there is a great risk that the data will have serious impacts on personal development and privacy. For this reason, mechanisms and security management systems for protecting data privacy must be established and improved to ensure that data is managed and supervised.

C. Challenges in Teacher Professional Development

The adoption of AI in education will have a major impact on the transformation of the teacher's role. In addition to having good information technology literacy and AI application abilities, teachers ought to hold data analysis and interpretation skills in order to better use the data produced by AI in making teaching decisions. However, it is a fact that a significant number of teachers now do not have these capacities and require to improve on their professional training and development to meet challenges of educational changes in the AI time.

IV. Strategies and Suggestions for Response

A. Strengthening Technology Development and Adaptation

For the development of AI technology suitable to the learning and education scenarios, educational institutions and technology companies should further strengthen cooperation to develop jointly the technology capable of better adapt-

ability and utilization effectiveness. Meanwhile, more investment in remote areas and remote schools with scarce resources must be spent to upgrade their hardware and network conditions, narrow AI technology application in education space gap and empower more students in enjoying AI technology.

B. Improving Data Privacy Protection Mechanisms

It is to establish and improve data privacy protection mechanisms and security management systems, and increase data privacy protection and security management to strengthen the management and supervision of student data. To make the process legal, data storage, collection, and use should strictly comply with relevant laws and regulations in educational institutions. While they should be at the same time improving the protection of data privacy education for teachers and students, also increasing the awareness of data security for teachers and students, preventing the leakage and misuse of the data.

C. Promoting Teacher Professional Development

Strengthen teacher professional training and development to enhance teachers' information technology literacy and AI application capabilities. Educational institutions should regularly organize teachers to participate in relevant training courses, provide practical opportunities and communication platforms, and help teachers master the application methods and teaching strategies of AI technology. At the same time, teachers should be encouraged to conduct relevant research to explore innovative applications of AI technology in teaching and learning, promoting teacher professional development.

V. Conclusion

With unprecedented opportunities for the transformation of pedagogy lie many challenges in employing AI technology. To this end, researchers and practitioners are encouraged to envision and pursue the infusion of innovative AI applications into education, and embrace the profound change of educational concepts, models of teaching, and a new role of the teachers. Strengthening the development and adaptation of technology, enhancing privacy protection mechanism for data, and cultivating teachers' professionalism can effectively overcome the problems from AI, and develop pedagogy in the intelligent era, and provide strong backing to cultivate the talents in the future society that match the requirements.

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在俄语课上利用VR技术向外国学生介绍俄罗斯艺术。关于元宇宙作为教育资源的
展望

**INTRODUCING RUSSIAN ART TO FOREIGN STUDENTS DURING
RUSSIAN LANGUAGE CLASSES USING VR TECHNOLOGIES.
PERSPECTIVES ON THE METAVERSE AS EDUCATIONAL
RESOURCE**

Kuzubova Sofia Yuryevna

Postgraduate

Belgorod State University

摘要.文化是个人语言技能发展过程中不可或缺的一部分。特别关注的是以所学语言所在国文化为基础的交际能力的形成。在社会文化研究方法的背景下, 如果无法接触俄罗斯艺术作品, 则有机会使用虚拟现实技术。本文旨在研究利用沉浸式虚拟现实进行的教育过程的具体内容, 并找出哪些平台和资源可以成为元宇宙的一部分。本文以提供俄罗斯著名历史遗迹在线导览的网站 Culture.ru 和关于教育过程组织细节的方法论文献为素材。本文采用了以下方法: 分析关于远程和混合式教育过程教学问题的科学和方法论文献, 以系统化理论材料; 描述性方法, 以发现元宇宙的优缺点; 概括教学经验, 以进行方法论分析; 并利用VR技术设计俄罗斯文化主题的课程。研究结果表明, 目前已有基础将俄罗斯文化信息融入可能的元宇宙。本文探讨了沉浸式虚拟现实的优缺点, 并提出了在元宇宙中开展工作以及将以VR文化为导向的俄语课程纳入教育计划的方案。

总而言之, 作者强调了人工智能技术在元宇宙中的潜在发展, 以及研究新技术在俄语作为第二语言教学中对学生心理健康影响的重要性。

关键词: 元宇宙; 俄语作为第二语言; 艺术; VR; 教育技术; 远程学习。

Abstract. Culture is an integral part of a person's language skill-development process. Special consideration is focused on the formation of communicative competence based on the basics of the culture of the country, the language of which is being studied. In the context of a sociocultural approach, in cases of inaccessibility to Russian works of art, there is a chance to use VR technologies. The aim of this article is to study the specifics of the educational process that is carried out with the use of immersive virtual reality and to find out which platforms and resources are ready to become part of the Metaverse. Website Culture.ru, which provides an online-tour of famous historical places in Russia and methodological literature on the topic of specifics of organization of educational process, serve as materials for this article. The following methods are being applied: method

of analyzing scientific and methodological literature on the issue of pedagogical problems of distant and blended forms of educational process for systematization of theoretical material; descriptive method for discovering pros and cons of the Metaverse; generalization of pedagogical experience for methodological analyses; and designing lessons on the topic of Russian culture with the help of VR technologies. In the result of the study, the author highlights that nowadays there is a basis for the incorporation of Russian cultural information into the possible Metaverse. The pros and cons of immersive virtual reality are discovered, and the plan of working inside the Metaverse and VR culturally oriented Russian language lessons included in the educational program is suggested.

In conclusion, the author highlights the possible evolution of Metaverse with the usage of artificial intelligence and the importance of researching the new technologies' influence on the psychological and mental health of the students during Russian as a second language lesson.

Keywords: *Metaverse; Russian as the second language; Arts; VR; Educational technologies; Distant learning.*

Introduction.

Russian painting, sculpture, architecture and music are an integral part of classes in both Russian as a foreign language (hereinafter RFL) and Russian as a native language (hereinafter RNL). The main advantage of using painting in Russian language lessons is the presence of visual images for developing communicative competence. In classes devoted to Russian painting, students are introduced to famous paintings by Russian artists, their history and the features of a particular canvas. Students are asked to look at a painting, describe it, and talk about the feelings that this work of art can evoke. Visual aids are also inherent in sculpture and architecture. Sculptures (or their images) are used in RFL classes to practice various topics, including the topic of “Human Emotions”. Architectural monuments are fragments of history that help create a “complete image of an era”, evaluate and compare the architectural styles of Russia in different periods of time. Music and songs help improve listening and pronunciation skills.

Main part

Studying elements of Russian art is an extremely important part of the process of learning Russian as a foreign language, but, unfortunately, students may not have direct “access” to the original paintings, sculptures, and architecture. In this case, virtual and augmented reality technologies come to the aid of methodologists and teachers. Such technologies include not only various programs designed for remote communication (Skype, Zoom), but also technologies for partial or full immersion in the required linguistic or non-linguistic environment. For example,

in China, there are 360° live broadcasts that allow you to “supplement” reality, immerse yourself in virtual space using a mobile phone (FIGURES 1, 2, 3.).



Figure 1.



Figure 2



Figure 3

(Application 抖音, user live broadcast in the past, from 9.12.2023)

By rotating the device, the user can notice that the image changes in the same way as when turning the head or body in life. Such technologies can also be applied in the educational process. E.G. Azimov and V.A. Zhiltsov in their article “Using Virtual World Technologies in Distance Learning” consider existing technologies for creating “multiplayer three-dimensional spaces, the presence in which is not subordinated to any given goal” (Azimov, 2016: 111). From the point of view of the authors, “the development of an independent module of a virtual simulator of a real communicative environment is promising” (ibid.). Simulators (especially the considered TAKOS - a simulator organized on the principle of a three-dimensional active-communicative educational environment) really help to partially immerse oneself in the necessary communicative situation and provide free access to the necessary language content at any time convenient for the student.

The coronavirus era has brought certain changes to the life of every person. It can be said that this era has only brought closer and stimulated the development of virtual reality. In isolation, people needed access to those elements of their lives that became unavailable, but still remained desirable. Since March 2019, online tours of exhibitions began to appear on the YouTube platform, for example, on March 26, the YouTube channel of the Scuderie del Quirinale museum published an online tour of the exhibition “Raphael. 1350-1483”. Today, virtual tours of museums allow you to see masterpieces of Russian and foreign art from anywhere in the world. On the Kultura. RF website, students can enjoy the architectural ensembles of Russia at any time (FIGURE 4).

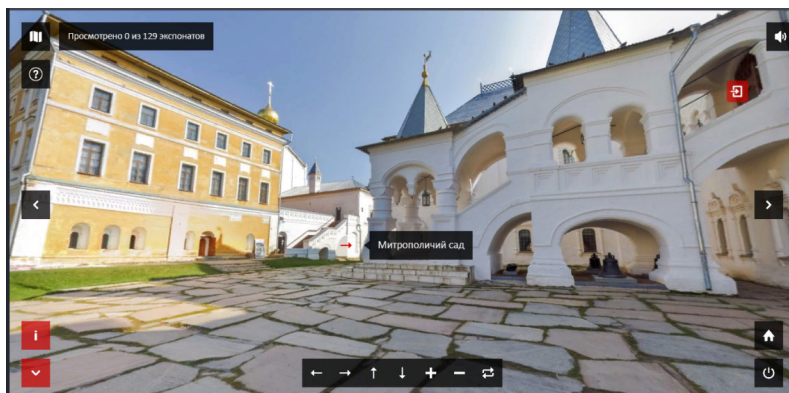


Figure 4. Internet resource Culture. R.F. (date of access 12/9/2023)

The creation of modern simulators of educational situations, online excursions are all steps towards the creation of the Metaverse, a space created from virtual worlds that are interconnected by servers and networks (Vladarsky, 2022: 273). The term “Metaverse” was first used by Neil Stephenson in the novel “The Snow Crash”, in which people interacted through their digital avatars inside a three-dimensional virtual world. A developed Metaverse is an opportunity for self-education and the application of acquired knowledge in situations that are as close to reality as possible. Immersive virtual reality will make communication more accessible and “painless” for the student, since in both educational and extracurricular situations, the anonymity of the object is maintained in the Metaverse, which in turn will ensure equality and equity of users, as well as the removal of the psychological barrier at the beginning of communication. The metaverse is a unique resource for bilingual development; foreign language classes can alternate with native language classes, or virtual reality can act as a special means of teaching a specific foreign language (in our case, Russian) outside the language environment.

The study of Russian art within the Metaverse can be carried out on the basis of virtual space modules or on the basis of an educational simulator. In the future, it is possible to connect online excursions with the Metaverse systems. This will allow the student to be present in an art gallery, on the street next to the necessary architectural structure or at a concert of symphonic or modern music. Immersive virtual reality is an open world in which it is possible to create an interactive educational module or freely move around cultural places.

This approach to teaching is a possible implementation of the socio-cultural approach, the concept of communicative foreign language education by E.I. Passov, since in this case there is a movement “from the facts of culture to the facts of language”, and the goal of the educational process is the culture of the country of

the studied language in all its manifestations. Due to the fact that the development of the methodology of work in RKI lessons using the Metaverse is based on such methodological principles as the principle of clarity, accessibility, durability, intercultural interaction, motivation, and situational-thematic organization of educational material, training can take place at any level of language proficiency. Work inside the immersive virtual reality can be group or individual, but the number of users using the training module simultaneously is unlimited.

Immersion in the Metaverse will be possible with the help of glasses or a virtual reality helmet, which are no longer something new and unfamiliar to many. These technologies are also widely used in art. For example, in St. Petersburg you can already visit the Gallery of Virtual Art, in the Marble Gallery of which there are three-dimensional reproductions of world masterpieces of art. Thus, virtual immersion in fine art is not a novelty, but a stage of technological development that humanity has already passed. By combining modern technologies, virtual galleries and cultural spaces in the Metaverse, the process of foreign language communicative education will receive a new development, and the level of awareness and interest of foreign students in Russian art and, as a result, in the study of the Russian language will increase.

When planning a lesson on Russian as a foreign language using the Metaverse, it is worth paying attention to the fact that in the conditions of a large number of paintings, architectural monuments and musical accompaniment, it is necessary not to forget about the communicative component. When working with painting, you can also ask students to describe the picture, show the direction of the brushstrokes, describe the color palette and frame. Sculpture will help students practice vocabulary related to the topic of “Materials”, “Human Emotions”, “Body Parts”, etc. By examining historical buildings, you can study vocabulary related to architectural styles and eras. Musical works will help work out vocabulary related to musical genres, the topic of “Musical Instruments”, etc. Generalizing the topic of “Art”, you can consolidate the use of adjectives, names of professions, facts and phenomena of the history of Russia and your native country. This form of work organization is suitable not only for students of art institutes, but also for students of other specialties, and being in virtual reality contributes to the effective acquisition of knowledge and will increase students’ motivation.

An approximate lesson plan for Russian as a foreign language, dedicated to the culture of Russia, using the Metaverse. An example of virtual work with the painting by I.E. Repin “The Ceremonial Session of the State Council on May 7, 1901, on the Day of the Centennial of its Establishment” (State Russian Museum):

1. Immersion stage and network stability testing.

2. Familiarization or repetition of the basic capabilities of the avatar on the network.

3. Connecting students to the support network or to the scanning system of codes with information about the canvases.
4. Free movement of students around the gallery.
5. Group meeting at I.E. Repin's painting "The ceremonial meeting of the State Council on May 7, 1901, on the day of the centenary of its establishment."
6. Historical background (year the painting was written and a brief history of the canvas).
7. Examination and description of the canvas, and later examination and description of individual sketches (portraits of government officials). Description of the scale of the paintings, colors, faces, emotions. Details of the costume and interior.
8. Performing exercises (find the sketches presented in the museum on the virtual copy of the painting; find the differences (the teacher first uploads a modified image of the painting to the platform); answer questions such as "How many statesmen are in the painting? How many sketches are presented?" etc.).
9. Discussion of results and summing up.
10. Exit from virtual reality.

Advantages The uses of the Metaverse in the educational process are:

1. Accessibility of the educational process at anytime from anywhere in the world.
2. Anonymity and equality online.
3. Partial or complete removal of the psychological barrier at the beginning of communication.
4. The existence of platforms and spaces that are potentially ready to become part of an immersive virtual environment.
5. Increasing the mobility, motivation, readiness for integration and involvement of students in the educational process.

Disadvantages The uses of the Metaverse in the educational process are:

1. Temporal limitations of the virtual environment at the initial stage of its formation.
2. The absence of a system of working with students that is methodically adapted to the requirements of the Metaverse.
3. Low availability of technical means necessary for immersion in virtual reality (and, as a consequence, inaccessibility and lack of inclusive education).
4. Possibility of developing dependence on the virtual environment.
5. In the Metaverse, a student enters a "processed" world in which situational communication between users is implied, but practically excluded.
6. The experience gained in the Metaverse cannot be identical to real life experience.

Conclusion.

Thus, we come to the following conclusions. The study of Russian culture plays a huge role not only in the formation of communicative competence in RKI classes, but also in the formation of an aesthetically developed personality. The Metaverse as a means of teaching and a platform for the development of educational technologies and methods has enormous potential, which has yet to be revealed during direct Russian language classes. At the same time, it is necessary to take into account the negative impact of virtual reality on the process of learning and the formation of a comprehensively developed individual, his language culture and the acquisition of a foreign language (in our case, the Russian language). As prospects for further research of the stated problems, we can name an in-depth study of the psychological perception of students of elements of Russian art that contribute to increasing motivation and the level of proficiency in RKI, through virtual reality, as well as with the help of artificial intelligence technologies.

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俄罗斯联邦和中国高校未来音乐教师历史和教育能力形成的比较分析
**COMPARATIVE ANALYSIS OF THE FORMATION OF THE
HISTORICAL AND PEDAGOGICAL COMPETENCE OF
FUTURE MUSIC TEACHERS IN UNIVERSITIES OF THE RUSSIAN
FEDERATION AND CHINA**

Li Yiting

Student

Institute of Fine Arts, Moscow State Pedagogical University

注释：本文致力于比较考察俄罗斯联邦和中华人民共和国音乐教师在未来音乐教师历史和教学能力培养方面的方法。作者认为，该问题的现实意义在于，教育界认识到在专业音乐教育师资培训领域开展比较研究的需求，但俄罗斯和中国音乐学院学生在掌握音乐教育史内容的各科和教学单元方面的方法和预期成果却缺乏比较分析。在识别共性和特殊性的基础上，本文提出了一个基于技术和内容机制、时间顺序、抽象逻辑和问题类型学方法以及教育、认知和预测功能的中国学生历史和教学能力培养过程的现代化模式。

关键词：音乐教师专业培训，音乐教育史作为一门科学，比较研究，历史和教学能力培养的主导机制、方法和功能。

Annotation. *The article is devoted to the comparative consideration of approaches of music teachers of the Russian Federation and the People's Republic of China to the formation of historical and pedagogical competence of future music teachers. The author justifies the relevance of the stated problem by the contradiction between the recognition by the pedagogical community of the demand for comparative research in the field of professional music- pedagogical teacher training and the lack of comparative analysis of approaches and planned results of mastering by students of music faculties of sections and didactic units of the content of the history of music education in Russia and China. Based on the identification of the common and special, the article proposes a model of modernization of the process of formation of historical and pedagogical competence of Chinese students, based on technological and content mechanisms; chronological, abstract-logical, problem-typological methods; educational, cognitive, predictive functions.*

Keywords: *professional training of music teacher, history of music education as a science, comparative studies, leading mechanisms, methods and functions of formation of historical and pedagogical competence.*

Relevance. Formation of historical and pedagogical competence is an important task of professional training of a music teacher both in Russia and China. Meanwhile, this science in the Russian Federation is currently an independent field of knowledge. In the PRC, it is considered in an applied sense, being a component of the methodology of music education. Such a vision of the phenomenon in question by Chinese and Russian music educators has led to the specificity of Russian and Chinese curricula. However, the formation of historical and pedagogical competence of future music teachers of these countries implies not only characteristic features, but also common regularities. This fact has caused the emergence of **a contradiction** between the recognition by the pedagogical community of the demand for comparative research in the field of professional music-pedagogical teacher training and the lack of a comparative analysis of approaches and planned results of mastering by music students of sections and didactic units of the content of the history of music education in Russia and China.

Research problem: common and characteristic features of formation of historical and pedagogical competence of future music teachers in Russia and China.

Object of the study: the process of music-pedagogical training of the music teacher.

Subject: comparative analysis of models of formation of historical and pedagogical competence of future music teachers in higher education institutions of the Russian Federation and the PRC.

The study is based on the **hypothesis** that:

- pedagogy of music education of the PRC of the XXI century allows us to consider the history of music education as an independent field of knowledge of professional training of a music teacher. The adoption of such a decision will strengthen the importance in the professional consciousness of a music teacher of historical and pedagogical activities aimed at comprehending the achievements of today in the teaching, education and development of children through musical art in the context of historical parallels and paradigms objectively existing in the country since ancient China;
- The large-scale experience of activity of higher educational institutions of the Russian Federation, which allows us to confidently declare the legitimacy of creating in the XXI century a scientific direction of the history of music education, can be extrapolated to the activity of pedagogical universities and institutes of China due to general regularities, and in particular, the obvious dynamics of the growth of interest of the pedagogical community, both in Russia and China, to the problems of the history of music education;

- The possibility of extrapolation of approaches of formation of historical and pedagogical competence of future music teachers of the Russian Federation in the practice of training music teachers of the PRC implies the formation of students' readiness to apply;
- *leading mechanisms: technological* (chronological mastering of the main historical
- stages of music education in the country and the leading musical and pedagogical concepts of Chinese authors from Ancient China to the present day) and *content levels* (based on the awareness of the identity of Chinese musical culture and educational philosophy);
- *leading methods: chronological* (realizing the stages of musical education of the country in their sequence), *abstract-logical* (consideration of musical-pedagogical concepts from the point of view of evidence), *problem-typological* (mastering the material in the context of cause-and-effect relations and essential features);
- *leading functions of the history of music education: educational* (allowing to form the worldview of the music teacher in the context of the formation of respect for the history of music education pedagogy); *cognitive* (contributing to the acquisition of historical and pedagogical knowledge in the field of music education); *prognostic* (initiating the possibility of anticipating the future in the field of music education on the basis of analyzing the historical experience of the past).

Scientific Novelty:

- by the method of comparative analysis of studies of Chinese [1, 2, 3] and Russian teachers [4, 5] revealed the peculiarities of methodological approaches characteristic for the future music teachers' mastering of the history of music education in Russian and Chinese universities;
- The features of the process of formation of historical and pedagogical competence of future music teachers of the Russian Federation were analyzed;
- The peculiarities of the process of formation of historical and pedagogical competence of future PRC music teachers were revealed;
- the model of extrapolation of approaches to the formation of historical and pedagogical competence of future music teachers of the Russian Federation in the practice of training music teachers of the PRC was developed and experimentally tested (Fig. 1).



Figure 1. Model of extrapolation of approaches of formation of historical and pedagogical competence of future music teachers of the Russian Federation to the practice of training music teachers of the PRC

Theoretical significance of the research consists in the fact that the thesis summarizes the conceptual provisions of educational philosophy, cultural studies, theory and methods of music education, determining the leading approaches to the formation of historical and pedagogical competence of future music teachers of the PRC and the Russian Federation application of a number of leading mechanisms, methods and functions.

The practical significance of the study lies in the fact that its results contribute to the optimization of the process of music-pedagogical education. The materials of the study can be used in lectures, seminars, workshops of the academic discipline “International cooperation in the sphere of musical culture and education”.

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启发式教学法在大学英语教学中的应用

THE USE OF HEURISTIC APPROACH IN TEACHING ENGLISH TO ESL UNIVERSITY STUDENTS

Malysheva Sofia Andreevna

Lecturer

*Moscow State Institute of International Relations (University)
of the MFA of Russia*

摘要: 启发式语言教学法强调基于发现的学习、问题解决和批判性思维,而非传统的死记硬背。这种方法能够加深英语作为第二语言(ESL)学生的语言理解,增强认知参与度,并促进自主学习。本文探讨了启发式教学的理论基础、课堂实践应用、优势、挑战以及在 ESL 教育中实施该方法的最佳实践。

关键词: 启发式方法、ESL 教学方法、启发式学习、ESL 大学生。

Abstract. *The heuristic approach in language teaching emphasizes discovery-based learning, problem-solving and critical thinking rather than traditional rote memorization. This method fosters deeper linguistic understanding in English as a Second Language (ESL) students, enhances cognitive engagement and promotes autonomous learning. This paper explores the theoretical foundations of heuristic teaching, practical classroom applications, benefits, challenges and best practices for implementing this approach in ESL education.*

Keywords: *heuristic approach, ESL teaching methods, heuristic learning, ESL university students.*

Heuristic learning which in its genesis dates back to Socrates' dialogues was considered by didacticians as a special case of problem-based learning for a long time. The term "heuristics" comes from the Greek "heuresko" – "to look for, to open" [5]. Heuristic learning took shape as an independent type of learning only in the 1990s thanks to the research conducted by A.V. Khutorsky and his scientific school who defined heuristic learning as the one that aims at the student's creation of his or her own meaning, goals and content of education as well as the process of its organization, diagnostics and awareness [3].

The theoretical basis of heuristics formation proved the necessity of applying heuristic methods in practice, which required scientists, teachers and psychologists to take certain measures to solve this scientific problem, which is still in-

sufficiently developed. Thus, heuristics has a rich centuries-old history, during which there was a gradual development of heuristics as a science of creating a new methodology of heuristic activity [1]. Knowledge of the history of heuristics assists in realizing and understanding modern problems and reasons behind insufficient implementation of heuristic methods and in finding conditions and ways to solve this problem.

The heuristic approach is rooted in constructivist learning theory, where students actively gain knowledge through exploration and inquiry. Its key principles include learner-centered instruction, problem-solving orientation, inductive learning and experimental learning. Learner-centered instruction encourages students to take an active role in discovering language rules. As for problem-solving orientation, the tasks are designed to stimulate analytical thinking. Thanks to the principle of inductive learning, grammar and vocabulary are inferred from context rather than explicitly taught. Experiential learning enables students to acquire language through real-world communication tasks.

The comparison between heuristic approach and traditional approach reveals four major aspects that differ: role of teacher, student role, error handling and assessment. In heuristic approach the main role of the teacher is to act as a facilitator and guide rather than an authority and knowledge transmitter. Students turn into active explorers and are no longer passive recipients. Errors are regarded as learning opportunities and are not corrected immediately. Assessment is reflective and process-oriented rather than exam-based and product-oriented.

Examining practical applications of heuristic approach in ESL classrooms, the author points out the following ones:

- project-based learning: students work on extended tasks (e.g., creating a podcast, conducting interviews) where they must research, collaborate, and present in English;
- guided-discovery learning: instead of teaching rules directly, students analyze example sentences to deduce patterns (e.g., identifying future tense forms from a text); as for contextual vocabulary acquisition, learners infer word meanings from reading passages or multimedia content;
- problem-based language tasks: students solve real-life communication problems (e.g., writing a complaint email based on a given scenario), complete language puzzles (crosswords, word association games, and syntax reconstruction exercises);
- Socratic questioning techniques: teachers use open-ended questions to guide students toward self-discovery (e.g., “Why do you think the verb changes in this sentence?”, “What pattern do you notice in these phrasal verbs?”).

One of the methods actively used at universities when teaching English to ESL students is the discussion of case studies. According to T. I. Khoroshilova,

a case is a situation that took place in practice and contains a problem that needs to be solved [2]. Consequently, a practical situation that can potentially arise and that needs to be discussed with an aim to find a reasonable solution is brought into the learning process. A case can be presented in any form (printed, audio, video, multimedia). The case method implies mainly pair or group work. According to N.V. Pokrovskaya, each interactive lesson using the method in question should be based on general didactic principles of teaching [4]. Working with case studies requires a sufficient level of language training of students, because cases are directly related to their future professional activity. Case study is combined with other heuristic means, for instance, brainstorming.

The methodological basis of the research was formed by the provisions of systemic, competence-based and personality-oriented approaches. The author applied theoretical and practical methods of pedagogical research. At the empirical level, the included observation and analysis were applied in order to reveal the effectiveness of the use of the case study method; at the theoretical level, a systematic analysis was performed. The study involved 33 third-year students of the faculty of international economic relations of the Moscow State Institute of International relations (University) of the MFA of Russia. The participants studied English as their second language and were involved in the implementation of the case study method in the process of studying commercial correspondence in English for two semesters. It should be noted that they had been studying for two years without the use of the case study method. A textbook on commercial correspondence was chosen for the case study.

The following positive results were obtained as a result of working with cases. Before the start of case study work only 30% of students, having familiarized themselves with the objectives of the upcoming work, showed interest (the main evidence - the increased number of references) and started to actively discuss, comment and perform all the tasks of the case. At the same time, students regularly asked for help from the instructor to correctly formulate sentences, clarify the correct translation into Russian. Gradually, with regular use of the case study method, students (82%) practically did not ask their lecturer for help, understood the description and tasks of the case independently, enthusiastically and almost error-free performed all case tasks (the number of errors decreased by 44%). Some students (23%) were able to read and translate all the parts of the case content at the very beginning of their work, but noted difficulties in writing and orally commenting on the decision made, sometimes even in Russian.

In the course of the included observation it was discovered that there were two main reasons for such reaction of the students: psychological fear of failing to cope with this type of task due to its novelty and language difficulties. Students who experienced some extent of confusion were asked to complete only a part of

the task or to compose one small commentary with the help of the lecturer. In turn, the students gradually by observing and listening attentively to other more successful classmates were able to get involved in the work and were already working on the same level as the other students in the next case studies. When solving the case, the students' oral speech was activated and they were included in the interaction with each other to choose appropriate language tools. In the end, the students came to a compromise solution, the task contributed to the development of effective business communication skills in a foreign language.

The nature and principles of heuristic approach suggest that its main benefits include enhanced critical thinking, increased motivation and engagement, improved retention as well as development of metacognitive skills. Students develop analytical skills by identifying linguistic patterns independently, actively participate in discovery which makes learning more dynamic and enjoyable, their self-discovered knowledge is remembered longer than passively received information. Finally, students learn how to learn and become more autonomous in their language acquisition.

Nevertheless, heuristic approach presents multiple challenges: student resistance to non-traditional methods, time-consuming lesson preparation and difficulty in assessing process-based learning. In order to minimize the abovementioned limitations, lecturers should gradually introduce heuristic activities, starting with highly structured tasks; use pre-designed heuristic materials (e.g., discovery grammar worksheets) and implement reflective journals, peer assessments and portfolio evaluations.

The heuristic approach transforms ESL classrooms into dynamic environments where students actively engage with language rather than passively absorb rules. By fostering discovery, problem-solving, and critical thinking, this method not only improves linguistic competence but also equips learners with skills for lifelong language acquisition. While challenges exist, careful implementation and a balanced approach can maximize its effectiveness. Future research should explore technology-enhanced heuristic learning, such as AI-assisted discovery tools, to further innovate ESL instruction.

Thus, heuristic tools contribute to the development of students' creative communication skills both in written and oral forms in a foreign language. The introduction of heuristic approach into the process of teaching English at university to ESL students opens up wide learning opportunities: students not only achieve results in mastering language skills and special knowledge, but also gain experience in solving problems themselves through independent search for solutions and discussion of results in a group.

The problematic nature of heuristic learning forms students' ability to see the problem, find ways to solve it, build a chain of evidence and a plan for their ver-

ification as well as draw conclusions from the analysis thanks to the opportunity to perform independent actions. Heuristic tools have a significant potential for the formation of creative thinking in students, which is directly related to the development of their communicative competence in a foreign language. Further investigation of the possibilities of using heuristic approach in teaching English to ESL university students presents an important area for further research.

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互联网与新媒体时代新闻学的创新发展
INNOVATIVE DEVELOPMENT OF JOURNALISM IN THE ERA OF
THE INTERNET AND NEW MEDIA

Rong Tian Qi

Undergraduate Student

Belarusian State University, Minsk, Belarus

摘要.随着信息技术的快速发展,互联网与新媒体已成为新闻传播的重要平台,深刻影响着传统新闻理论与实践。本文探讨互联网与新媒体时代新闻学的创新发展,分析新闻生产、传播模式及受众互动的变革,并提出应对这些变化的策略,为新闻学的研究与实践提供有价值的参考。

关键词: 新闻学; 互联网与新媒体; 创新发展

Abstract. *With the rapid development of information technology, the Internet and new media have become important platforms for news dissemination, profoundly affecting traditional journalism theory and practice. This paper explores the innovative development of journalism in the era of the Internet and new media, analyses changes in news production, communication models, and audience interaction, and proposes strategies to address these changes, providing valuable references for journalism research and practice.*

Keywords: *Journalism; Internet and New Media; Innovative Development.*

I. Introduction

Nowadays, it is the era of the online media. Each change is already underway and the Internet and new media technologies have already changed the ecosystem of news dissemination greatly. Traditional journalism theories have undergone new sort of challenges where there are new journalistic practices and must change and innovate to keep up with the times and assist in guiding the journalistic practice.

II. Current Development of Journalism in the Internet and New Media Era

A. Transformation of News Production Models

In the old media known as the era of traditional media, news production is being done by professional journalists who work with a very strict editorial process. Although development of the news production subjects has been becoming more diversified in the Internet and new media era, the direction to search the future of

the news production has not yet been mapped out. Social media platforms are also being used as “citizen journalist” by ordinary citizens so they can release news information too. However, the timeliness of news production has greatly increased due to this phenomenon but at the same time it raises issues with authenticity and accuracy of the information.

B. Shift in Communication Models

Formerly, news communication was thought to be of the unidirectional type in which news is transmitted by media to the audience. Communication models have become more interactive and multidirectional in the Internet and new media environment. News now is not about transmitting information, it is a two way street where audiences are not only mere receptors but participants in the news dissemination process: audience can comment, like and share news content, and can even go further to generate their own secondary content from news.

C. Changes in Audience Roles

The Internet and the usage of new media have essentially altered the role of an audience. Today they do not simply receive information passively as provided by the media but can actively choose and obtain news on their lines of interest and needs. Furthermore, audiences can inform their views and opinion on social media platforms, they can discuss and share their news events and become potent participants in the news upload process.

III. Innovative Directions of Journalism in the Internet and New Media Era

A. Emergence of Converged Journalism

Converged journalism is spelling the integration of different media forms (text, images, sound and video) to let news events appears in a more 2D richer and multi-dimensional. The journalism that way meets diverse information needs of audiences and at the same time strengthens the effectiveness and influence of the dissemination of news.

B. Development of Data Journalism

Data journalism is hence the process of using data mining and analysis techniques to extract valuable information from the big new data and present the same in visual format. By virtue of data journalism, audiences have a better understanding of and an ability to analyse complex news events and get new insights and methods on news reporting.

C. Widespread Adoption of Mobile Journalism

Since more and more people use mobile Internet to access news, news somehow looks very different in mobile Internet form. Mobile journalism fits the audience's need to access news anytime, anywhere and can be characterized by convenience and timeliness as well as personalization. In order to enhance the user experience of mobile journalism, news media must optimize news content and dissemination methods for mobilized platforms.

IV. Challenges Faced by Journalism in the Internet and New Media Era

A. Challenges to Information Authenticity

In the era of information overload, the information is so vast and varied to such sources of information on the Internet and new media that it is difficult to separate what was right from what was wrong. Online, false information and rumours can spread quickly and such can pose a serious challenge to news authenticity. Information verification and gate-keeping of news media has to be enhanced to strengthen the authenticity and credibility of the news media.

B. Challenges to Professional Competence

New media and the emergence of the Internet have raised the bar for professional journalists' competence skills. In addition to traditional news reporting and editing skills, journalists must also have new media technology, data analysis, video production and more. In addition, they have to have good information literacy and media literacy as they need to quickly identify and process a variety of types of information.

C. Ethical and Moral Challenges

New media and the emergence of the Internet have raised the bar for professional journalists' competence skills. In addition to traditional news reporting and editing skills, journalists must also have new media technology, data analysis, video production and more. In addition, they have to have good information literacy and media literacy as they need to quickly identify and process a variety of types of information.

V. Strategies for Response

A. Strengthening Journalism Education and Training

With the development of times needed, the curriculum of journalism program in universities and journalism education institutions is to be adjusted to the Internet and the new media era, introducing the courses of new media technology, data analysis, converged journalism etc to cultivate compound journalism talents who can adapt to the development of time.

B. Promoting Media Convergence and Innovation

To this end, news media should step up the speed on the process of convergence of new media and traditional media, removing hindrances and thus achieving the sharing and best allocation of the means of implementation. On the same, the media should also look into the new forms and new content in dissemination to extend reach and influence of the news.

C. Enhancing Industry Self-discipline and Regulation

The journalists should improve themselves to achieve the self-discipline, and then establish the strict professional ethics and industry standard, strengthen the news media and practitioners' supervision and management standards. Good online dissemination environment should be maintained, relevant government de-

partments also should strengthen the regulation of the Internet and new media, crack down on illegal activities and false information.

VI. Conclusion

The development of journalism in the internet and new media era has never threatened as much to it. In order to adjust to the time, the journalism theory and practice needs to innovate and develop constantly. Strengthening journalism education and training, promoting media convergence and media innovation, improving industry self-discipline and regulation all these measures are able to solve the problems created by the Internet and the new media period, promote the healthy development of journalism and provide society with greater quality, accuracy and timeliness news and information services.

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书面表达英语双元音、单元音和双元音的字母及其组合
**LETTERS AND THEIR COMBINATIONS REPRESENTING
ENGLISH DIPHTHONGS, MONOPHTHONGS AND
DIPHTHONGS IN WRITING**

Rukhmanova Darya Dmitriyevna

Student

*In. Yaz., Foreign Languages, Interpretation and Translation Centre,
Tyumen, Russia*

Shilikov Sergey Ivanovich

Candidate of Pedagogical Sciences, Associate Professor

*In. Yaz., Foreign Languages, Interpretation and Translation Centre,
Tyumen, Russia*

摘要. 本文旨在研究俄罗斯联邦教育机构英语课堂教学人员在教学活动中英语元音（单元音、双元音和双元音变体）的图形拼写问题。作者确定了音素图形拼写的主要方式，即字母、字母与标点符号的组合以及构成相关音素的字母。

关键词： 双元音变体、双元音、教学活动、英语、图形拼写、单元音、教学人员。

Abstract. *The article is devoted to the study of the problem of graphic spelling of English vowel sounds (monophthongs, diphthongs and diphthongoids) in educational activities of pedagogical workers in English classes at educational institutions in the Russian Federation. The authors identify the main ways of graphic spelling of the phonemes, namely letters, combinations of letters and punctuation marks and letters used in the formation of the sounds in question.*

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

In 2012, the Russian Legislature adopted *Federal Act "About Education in the Russian Federation"* [8]. Under the Act, none but educational institutions, organizations carrying out education and individual entrepreneurs are entitled to render educational activities [8. Article 21]. The Act stipulates that individual entrepreneurs render educational activities directly or indirectly by employing pedagogical workers [8. Article 32]. The educational activities of individual entrepreneurs within the framework of teaching English cover a very diverse target audience that includes pre-school children, students of secondary and higher educational insti-

tutions, individuals, representatives of legal entities. These groups are currently presented by citizens of the Russian Federation, the CIS and foreign countries.

The year of 2015 initiated our research which was planned that same year, done in 2015-2024 and approved in 2025 at *In. Yaz. – Foreign Languages, Interpretation and Translation Center*. 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* – [ɛə], *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. The introductory [10], introductory and phonetic courses [6], English phonetics [15] and phonology manuals [14], [20] at that time 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 thoroughly.

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 2 diphthongs, 10 monophthongs and 8 diphthongs [2], [4], [6] omitting other 12 vowel consonant sounds [9], [10].

Vowel sound [i:] can be represented by vowel letters *e* (*genius* ['dʒi:nɪəs]), *i* (*fatigue* [fə'ti:g]), by consonant letters *b* (*BBC* [bi:bi:'si:]), *c* (*CNN* [si:en'en]), *d* (*PhD* [pi:ɛtʃ'di:]), *g* (*NGO* [endʒi:'əv]), *p* (*PA* [pi:'eɪ]), *t* (*t-shirt* ['ti:ʃə:t]), *v* (*VIP* [vi:ai'pi:]), *z* (*Zz* [zi:]), by French letter *ï* (*naïve* [nai'i:v] or [na:'i:v] or *naïve* [na:'i:v]), and by groups of letters *ae* (*algae* ['ældʒi:]), *ea* (*grease* [gri:s]), *ee* (*seethe* [si:ð]), *eh* (*vehicle* ['vi:ɪkl]), *ei* (*protein* ['prəʊti:n]), *eo* (*people* ['pi:pl]), *ey* (*key* [ki:]), *ie* (*retrieve* [ri'tri:v]), *oe* (*Phoenix* ['fi:niks]), *uay* (*quay* ['ki:]). Sound [i:] can be put in the opening (*eat* [i:t]), central (*scheme* [ski:m]) and end-

ing (*payee* [peɪ'i:]) position of lexical units. One does not meet it in the neutral position. Diphthongoid [i:] is represented by three vowel letters (*e, i, ī*), by eight consonant letters (*b, c, d, g, p, t, v, z*) and by 10 groups of letters (*ae, ea, ee, eh, ei, eo, ey, ie, oe, uay*). In nine cases, this phoneme is made in graphic spelling by groups of vowel letters (*ae, ea, ee, ei, eo, ey, ie, oe, uay*) and in one case by a group of a vowel and a consonant letters (*eh*).

Vowel sound [u:] can be represented by vowel letters *o* (*tomb* [tu:m]), *u* (*ruth* [ru:θ]), by consonant letters *q* (*IQ* [aɪ'kju:]), *w* (*WC dAblju:'si:*) and by groups of letters *eau* (*beauty* ['bju:ti]), *eu* (*pharmaceutical* [fɑ:mə'sju:tɪkəl]), *eu* or *oeu* (*maneuver* or *manoeuver* [mə'nu:və]), *ew* (*screw* [skru:]), *heu* (*rheum* [ru:m]), *hou* (*ghoul* [gu:l]), *iew* (*review* [ri'vju:]), *oe* (*canoe* [kə'nu:]), *oo* (*maroon* [mə'ru:n]), *ou* (*acoustics* [ə'ku:stɪks]), *ough* (*through* [θru:]), *ue* (*rue* [ru:]), *ueue* (*queue* [kju:]), *ui* (*bruise* [bru:z]), *wo* (*two* [tu:]). Sound [u:] can be put in the opening (*Oops* [u:ps]), central (*shrewd* [fru:d]) and ending (*bamboo* [bæm'bu:]) position of lexical units. One does not meet it in the neutral position. Diphthongoid [u:] is represented by two vowel letters (*o, u*), two consonant letters (*q, w*) and by 16 groups of letters (*eau, eu, eu, ew, heu, hou, iew, oe, oeu, oo, ou, ough, ue, ueue, ui, wo*). In ten cases, this phoneme is made in graphic spelling by groups of vowel letters (*eau, eu, eu, oe, oeu, oo, ou, ue, ueue, ui*) and in six cases by groups of vowel and consonant letters (*ew, heu, hou, iew, ough, wo*).

Vowel sound [ʌ] can be represented by English letters *o* (e.g., *dozen* ['dʌzn]), *u* (*thus* [ðʌs]), *w* (*WTO* [dʌblju:ti:'əʊ]) and by groups of letters *oe* (*does* [dʌz]), *oo* (*blood* [blʌd]), *ou* (*double* ['dʌbl]), *uh* (*uh-huh* [ʌ'hʌ]) or [ʊ'hʊ]). Sound [ʌ] can be put in the opening (*oven* ['ʌvn] or ['ʌvən]) and central (*flood* [flʌd]) position of lexical units. One does not meet it in the neutral and ending position of lexical units. Monophthong [ʌ] 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* [dɪz'a:stə]), *e* (*ensemble* [a:n'sa:mbəl]), *r* (*R&D* [a:(r)ən'di:]) and by groups of letters *ah* (*Ah* [a:]), *al* (*almond* ['a:mənd]), *ar* (*arc* [a:k]), *are* (*aren't* ['a:nt]), *arre* (*bizarre* [brɪ'zɑ:]), *au* (*laugh* [la:f]), *ear* (*hearth* [ha:θ]), *er* (*sergeant* ['sɑ:dʒənt]), *ir* (*memoir* [mem'wa:]), *oi* (*turquoise* ['tɜ:kwa:z]), *ois* (*bourgeois* ['buəʒwa:]), *uar* (*guard* [ga:d]). Sound [a:] can be put in the neutral (*Ah* [a:]), opening (*ask* [a:sk]), central (*barley* ['ba: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* ['ɪmɪdʒ]), *e* (*depart* [dɪ'pa:t]), *e* or *i* (*enquire/inquire* [ɪn'kwɪə]), *i* (*inlet* ['ɪnlet]), *o* (*women* ['wɪmɪn]), *u* (*busy* ['bɪzɪ]), *y* (*hymn* [hɪm]), by French letter *é* (*protégé* ['prɒtɛʒeɪ]) and by groups of the letters *ae* (*palaeontology* [pælɪɒn'tɒlədʒɪ]), *ai* (*fountain* ['faʊntɪn]), *ay* (*Friday* ['fraɪdɪ]), *ea* (*Guinea* ['gɪni]), *ee* (*yankee* ['jæŋki]), *ehea* (*forehead* ['fɔrɪd]), *ei* (*forfeit* ['fɔ:fɪt]), *eig* (*sovereign* ['sovərɪn]), *eo* (*pigeon* ['pɪdʒɪn] or ['pɪdʒən]), *ey* (*kidney* ['kɪdnɪ]), *ia* (*marriage* ['mæɪrɪdʒ]), *ie* (*kerchief* ['kə:tʃɪf]), *ui* (*guild* [gɪld]), *wi* (*Greenwich* ['grɪnɪdʒ]). Sound [ɪ] can be put in the opening (*ink* [ɪŋk]), central (*climate* ['klaɪmɪt]) and ending (*plenty* ['plenti]) position of lexical units. One does not meet it in the neutral position.

Vowel sound [ə] can be represented by letters *a* (*wrath* [rəθ]), *e* (*entrepreneur* [ɒntrəprə'nə:] or [a:ntrəprə'nə:]), *o* (*inoculate* [ɪ'nɒkjuleɪt]) and by groups of letters *ach* (*yacht* [jɒt]), *au* (*sausage* ['sɔsɪdʒ]), *ea* (*Sean* [ʃɒn]), *ho* (*honest* ['ɒnɪst]), *oh* (*John* [dʒɒn]), *ou* (*lough* [ləh]), *ow* (*knowledge* ['nɒlədʒ]). Sound [ə] can be put in the opening (*onto* ['ɒntu:]) and central (*pond* [pɒnd]) position of lexical units. One does not meet it in the neutral and ending position of lexical units.

Vowel sound [o:] can be represented by letters *a* (*gall* [go:l]), *o* (*sanatorium* [sænə'to:riəm]) and by groups of letters *al* (*stalk* [sto:k]), *aor* (*extraordinary* [ɪks'tro:dənəri]), *ar* (*swarm* [swo:m]), *au* (*taunt* [to:nt]), *augh* (*naught* [no:t]), *aw* (*thaw* [θo:]), *awe* (*awesome* ['o:səm]), *hau* (*haut* or *haute* [o:t]), *oa* (*broad* [bro:d]), *oar* (*hoard* [ho:d]), *oor* (*floor* [flo:]), *or* (*enforce* [ɪn'fɔ:s]), *ore* (*pore* [po:]), *orps* (*corps* [ko:]), *ort* (*rapport* [ræ'po:]), *ough* (*ought* [o:t]), *our* (*four* [fo:]), *wor* (*sword* [so:d]). Sound [o:] can be put in the neutral (*or* [o:]), opening (*all* [o:l]), central (*walk* [wo:k]) and ending (*door* [do:]) position of lexical units.

Vowel sound [ʊ] can be represented by letters *o* (*bosom* ['bʊzəm]), *u* (*bull* [bʊl]) and by groups of letters *oo* (*nook* [nʊk]), *ou* (*haute couture* [əʊtkʊ'tjʊə]), *oul* (*should* [ʃʊd]). Sound [ʊ] can be put in the opening (*Ugh* [ʊh]) and central (*butcher* ['bʊtʃə]) 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* ['ækrɪd]), *i* (*meringue* [mə'reɪŋ]) and by groups of letters *ai* (*plait* [plæt]), *a'a* (*ma'am* [mæm]), *ua* (*guarantee* [gæɪən'ti:]). 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* ['perəl]), *u* (*bury* ['berɪ]), *f* (*FOB* [efəʊ'bi:]), *l* (*LTD* [elti:'di:]), *m* (*BMW* [bi:em'dʌblju:]), *n* (*NGO* [endʒi:'əv:]), *s* (*SOS* [esəʊ'es]), *x* (*x-ray* ['eksreɪ]), *z* (*ZT* [zed'ti:]), by French letter *é* (*apéritif* [ə'perəti:f]) and by groups of letters *ai* (*said* [sed]), *ea* (*pleather* ['pleðə]), *eg* (*phlegm* [flem]), *ei* (*leisure* ['leɪʒə]), *eo* (*jeopardize* ['dʒəpədəɪz]), *ie* (*friend* [frend]), *ue* (*baguette* [bæ'get]). Sound [e]

can be put in the opening (*embassy* [*'embəsi*]) and central (*twenty* [*'twenty*]) position of words. One does not meet it in the neutral and ending position of lexical units.

Vowel sound [ə:] can be represented by groups of letters *ieu* (*milieu* [*'mil-je:ɪ*]), *ear* (*pearl* [*pə:l*]), *eor* (*George* [*dʒə:dʒ*]), *er* (*tertiary* [*'tə:ʃəri*]), *ere* (*were* [*wə:*]), *err* (*inferred* [*in'fə:d*]), *eur* (*amateur* [*'æmətə:*] or [*'æmətə*]), *ir* (*dirge* [*də:dʒ*]), *olo* (*colonel* [*'kə:nəl*]), *or* (*attorney* [*ə'tə:nɪ*]), *our* (*courtesy* [*'kə:təsi*]), *ur* (*nocturnal* [*nɒk'tə:nəl*]). Sound [ə:] can be put in the neutral (*Er* [*ə:*]), opening (*earnest* [*'ə:nɪst*]), central (*hurt* [*'hə:t*]) and ending (*infer* [*in'fə:*]) position of lexical units.

Vowel sound [ə] can be represented by letters *a* (*abrupt* [*ə'brʌpt*]), *e* (*fraudulent* [*'fro:dʒələnt*]), *i* (*principal* [*'prɪnsəpl*]), *o* (*custody* [*'kʌstədi*]), *u* (*focus* [*'fəʊkəs*]) and by groups of letters *ai* (*villain* [*'vɪlən*]), *ar* (*leopard* [*'lepəd*]), *ay* (*always* [*'o:lwəz*] or [*'o:lweɪz*]), *ea* (*sergeant* [*'sa:dʒənt*]), *eo* (*sturgeon* [*'stə:dʒən*]), *eou* (*outrageous* [*aut'reɪdʒəs*]), *er* (*southern* [*'sʌðən*]), *er* or *re* (*fibre* or *fiber* [*'faɪbə*]), *eu* (*pasteurize* [*'pæstʃəraɪz*]), *eur* (*chauffeur* [*'ʃəʊfə*] or [*'ʃəʊfə:*]), *gh* (*Edinburgh* [*'edɪnb(ə)rə*]), *hu* (*sorghum* [*'so:gəm*]), *ia* (*initial* [*'ɪnɪʃəl*]), *ie* (*sufficient* [*sə'fɪʃənt*]), *io* (*tension* [*'tenʃən*]), *iou* (*vicious* [*'vɪʃəs*]), *iour* (*saviour* [*'seɪvjə*]), *iu* (*premium* [*'pri:mjəm*] or [*'pri:mɪəm*]), *oar* (*cupboard* [*'kʌbəd*]), *oi* (*tortoise* [*'to:təs*]), *or* (*tailor* [*'teɪlə*]), *ou* (*ominous* [*'ɒmɪnəs*]), *ough* (*thorough* [*'θʌrə*]), *o(u)r* (*vigour* or *vigor* [*'vɪgə*]), *re* (*macabre* [*mə'ka:bə*] or [*mə'ka:br*]), *ue* (*guerilla* [*gə'rɪlə*]), *uer* (*lacquer* [*'lækə*]), *uor* (*liquor* [*'lɪkə*]), *ur* (*surmountable* [*sə'mauntəbl*]), *ure* (*torture* [*'to:tʃə*]), *wer* (*answer* [*'a:nsə*]), by a combination of the apostrophe ('), a consonant and a vowel letters '*re*' (*we're* [*'wɪə*]), a vowel letter and the apostrophe *o'* (*o'clock* [*ə'klɒk*]). Sound [ə] can be put in the opening (*about* [*ə'baʊt*]), central (*tenant* [*'tenənt*]), central and ending simultaneously (*opera* [*'opərə*]) and ending (*clever* [*'klevə*]) 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 vowel sound [aʊ] can be represented by combinations of English letters *au* (e.g. *Saudi Arabia* – [*saudɪə'reɪbiə*]), *ou* (*tousle* – [*'taʊzl*] or [*'taʊzəl*]), *ough* (*plough* – [*plau*]), *ow* (*scowl* – [*skaul*]). The sound [aʊ] can be placed in the zero (*Ow* – [*au*]), initial (*out* – [*aut*]), middle (*house* – [*haus*]) and final (*brow* –

[*brau*]) position of words. The diphthong [au] is represented by four combinations of letters (*au, ou, ough, ow*). In two cases, this phoneme is formed in graphic spelling by combinations of vowel letters (*au, ou*) and in two cases – by combinations of vowel and consonant letters (*ough, ow*).

The vowel sound [ɔɪ] can be represented by combinations of letters *oi* (*moist* – [mɔɪst]), *ois* (*Illinois* – [ɪlɪ'nɔɪ]), *oy* (*deploy* – [dɪ'plɔɪ]). The sound [ɔɪ] can be placed in the initial (*oyster* – [ɔɪstə]), middle (*avoid* – [ə'vɔɪd]) and final (*destroy* – [dɪ'strɔɪ]) position of words. The diphthong [ɔɪ] is represented by three combinations of letters (*oi, ois, oy*). In two cases, this phoneme is formed in graphic spelling by combinations of vowel letters (*oi, oy*) and in one case – by a combination of vowel and consonant letters (*ois*).

The vowel sound [ɪə] can be represented by the letter *e* (*query* – [ˈkwɪərɪ]) and by combinations of letters *ea* (*ideal* – [aɪ'dɪəl]), *ear* (*sear* – [sɪə]), *eer* (*veneer* – [vɪ'nɪə] or [və'nɪə]), *eir* (*weird* – [wɪəd]), *eo* (*theory* – [ˈθiərɪ]), *eou* (*hideous* – [ˈhɪdɪəs]), *ere* (*adhere* – [əd'hɪə]), *eu* (*linoleum* – [lɪ'nəʊlɪəm]), *hea* (*gonorrhea* – [gɒnə'rɪə]), *ia* (*guardian* – [ˈgɑːdɪən]), *iar* (*peculiar* – [pɪ'kjuːliə]), *ie* (*nutrient* – [ˈnjuːtriənt]), *ier* (*pierce* – [pɪəs]), *io* (*oblivion* – [əb'lvɪən]), *ior* (*warrior* – [ˈwɔːrɪə]), *iou* (*tedious* – [ˈtiːdɪəs]), *ir* (*souvenir* – [su:və'nɪə]), *iu* (*premium* – [ˈpriːmiəm]), *ya* (*Libya* – [ˈlɪbɪə]). The sound [ɪə] can be placed in the zero (*ear* – [ɪə]), initial (*earshot* – [ɪəʃɒt]), middle (*material* – [mə'tɪəriəl]) and final (*fear* – [fiə]) position of words.

The vowel sound [əʊ] can be represented by the letter *o* (*rodent* – [ˈrəʊdnt] or [ˈrəʊdənt]) and by combinations of letters *aoh* (*pharaoh* – [ˈfɛərəʊ]), *au* (*sauté* – [ˈsəʊteɪ]), *eau* (*plateau* – [ˈplætəʊ]), *eou* (*Seoul* – [səʊl]), *ew* (*sew* – [səʊ]), *hau* (*haute couture* – [əʊtkʊ'tuə], [əʊtkʊ'tjuə] or [əʊtkuː'tjuə]), *ho* (*Rhode Island* – [rəʊd'aɪlənd]), *'ho* (*table d'hôte* – [taːbl'dəʊt] or [taːbəl'dəʊt]), *oa* (*float* – [fləʊt]), *oe* (*foe* – [fəʊ]), *ol* (*folk* – [fəʊk]), *oo* (*brooch* – [brəʊtʃ]), *ou* (*soul* – [səʊl]), *ough* (*dough* – [dəʊ]), *ow* (*mellow* – [ˈmeləʊ]), *owe* (*owe* – [əʊ]). The sound [əʊ] can be placed in the zero (*Oh* – [əʊ]), initial (*own* – [əʊn]), middle (*note* – [nəʊt]) and final (*polo* – [ˈpəʊləʊ]) position of words.

The vowel sound [aɪ] can be represented by the letters *i* (*grime* – [ɡrɪm]), *y* (*ply* – [plaɪ]) and by combinations of letters *ei* (*skein* – [skaɪn]), *eight* (*height* – [haɪt]), *ey* (*geyser* – [ˈɡaɪzə]), *eye* (*eye* – [aɪ]), *ie* (*tie* – [taɪ]), *ig* (*benign* – [bɪ'nam]), *igh* (*knight* – [naɪt]), *ui* (*disguise* – [dɪs'ɡaɪz]), *uy* (*buy* – [baɪ]), *ye* (*bye* – [baɪ]). The sound [aɪ] can be placed in the zero (*I* – [aɪ]), initial (*either* – [ˈaɪðə]), middle (*neither* – [ˈnaɪðə]) and final (*verify* – [ˈverɪfaɪ]) position of words.

The vowel sound [ʊə] can be represented by the letter *u* (*rural* – [ˈrʊərl] or [ˈrʊərəl]) and by combinations of letters *ewer* (*skewer* – [ˈskjuə]), *oor* (*moor* – [mʊə] or [moː]), *our* (*dour* – [dʊə]), *ua* (*septuagenarian* – [septɪʋədʒɪ'nɛəriən]), *uar* (*Stuart* – [ˈstjuət]), *ue* (*fuel* – [fjuəl]), *ueur* (*liqueur* – [lɪ'kjʊə]), *uou* (*sump-*

tuous – [ˈsʌmptʃʊəs] or [ˈsʌmptʃʊəs]), *ure* (*obscure* – [ɒbsˈkjʊə]). The sound [ʊə] can be placed in the middle (*gourmet* – [ˈɡʊəmeɪ]) and final (*poor* – [pʊə]) position of words.

The vowel sound [ɛə] can be represented by the letters *a* (*pharaoh* – [ˈfɛərəʊ]), *e* (*wisteria* – [wɪsˈtɛəriə]) and by combinations of letters *ae* (*aerodynamics* – [ɛərədaɪˈnæmɪks]), *ai* (*dairy* – [ˈdeəri]), *air* (*fair* – [fɛə]), *aire* (*questionnaire* – [kwɛstʃəˈnɛə]), *are* (*welfare* – [ˈwɛlfɛə]), *ayor* (*mayor* – [mɛə]), *ear* (*forebear* – [ˈfoːbeə]), *eir* (*their* – [ðɛə]), *er* (*concierge* – [kɒnsɪˈɛəʒ]), *ere* (*therefore* – [ˈðɛəfoː]). The sound [ɛə] can be placed in the zero (*air* – [ɛə]), initial (*area* – [ˈɛəriə]), middle (*whereas* – [wɛəˈræz]) and final (*where* – [wɛə]) position of words.

The vowel sound [eɪ] can be represented by the vowel letters *a* (*slate* – [sleɪt]) and *e* (*elite* – [eɪˈliːt]), by the consonant letters *h* (*PhD* – [piːeɪtʃˈdiː]), *j* (*J.F. Kennedy* – [dʒeɪfˈkenɛdi]) and *k* (*KGB* – [keɪdʒiˈbiː]), by the French letter *é* (*protégé* – [ˈprɒtʒeɪ]) and by combinations of letters *ae* (*Gaelic* – [ˈgeɪlɪk]), *ag* (*champagne* – [ʃæmˈpeɪn]), *ai* (*maim* – [meɪn]), *aig* (*campaign* – [kæmˈpeɪn]), *aigh* (*straight* – [streɪt]), *ay* (*relay* – [riːˈleɪ]), *ea* (*steak* – [steɪk]), *ee* or *ée* (*matinee* – [ˈmætiːneɪ]), *entrée* – [ˈɒntreɪ] or [ˈɑːntreɪ]), *ei* (*abseil* – [ˈæbsɛɪl]), *eig* (*reign* – [reɪn]), *eigh* (*freight* – [freɪt]), *er* (*foyer* – [ˈfɔɪeɪ]), *et* (*gourmet* – [ˈɡʊəmeɪ]), *ey* (*fey* – [feɪ]), *oa* (*gaol* – [dʒeɪl]), *uet* (*bouquet* – [bʊˈkeɪ]). The sound [eɪ] can be placed in the zero (*Eh* – [eɪ]), initial (*eight* – [eɪt]), middle (*tame* – [teɪm]) and final (*bay* – [beɪ]) position of words.

The research allowed us to work out and prepare for publishing a guide-book of drills containing lists of words formed by means of ABC letters and their combinations used to denote the English sounds. 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, organizations carrying out education and by individual entrepreneurs 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 English language due to its constant development.

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宗教的内化与外化

INTERIORIZATION AND EXTERIORIZATION IN RELIGION

Biryulina Tatiana Vladimirovna

*Candidate of Physico-Mathematical Sciences, Associate Professor
Irkutsk State University*

注释：本文探讨了德国哲学家路德维希·费尔巴哈关于宗教的观点，他认为宗教是人类欲望、恐惧和需求在虚构的神圣实体上的投射。因此，宗教信仰会导致人与自我疏离，剥夺其内在力量，并加剧对外部超自然力量的依赖。本文还探讨了宗教规范和价值观的内化过程，以及宗教体验的外化过程。内化被认为是外部社会、文化和情感因素转化为内在因素的过程，塑造了个人的信仰、价值观和世界观。尽管异化过程与外化和内化过程相似，但需要指出的是，无神论者的方法没有考虑到一种特殊的人类体验——宗教体验——的存在，并否定其对个人的价值，将其简化为神经症和精神失调。内化始于个人体验和精神体验。这些时刻构成了个人内心世界的基础，为反思和接受宗教教义创造了空间。

关键词：内化、外化、宗教体验、异化。

Annotation. *The article examines the views of the German philosopher Ludwig Feuerbach on religion as a projection of human desires, fears and needs on imaginary divine entities. As a result, religious beliefs contribute to alienating a person from himself, depriving him of inner strength and stimulating dependence on external supernatural forces. The article also explores the process of interiorization of religious norms and values, as well as the exteriorization of religious experiences. Interiorization is considered as a process by which external social, cultural, and emotional factors become internal, shaping personal beliefs, values, and perceptions of the world. Despite the similarity of the process of alienation on the one hand and exteriorization and interiorization on the other, it is noted that the atheistic approach does not take into account the existence of a special human experience – religious experience and negates its value for the individual, reducing it to neuroses and mental disharmony. Interiorization begins with personal experiences and spiritual experiences. These moments form the basis of the individual's inner world, creating a space for reflection and acceptance of religious dogmas.*

Keywords: *interiorization, exteriorization, religious experience, alienation.*

Religion in the modern world is a complex social phenomenon that sometimes plays an important role in the life of society and individuals. Moreover, religion is presented not only as a system of beliefs and rituals, but also as an important tool for social integration and regulation.

The Russian sociologist of religion I.N. Yablokov [1] identifies a number of functions peculiar to religion: ideological, compensatory, communicative, regulatory, integrating-disintegrating, culturotranslating, legitimizing-delegitimizing. Thus, religion shapes a person's worldview. It provides individuals with answers to fundamental questions about life, death, the meaning of existence, and moral values. Religious beliefs and practices help people understand the world around them and find their place in it.

Religion helps people cope with existential fears and uncertainty by offering them hope and solace. In this context, religion performs the function of "psychological support", allowing people to find meaning in difficult periods of life. In times of stress or loss, people often turn to religion for solace. Religious rituals can help to cope with grief or anxiety by providing a structure for experiencing such complex emotions. Rituals can generally be a means of creating a sense of security and stability in an individual's life, helping them make sense of life's conflicts and find meaning even in the most difficult situations.

Religion also has a function of social integration. Religious institutions contribute to the formation of social ties and communities. Religion unites people around common values and norms of behavior, creating a sense of belonging to a group. This becomes especially important in conditions of social instability or crisis, when people begin to seek support in a collective identity. Religious practices (for example, joint prayers or holidays) strengthen social ties between community members, create a space for interaction and exchange of experiences, which contributes to the formation of a sense of unity. Thus, religion becomes an important element of the social structure, contributing to the maintenance of order and stability.

In addition, religion influences the moral and ethical attitudes of society and acts as a regulator of social relations. Many moral values have their roots in religious teachings. Religion forms the idea of good and evil, justice and injustice, which affects the behavior of individuals and their interaction with others. Historically, religious precepts have often served as the basis for the formation of legal laws and social norms.

Nevertheless, religion also has potentially destructive aspects. Religious conflicts, fanaticism, and extremism are the negative consequences that can arise from excessive adherence to certain beliefs or dogmas.

Since religion often affects deeply personal and emotional aspects of people's lives, even just discussing religious issues can cause strong emotions, conflicts and misunderstandings, which can even lead to violence.

According to this view, religion arises and exists primarily from relationships of unfreedom, dependence and limitation, domination and subordination, encompassing that sphere of human existence that cannot be controlled. Within the framework of a religious system, a person can experience security and liberation from oppressive circumstances, religion can give a sense of freedom and a surge of strength, but these feelings are derived from real relationships of dependence. The desire for the Highest or the Absolute arises from the awareness of the transience and ephemerality of human existence. Religion arises from such epistemological premises as ignorance of the unknown or mystery, limited knowledge, illusions of sensory perception, etc. It serves as a way to overcome self-alienation by transforming a person's own powers into those alien to him. As a result, there is a doubling of the world: the results of spiritual activity are separated from man and opposed to him, creating an idea of another world, endowed with separate beings living their own lives. Thus, a person begins to be dominated by the product of his own mind, which strengthens the alienation relationship. [2]

One of the key thinkers who developed this view of religion was the German philosopher Ludwig Feuerbach. In his work "The Essence of Christianity" (1841) [3] he argued that religion is a reflection of human desires, fears and needs projected onto imaginary divine beings. He believed that religious beliefs reflect human nature: people create images of gods, endowing them with their idealized features and their own superlative qualities. Thus, the gods become a reflection of human consciousness, embodying our desires and fears. Religious beliefs arise as a result of the projection process, when a person attributes an external objective reality to his inner experiences. For example, love, strength, wisdom, and justice are all qualities that we see in ourselves but attribute to higher powers. Thus, they become alienated from humans and acquire an independent existence. Religion leads to the alienation of a person from himself. Projecting one's best qualities onto God means that one is deprived of one's own strength and dignity. Instead of developing his abilities and striving for self-improvement, he relies on external supernatural powers. Religion thus slows down a person's spiritual development and makes him dependent on external forces. By creating such a dependent person, on the other hand, religion gives him solace. It becomes an illusory way to cope with the uncertainty of the world, the fear of death, and the desire to find solace and protection. Faith in God gives a person a sense of security and confidence in a chaotic world. The government uses religion as a tool of social control, when religious dogmas and rituals are used to subjugate the masses, suppress critical thinking and maintain the existing order.

L. Feuerbach's concept of religion as a projection of human desires and needs had a significant impact on many subsequent thinkers and researchers. For example, K. Marx was inspired by Feuerbach's ideas (especially the idea of alien-

ation). He transferred these ideas to the social sphere, arguing that religion is the “opium of the people,” allowing people to live more happily in an illusory world. According to Marx, religion serves as a tool that distracts people from real social problems and supports the existing order, justifying its inherent forms of exploitation. The founder of psychoanalysis Z.Freud also saw religion as a manifestation of unconscious desires and fears inherent in humans. In his book “The Future of an Illusion” (1927) [4] he argued that faith in God is a childhood neurosis associated with the need for protection and patronage. Religion, according to Freud, helps people cope with anxiety and feelings of helplessness in the face of death and natural disasters. Another researcher, E. Durkheim, one of the founders of sociology, studied religion from the point of view of its social function. In his work “Elementary Forms of Religious Life” (1912) [5] he argued that religion unites society by creating common values and norms of behavior. Gods and other sacred entities symbolize the collective interests of the group, strengthening solidarity within it. Subsequently, Feuerbach’s idea was adopted as one of the main ones in religious studies.

Thus, as a result of the initial alienation, religion acquires an external force over a person and the subsequent initiation into a religious way of being occurs as a result of the interiorization of religious norms and values. Interiorization is a process in which social, cultural, and emotional factors external to a person become internal, forming personal beliefs, values, and ways of perceiving the world. Interiorization involves the creation of internal models that help a person understand and interpret the world around them, and may include representations of themselves, other people, and social norms. The process of interiorization often occurs through social learning, when an individual learns norms, values, and behavior by observing other people (for example, parents, peers, or cultural patterns) and can be both conscious and unconscious. Internalization also includes the integration of emotional experience, when a person can recognize and process their emotions based on external events or interactions with other people, which affects their inner state and behavior. In the process of interiorization, a person forms his identity, including an idea of himself and his roles in society, which may include accepting certain social roles or belonging to certain groups. Cultural contexts also play an important role in interiorization, when the values and norms of society can be assimilated by an individual and become part of his inner world, influencing his behavior and character. Thus, interiorization allows external factors to become part of a person’s inner world, contributes to the formation of personal beliefs, values and identity, and also affects an individual’s emotional state and behavior. In relation to religion, interiorization refers to the process by which the external, social, and cultural aspects of religious practice and beliefs become internal, personal, and subjective.

The process of interiorization in religion, especially in relation to modern society, turns out to be more complex and ambiguous, reflecting the dynamics between individual experience and collective beliefs. Thus, interiorization often begins with a personal experience of faith, which may be associated with spiritual experiences such as prayer, meditation, or mystical experiences that lead to a deeper understanding and inner acceptance of religious teachings. People often begin to adapt traditional religious practices to their personal needs and circumstances. This may include choosing certain rituals or rituals that resonate most with their inner state. Interiorization also includes reflection on one's own beliefs and practices, when people can ask questions about the meaning of their religious beliefs, their relevance in the modern world, and how they relate to personal experience. Cultural changes can also contribute to interiorization, when external social norms and values influence how people perceive their faith. For example, secularization may lead people to seek more individual forms of spirituality outside of traditional religious structures. In the process of interiorization, traditional teachings can be reinterpreted or interpreted in a new way in such a way that this can lead to the emergence of new trends within religion or even to the creation of new forms of spirituality.

Thus, here we cannot avoid the issue directly related to spiritual experiences, religious experience and its expression. That is, to consider the process of exteriorization, in which internal mental processes (such as thoughts, feelings, experiences) become external and visible to others. In psychology, the term "exteriorization" is often used in the context of L.S. Vygotsky's theory [6] and his approach to the study of the development of thinking and communication. Exteriorization implies that a person's internal states (for example, emotions or cognitive processes) They can be expressed through actions, words, or other forms of communication, which allows other people to perceive and interpret internal states. The exteriorization of internal states can be not only verbal, but also have artistic expression (for example, creating a painting or writing poetry), or manifest themselves in behavior (for example, expressing joy through laughter or sadness through tears).

Exteriorization in religion is the process by which the internal, personal, and subjective aspects of faith and spirituality become external, manifesting themselves in social practices, rituals, and institutional forms. This process may include various aspects such as the expression of faith and religious experience through rituals and rituals, the creation of religious communities and the formation of religious institutions. Exteriorization also manifests itself in the fact that religion influences culture, social norms, legislation, and other aspects of public life.

The tradition of viewing religion as a social and psychological phenomenon arising from the human need for meaning, protection, and power has been developed by many thinkers. Despite the similarity of the process of alienation on the

one hand and exteriorization and interiorization on the other, it is worth noting that the atheistic approach does not take into account the presence of a special human experience – religious experience and negates its value for the individual, reducing it to neuroses and mental disharmony. Interiorization begins with personal experiences and spiritual experiences. These moments form the basis of the individual's inner world, creating a space for reflection and acceptance of religious dogmas. The topic of the interaction of interiorization and exteriorization in religion is extremely important for understanding the current state of religious life. It reflects the complexity and diversity of human experience, showing how faith and spirituality are integrated into everyday life and culture. Consideration of these processes helps to better understand the mechanisms of formation of religious identities and their role in society.

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预防人口脆弱性的新形式——俄罗斯紧急事务部工作人员与城市农业潜在参与者的互动

**A NEW FORM OF PREVENTING POPULATION VULNERABILITY
- INTERACTION OF RUSSIAN MINISTRY OF EMERCOM STAFF
WITH POTENTIAL PARTICIPANTS IN CITY FARMING**

Talalaeva Galina Vladlenovna

Doctor of Medical Sciences, Professor

Dobrynina Natalia Yuryevna

Candidate of Chemical Sciences, Senior Lecturer

Ural Institute of State Fire Service of EMERCOM of Russia

注释. 本文从传播学理论的角度, 探讨了高校学生(未来消防员)作为潜在传播者, 与参与新型创意产业——城市农业——的平民代表进行数字行为的算法。本研究的必要性在于: 在气候快速变化的条件下, 粮食安全风险上升, 大都市居民在适宜的场所内自发创造人工气候区的活动增多。样本量: 65人。

关键词: 社会传播、认知行为、志愿服务。

Annotation. *The article examines the algorithm of digital behavior of departmental university students (future firefighters) as potential communicators with representatives of the civilian population involved in a new form of creative industry – city farming – from the standpoint of communication theory. The need for the study is justified by the fact that in the conditions of a rapidly changing climate, food security risks increase and spontaneous activity of residents of megalopolises to create artificial climate zones in adapted premises increases. Sample size – 65 people.*

Keywords: *social communication, cognitive behavior, volunteering.*

The vulnerability of the population is a complex system, at each stage of development of which external and internal factors play a certain, sometimes interconnected role [1]. In connection with global warming, the temperature swings of which have territorial features depending on the geographic coordinates of settlements [2], the risks of violation of food security of the population are not the same in different territories. Residents of megacities responded most actively to the new challenge of a rapidly changing environment. In the Russian Federation, the development of digital greenhouses and hotbeds in adapted spaces of urban

buildings is gaining popularity [3] and is carried out, first of all, in Moscow, St. Petersburg, Novosibirsk. In the context of urbanization, environmental and man-made risks, the process of maximum use of urban spaces, providing city residents with a variety of healthy food [4] reduces the vulnerability of the population in terms of comprehensive security parameters both in peacetime and in wartime.

In recent years, training personnel for urban farming, as well as teaching the younger generation of Russians the basics of urban farming, has become relevant, in demand and is being implemented at all levels of education: in kindergartens, schools, colleges and universities, in the format of additional education, retraining and advanced training.

The author's analysis of the diversity of educational and methodological materials on city farming, posted on the Internet, revealed a number of gaps in the area of fire and environmental safety inherent in these information materials.

This article aims to rank the dangers posed by spontaneous urban farming in metropolitan areas and to find optimal ways to minimize these risks by training a new generation of firefighters and rescuers who are able to interact with the civilian population on social networks through digital dialogue.

The objectives of the study included investigating the algorithms of search and communication activity in the digital environment of students of a departmental university, future firefighters and rescuers.

Material and method of the research. The basis for the study was the analysis of literary data and the results of the author's empirical research. As a method for collecting information on the algorithms for implementing the search and cognitive activity of university students, a sociological survey was chosen using a specially developed methodology. Based on the definition of city farming as a way to reduce personal vulnerability in response to environmental threats, we considered it possible to extrapolate to the study of algorithms of search and cognitive activity in these conditions the study of algorithms of search and cognitive activity of respondents in other areas of their life, which also have an anti-stress effect in conditions of anxiety and uncertainty. As such an indicator, the question of searching and listening to musical works and fragments in the Internet system was formulated. In this case, we were interested in the algorithm of self-organization of search and cognitive activity of respondents, organized by them on their own initiative in the format of current educational, transport, information and everyday loads.

The questionnaire included 15 questions, some of which were formulated in an open form, which allowed respondents to express their opinions in an individual format. The analytical development of this report included respondents' answers to the following questions:

1. Do you like listening to music through gadgets (yes, no)?
2. What gadgets do you prefer for listening to music (mobile phone, tablet, laptop, desktop computer)?

3. What kind of sound do you like best (through headphones, from speakers, using stereo systems, other)?
4. What digital platforms do you listen to music on?
5. What do you do when you listen to music (driving, walking, reading, doing homework, etc.)?

Results obtained. The formation of city farming in its modern form as a form of manifestation of social activity of the population in the conditions of civil society was preceded by several stages of development of agricultural technologies aimed at ensuring food security of residents of urbanized territories.

In our opinion, the following can be listed: open-ground agriculture, closed-ground vegetable growing, controlled crop production, “smart” greenhouses, city farming of individual citizens in adapted premises. The last type of growing food products is not a purely commercial project, a number of city farming participants emphasize that they consider this activity as a hobby, a procedure for rest, relaxation and self-correction of the psychophysical state after hard work, as a way of psychological relaxation, stress relief, providing oneself with healthy food as an element of the health system and biohacking with the exchange of information on social networks with an interested list of Internet users. The last type of city farming, in our opinion, is closest to scientific volunteering and scientific research crowdsourcing.

Taking into account the classification of volunteering proposed by experts [5], the interaction of rescue service employees, including the Russian Emergencies Ministry, with city farming participants should be carried out in a variety of formats. Depending on the situation, it may be subject to the formats of informing and alerting the population provided for the organized and unorganized population, environmental volunteering in peacetime and the volunteer movement in emergency situations. The diversity of forms of city farming as a volunteer movement, its tendency to self-organization, deviation from the forms of information transfer generally accepted for official institutions, the tendency to disseminate data through the formed social networks and contacts impose new requirements on the work of the Russian Emergencies Ministry employees with the population. The following judgment can be made. The format of information interaction between the Russian Emergencies Ministry and city farming participants should include a variety of channels for transmitting useful information: informing through established communication channels, training interested parties in fire safety, creating an information space for the interests and requests of city farmers of different types of volunteering.

An analysis of the available teaching and methodological materials for training city farmers has shown that all of them, to one degree or another, ignore fire safety issues. At best, they consider fire safety issues of electrical wiring and electrical

equipment used to create an artificial microclimate in a room. The issues of the combustion characteristics of polymers used for interior decoration and fertilizers used for the production of plant products in closed spaces remain out of sight. In our opinion, this omission can be filled by the curricula of departmental universities of the Ministry of Emergency Situations of Russia devoted to the study of the theory of combustion and explosions and the application of these theoretical foundations in the practice of a specific city farmer. For example, the academic discipline “Theory of Combustion and Explosion” of the Ural Institute of the State Fire Service of the Ministry of Emergency Situations of Russia presents materials on the basics of the combustion process, including information on the necessary and sufficient conditions for the combustion process; calculations of air volumes and volumes of combustion products, determination of the composition of combustion products and the heat of combustion of substances in different states of aggregation; characteristics of maximum permissible explosive concentrations, as well as concentrations of reaction participants at which extreme values of fire safety parameters are observed (autoignition temperature of vapor-gas mixtures, etc.). Taking into account the above, it seems appropriate to us to convey the designated information to potential consumers - future volunteers in the field of city farming.

The most effective way for representatives of the unorganized part of the youth, who actively use the Internet for self-realization, to acquire the listed knowledge is the technology of creating an information space, which in its parameters corresponds to the practice of search and cognitive activity of a potential user. In order to outline the contours of such a space, we used a dialogue with students studying at the Faculty of Management and Integrated Security of the Ural Institute of the State Fire Service of the Ministry of Emergency Situations of Russia. 65 students were interviewed. It was found that all 100% of respondents turn to the Internet as a means of time management and a way of self-correction for the purpose of rest and restoration of working capacity. All respondents use the Yandex platform for this and half of them additionally use the social networks “Vkontakte”. The overwhelming majority use mobile phones to achieve these goals, only two (3.1%) have the opportunity and prefer to listen to the fragments they are interested in using a stationary computer and stereo sound. At the same time, almost a third of respondents (36.9%) expressed their desire to listen to fragments in stereo format. Respondents listen to fragments in a wide range of their activities, “from morning to night”: eating, walking, traveling by transport, during work, training, reading, studying, resting and even sleeping. At the same time, only one third of respondents (32.3%) are virtually online during study, reading and training.

Conclusions. The vulnerability of the population in the context of increasing environmental threats is increasing. The cohort of city farmers, previously absent from society, is becoming a risk group. As environmental volunteers, city farm-

ers carry out their activities in various forms, among which self-organization and network exchange of information among interested Internet users dominate. A sociological survey of students of a departmental university showed that no more than one third of respondents practice active presence in the virtual space of the Internet during their studies and training. Thus, a discrepancy was found between the sociology of communication and the algorithms for staying in the virtual space of people who need information on fire safety in city farming and people who have this information due to their chosen profession.

Conclusion. Given the lack of sufficient information on social networks about the rules of safe behavior and fire safety for city farmers, it is necessary to intensify the interaction of firefighters and rescuers with this category of the population. For effective communication, the communication format that is typical for city farmers as a group of environmental volunteers is preferable, namely, in the form of communication in the digital space, in the “peer to peer” format, with the active use of social networks popular among target groups of the population. An analysis of the behavior algorithms in the digital environment of students of the Institute of the Ministry of Emergency Situations of Russia showed that future firefighters and rescuers are not fully prepared for successful work with the civilian population in the modern digital environment.

It is proposed that through the joint efforts of experts in the field of fire safety, organizers of the educational process and specialists in the field of social communication, this gap be eliminated and effective methods of digital training of environmental volunteers and city farmers in the basics of safely creating an artificial microclimate in individual adapted premises be developed.

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上海合作组织框架下塔中科技教育合作
**TAJIK-CHINESE COOPERATION IN SCIENCE
AND EDUCATION SPHERES WITHIN THE FRAMEWORK OF THE
SHANGHAI COOPERATION ORGANIZATION**

Gaffori Numonjon Usmonzoda

*Doctor of Historical Sciences, Professor, Head of Department
Tajik State University of Law, Business, and Politics*

Khamidzoda Furkat Mukim

*Doctor of Historical Sciences, Professor, Head of Department
Tajik State University of Law, Business, and Politics*

Khamidova Manzura Makhmudovna

*Candidate of Historical Sciences, Associate Professor,
Head of Department
State University of Law, Business, and Politics*

摘要.本文介绍了塔吉克斯坦与中国在上海合作组织框架下在科教领域的合作情况,并阐述了促进科教领域合作的主要因素和事实。文章特别强调了塔吉克斯坦国立政治经济法学院作为上海合作组织成员国之一的重要性。

作者认为,塔吉克斯坦与中国的合作是增进睦邻友好、促进相互理解、推动科教领域发展、巩固人民友谊的关键。

关键词: 合作、塔吉克斯坦、中国、上海合作组织、塔吉克斯坦国立政治经济法学院。

Abstract. In the article, the authors present information about Tajik-Chinese cooperation in the field of science and education within the SCO and express their opinion on the main factors and facts that contributed to cooperation in the field of science and education, a special place is given to the Tajik State University of Law, Business and Politics, as one of the participating universities within the SCO.

The authors consider the issue of cooperation between Tajikistan and China as the key to friendship and good neighborliness, mutual understanding, and development in the field of science and education, strengthening friendship between peoples.

Keywords: cooperation, Tajikistan, China, Shanghai Cooperation Organization, Tajik State University of Law, Business and Politics.

Chinese-Tajik friendship and cooperation has its roots from very ancient period of history. About two thousand years ago, a representative of the Chinese Han Dynasty Zhang Qian was sent as an ambassador to the western lands, which was the beginning of friendly relations between the Chinese people and the peoples of the Central Asian countries, including the Tajik people. More than a thousand years ago, the ancient “Silk Road” has already become a bridge of friendship between the Chinese and Tajik peoples. After declaring its independence by Tajikistan China became one of the first countries that established diplomatic relations with our republic in January 1992 and exchanged ambassadors. Today Tajik-Chinese relations occupy one of the central places in the foreign policy of Tajikistan. As the Leader of Nation, President of the Republic of Tajikistan Emomali Rahmon has repeatedly stated, the development of good-neighborly relations, friendship, partnership and cooperation with the People’s Republic of China has been, and for today and in future will be the most important priority for Tajikistan..[1, 45]

We have a proverb: “A close neighbor is better than a distant relative”. This is the most appropriate definition of the development of Chinese-Tajik relations. After gaining independence, Tajikistan faced with a five-year civil war (1992-1997). During this most difficult period, the PRC embassy continued its work in our region. On March 9, 1993, in Beijing, the Chairman of the Supreme Council of Tajikistan Emomali Rakhmonov and the Chairman of the PRC Yang Shankun signed a joint Declaration on the Basic Principles of Relations between the Republic of Tajikistan and the People’s Republic of China, on which the entire complex of bilateral interaction was built in the following years.

Relations with the great neighbor as China is the most important vector of the foreign policy of the Republic of Tajikistan. In September 1917, the Chairman of China Xi Jinping visited Tajikistan for the first time, noting that “Tajikistan and China are close, friendly neighbors and highly reliable strategic partners. China is ready to work with Tajikistan to use bilateral relations as an opportunity to promote deepened development of bilateral cooperation.” [4, 9].

Chinese-Tajik friendship, have stood the test of time and becoming stronger than before. After gaining independence, the Republic of Tajikistan actively cooperates with the People’s Republic of China in the field of science and education. Scientific and educational exchanges between China and Tajikistan are becoming more active day by day. The numbers of universities in Tajikistan where Chinese language is teaching and specialty of Chinese language were opened are increasing year by year. The number of Tajik students studying in China, using Chinese government scholarships, is also gradually increasing.

It should be noted that over the years of independence, the following inter-governmental and interdepartmental regulatory acts in the field of science and education have been signed and adopted:

- On September 16, 1996, in Beijing, an Agreement on Cooperation in the Field of Education was signed between the Ministry of Education of the Republic of Tajikistan and the State Education Committee of the People's Republic of China;

- On February 1, 2002, an Agreement was signed between the Ministry of Education of the Republic of Tajikistan and the Ministry of Education of the People's Republic of China on cooperation in the field of education;

- On January 15, 2007, an additional protocol to the Agreement between the Ministry of Education of the Republic of Tajikistan and the People's Republic of China in the field of education was adopted;

- On September 13, 2014, an Agreement was signed between the Ministry of Education and Science of the Republic of Tajikistan and the Headquarters of the Confucius Institute on cooperation in the construction of the Confucius Center;

- On August 31 2017, a Memorandum was signed between the Government of the Republic of Tajikistan and the Government of the People's Republic of China on the establishment of the Commission of Tajikistan and China on scientific and technical cooperation;

The foundation of Tajik-Chinese cooperation in science and education was laid in March 1993 during the first meeting of the leaders of the Republic of Tajikistan and the People's Republic of China. Following this meeting, a Joint Declaration on the Basic Principles of Relations between the Republic of Tajikistan and the People's Republic of China was signed. It reflected the desire of both sides "to promote the expansion of cooperation between the two countries in such areas as science, technology and education..." [3, 139-140].

By the invitation of the School of Humanities and Law of the China University of Petroleum in Qingdao city of People's Republic of China, from July 12 to 22, 2024, Professor of the Department of Social Sciences of the Tajik State University of Law, Business and Politics Abdurahim Juraev traveled to China to deliver a series of lectures to master's degree students studying in the specialty "Chinese language" of the mentioned university. This trip was coordinated with the Ministry of Education and Science of the Republic of Tajikistan, and organized by the Confucius Institute at the Mining and Metallurgical Institute of Tajikistan, with which the Tajik State University of Law, Business and Politics has long-standing, friendly and partnership ties.

It should be noted that the Confucius Institute at the Mining and Metallurgical Institute of Tajikistan, headed by Mr. Jen, during its work contributed to a fairly intensive expansion of forms of cooperation and deepening of ties between educational institutions of China and Tajikistan. The invitation of a Tajik professor to deliver lectures to students at one of the universities of the People's Republic of China is a significant event in the intercultural relations of these countries.

Professor of Tajik State University of Law, Business and Politics in Khujand Abdurahim Juraev mentioned that Tajikistan and China have great potential for expanding and deepening cooperation in all areas.

Professor A. Juraev in an interview with Xinhua mentioned that “China is one of Tajikistan’s strategic partners. Previous experience of cooperation shows that we have real opportunities to strengthen our cooperation in all areas - in the economy, social and humanitarian spheres,” The Chinese initiative “Belt and Road”, according to the professor of the Tajik University, brings benefits to all countries involved in it. This fully applies to Tajikistan. The upcoming visit of the Chinese leader, according to the professor, will give a new impetus to cooperation between the two countries and will contribute to the stabilization of the situation in Central Asia.

According to professor A. Juraev, in recent years, interest in China and studying the Chinese experience of modernization, Chinese culture and language has noticeably increased in Tajikistan. Today the Chinese language are studied in almost all universities of Tajikistan. “Chinese modernization is different from Western modernization, it is unique, and it is based on its own traditions. China has shown that relying on its own experience, it is possible to create modernity,” said Professor A. Juraev. In his opinion, the cultures of China and Tajikistan have much in common, the traditional values of the two peoples are very close, and this creates a solid foundation for mutual understanding and the development of interaction between the two countries. [6].

Close cooperation has also been established and about 30 regulatory documents have been signed between the National Academy of Sciences of Tajikistan (NAST) and the Academy of Social Sciences and other research institutes of the People’s Republic of China, in particular the Memorandum of Understanding on Chinese-Tajik scientific cooperation, signed on June 17, 2006 in Urumqi, the Memorandum of Cooperation between NAST and the Chinese Academy of Social Sciences, signed on May 13, 2013 in Beijing, the Memorandum between the Academy of Sciences of the Republic of Tajikistan and the Ministry of Science and Technology of the PRC on the formation of a commission on scientific and technological cooperation, signed on August 31, 2017. [4, 211].

It should be noted that Tajik students are becoming an increasingly visible phenomenon in China and are an important link in strengthening the traditional ties of friendship and cooperation between the two countries, and presenter of Tajik culture and art in the host country. Since 1993, the Chinese government has been providing state scholarships to Tajik students every year, the number of which is increasing year by year.

Thanks to established contacts between the relevant structures of Tajikistan and China, today more than 3 thousand Tajik students are studying in more than

112 different universities in China. Beside this Chinese language departments have been opened in universities in the Republic of Tajikistan. [4, 208].

It is well known that the emergence of the Shanghai Cooperation Organization (SCO) in the Eurasian space in 2001, which is a complex structure covering the most diverse aspects of politics, security, economics, culture, humanitarian relations, etc., has transformed into a major pole of world politics with enormous human and economic resources. The SCO began its work with ensuring security in border areas and gradually moved on to combating terrorism, economic cooperation, environmental protection, humanitarian cooperation, etc. This organization which gradually expanding the scope of its activities, pays special attention to regional cooperation in the field of science and education.

Today Tajikistan and China have deepened cooperation within the SCO and both countries actively promoting bilateral cooperation in science and education. For example our university, the Tajik State University of Law, Business and Politics, also has experience in participating in the creation of the SCO University in 2011. This is the result of a decision taken by states within the SCO, which includes leading universities from Russia, China, Kazakhstan, Kyrgyzstan and Tajikistan and includes more than 60 universities.

Back in 2009, by order of the Ministry of Education of the Republic of Tajikistan, among a number of other higher educational institutions of the country, TSUPBP was included in the list of universities for cooperation within the framework of the SCO University. The main direction of its activity within the framework of the international partnership of SCO universities was determined to be “Regional Studies”. It should be noted that our university has a research and educational center of the SCO University, headed by Doctor of Economics, Professor Alijon Boymatov.

The partners of TSUPBP within the framework of the SCO’s university are:

- Altai State University;
- Bishkek Humanitarian University;
- Kyrgyz State University named after Balasagyn;
- Pavlodar State University;
- Ural Federal University named after the First President of the Republic of the Federation B.N. Yeltsin;
- Russian-Tajik Slavic University;
- Tajik State University of Languages named after S. Ulugzoda.

The aim of cooperation between the above-mentioned universities is to train highly qualified specialists through the exchange of master’s degree students between universities of the SCO member states. For example, Altai State University and Ural Federal University allocated 17 quotas for graduates of our university for the period 2014-2018 for study in the master’s program in the fields of “Regional Studies”, “Economics” and “IT Technologies” [5, 131-132].

In conclusion we can mention once more that the Republic of Tajikistan and the People's Republic of China are actively cooperating in the field of science and education. Cooperation between Tajikistan and China within the SCO framework still has broad opportunities and potential for the development of mutually beneficial cooperation in the field of science and education.

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美术职业教育中的课程体系优化研究
**OPTIMIZING THE CURRICULUM SYSTEM IN VOCATIONAL
ART EDUCATION**

Lyu Si Chen

Postgraduate Student

Belarusian State University, Minsk, Belarus

Lu Wei

Postgraduate Student

Belarusian State University, Minsk, Belarus

摘要.为了应对快速变化的艺术行业并满足对高技能专业人才的需求，职业艺术教育中一套强大且动态的课程体系至关重要。本文探讨了职业艺术教育项目目前面临的挑战，并提出了针对课程体系改革的针对性策略。通过整合实践培训、加强行业合作以及采用创新教学方法，职业艺术教育能够培养出现代艺术市场所需的更优质技能。

关键词：职业艺术教育；课程优化；实践培训；创新教学方法

Abstract. *In order to meet the rapidly changing art industry and increase the demand of skilled professionals, a curriculum system that is strong yet dynamic is vital in vocational art education. Such challenges that vocational art programs are encountering are discussed in this paper, and targeted strategy approaches to reform the curriculum system are proposed. Vocational art education through integrating practical training, collaborating with industry and innovative teaching methods can imbibe better skills which are needed by the modern art market.*

Keywords: *Vocational Art Education, Curriculum Optimization, Practical Training, Innovative Teaching Methods.*

I. Introduction

Vocational art education is a key conduit into the art industry by students hoping to work in the industry. Nevertheless, conventional curriculum systems frequently lag in equipping students with the wanted capabilities and data they require to fortify in a quick altering and aggressive field. Recent research points to the necessity for a smarter and thus more integrated approach to curriculum design. For instance, Liu (2024) proposes a curriculum content change to fit art design career paths, or; He (2023) promotes the change of teaching modes to im-

prove practical skills. The contribution of this paper is to build on these insights to propose a complete framework for curriculum optimization.

II. Current Challenges in Vocational Art Education

A Disconnection Between Theory and Practice

One problem that is prevalent in many vocational art programs is a leaning toward too much theoretical knowledge and too little practical skill. And students generally graduate with good theoretical foundation but little practical experience sought by employers. The lack of real world projects and industry based assessments in the curriculum makes this gap worse. Lin (2023) noted however that without practical training, the gap is bridged and students will not be able to find jobs from when they graduate.

B Limited Industry Engagement

It is important to have effective collaboration with the art industry to gain students' exposure to what is happening in the market now, and the professional standards. Nevertheless, most of the vocational institutions have very few associations with the art companies and organizations. Lacking engagement, students are cut off from internships, guest lectures, and collaborative projects which play a key part in their professional development. Less than 40% of vocational art schools, according to a survey by the Art Industry Alliance (2021), have yet to establish long-term partnerships with local businesses so that there is an even greater requirement for stronger industry ties.

C. Outdated Curriculum Content

As the art industry is one marked by rapid technological advancements and changing aesthetic standards, it is clear that delivering on the promise of a museum such as Pending Art Museum requires collaboration between design and engineering. Yet, many vocational art curricula do not adapt to these changes, thus lacking the most recent course content. For example, the art field is using, or rapidly needs to use, the kinds of technologies such as virtual reality (VR), to augmented reality (AR) that used to be 'side technology' and they are generally not in the curricular. At the same time, contemporary art practices and interdisciplinary approaches are not present to the extent that they should be for the students' ability to enhance and adapt to new challenges.

III Strategies for Curriculum Optimization

A Enhancing Practical Skills

The reason why theory and practice are so disconnected is because vocational art programs should focus more on hands on training and real-world projects. It can be done by integrating the studio-based courses, workshops and internships. For example, the college of Rhode Island School of Design (RISD) has used towards keenly implemented a curriculum that blends theoretical knowledge with abundant practical experience. The ideal scenario here is that the engagement between students at RISD and local businesses continues RISD students, after all,

become ready to use their skills in real world contexts and get a sense of what is ahead in the industry.

B Strengthening Industry Collaboration

In order to improve the relevance of and efficacy in the provision of vocational art education from the art industry's perspective, it is crucial for building good partnerships with art industry. Art companies, galleries, and other organizations, should regularly turn to educational institutions to offer workshops and skills exchange programs for the students, as well as internships and project-based learning programs for the students. For example, He (2023) proposes a "dual-studio system" of bridging the gap between learning in the institute and industry needs through school-enterprise cooperative studios as well as professional foundation studios.

C Updating Curriculum Content

The curriculum should be updated on a regular basis, including the latest trend and technology of art industry. It involves close integration of modules on emerging technologies like VR and AR and the creativity of contemporary art and its practices and methods. Moreover, the soft skills like critical thinking and problem solving, and communication need to be developed in the curriculum that is necessary for succeeding in the modern workplace.

IV. Conclusion

The optimization of the curriculum system in vocational art education is critical for the student's future career in the business sector of the art industry. Educational institutions can provide students with a well-rounded and relevant education for modern art market working conditions, by upgrading curriculum content, improving practical skills, and promoting collaborations in the industry. Other lines of research should be pursued in terms of implementation of these criteria and their effect on student outcomes and industry satisfaction. Finally, a curriculum system that is responsive and dynamic is necessary to promote innovation, and the long-term success of the vocational art education.

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纹样密码——广东省少数民族文化的传承与创新之路
**PATTERN CIPHERS: THE PATH OF HERITAGE AND
INNOVATION FOR ETHNIC MINORITY CULTURES IN
GUANGDONG PROVINCE**

Liang Zhengmin

Postgraduate student

Vladivostok State University, Russia;

Lecturer

*Guangdong Polytechnic Institute of Water Resources and Electric
Engineering, Guangzhou, China*

摘要.广东省少数民族纹样是民族文化认同的重要载体,其符号体系承载着历史记忆、族群边界与精神信仰。本文选取世居少数民族:瑶族、壮族、畲族纹样为研究对象,结合符号学、人类学理论,通过深度访谈、参与式观察等田野调查方法,分析纹样作为“文化密码”的内涵与功能。研究发现,广东省通过教育传承、产业创新与数字化保护等路径实现纹样活化,但仍面临文化失真、主体性缺失等挑战。提出构建“纹样伦理”规范、赋能社区主体、跨区域联动等对策,为平衡文化本真性与时代适应性提供实践参考。

关键词: 广东省少数民族纹样; 民族认同; 文化密码; 活化路径

Abstract. *The decorative motifs of ethnic minorities in Guangdong Province serve as vital carriers of cultural identity, with their symbolic systems embodying historical memory, ethnic boundaries, and spiritual beliefs. This study focuses on the motifs of indigenous ethnic groups—the Yao, Zhuang, and She—integrating semiotics and anthropological theories with field research methods such as in-depth interviews and participatory observation to analyze the intrinsic meanings and functions of motifs as “cultural ciphers.” The findings reveal that Guangdong has revitalized these motifs through educational inheritance, industrial innovation, and digital preservation, yet challenges persist, including cultural distortion and the erosion of agency. Proposed countermeasures include establishing “pattern ethics” guidelines, empowering community stakeholders, and fostering cross-regional collaboration, offering practical insights for balancing cultural authenticity and contemporary adaptability.*

Keywords: *Ethnic minority motifs in Guangdong Province; cultural identity; cultural ciphers; activation pathways.*

1. Introduction

As one of China's economic powerhouses, Guangdong Province has accumulated rich Lingnan historical and cultural resources through its role in the Maritime Silk Road and the convergence of diverse ethnic groups, forming a unique and multifaceted cultural landscape. The ecological development of its ethnic minority cultures exhibits distinctive research value characterized by the "Baiyue Primordial – Central Plains Integration – Modern Reconstruction" framework. Indigenous ethnic groups such as the Zhuang, Yao, and She have shaped a composite ethnic structure, where settled communities form the cultural core, and mobile groups act as dynamic elements. Over centuries, these indigenous minorities have created unique cultural traditions, particularly exemplified by the motifs adorning clothing, architecture, and artifacts. These motifs transcend mere artistic expression, functioning as vivid "wordless historical texts" that document collective memories, belief systems, and social structures, thereby serving as "cultural ciphers" that sustain ethnic identity. However, under the dual pressures of globalization and modernization, intensified interethnic interactions and shifting social environments have led to declining cognitive engagement of youth with traditional symbols, precipitating crises such as cultural identity erosion. In this context, investigating the inheritance and innovation of ethnic minority motifs in Guangdong holds significant theoretical importance for cultural preservation and offers actionable strategies to advance regional cultural development and reinforce ethnic cohesion.

This study adopts an interdisciplinary approach, integrating theories from ethnology, cultural studies, and design, while synthesizing perspectives on intangible cultural heritage preservation, cultural identity, and regional development to decode the "cultural ciphers" embedded in Guangdong's ethnic minority motifs. First, it deciphers the motif system's symbolic architecture, tracing historical roots and semiotic meanings. Second, it maps innovative pathways for motif revitalization. Finally, it confronts contemporary challenges and proposes targeted solutions. Distinct from prior research, this paper pioneers the concept of "pattern ethics" and constructs a cross-regional collaboration mechanism, aiming to provide theoretical and practical frameworks for the sustainable inheritance and innovation of Guangdong's ethnic minority cultures.

2. Cultural Connotations and Symbolic Functions of Ethnic Minority Motifs

2.1 Motifs as Living Archives of Ethnic History

Motifs serve as "ciphers of historical eras," encapsulating collective memories, belief systems, and social structures while chronicling the emergence, evolution, expansion, and deepening of ethnic cultures. In Guangdong's ethnic minority motifs, the Yao's Panwang Seal, the Zhuang's Zhuang Brocade, and the She's Phoe-

nix Totem stand as iconic examples, their symbolic systems deeply intertwined with historical narratives. For instance, the Yao's octagonal floral pattern in traditional attire symbolizes the arduous migratory journeys of their ancestors. Each angle of the octagon embodies a chapter of migration, reflecting the resilience and continuity of the Yao people. Passed down through generations, this motif has become a historical anchor, preserving the Yao's collective memory even in the absence of written records, allowing descendants to trace their ancestors' struggles through its intricate design^[1]. Similarly, the Zhuang's frog motif, rooted in ancient rice-farming culture, emerged from the reproductive symbolism of frogs in agrarian societies. This motif not only embodies the Zhuang's philosophy of harmony with nature but also serves as a living testament to the evolution of their agricultural heritage. These motifs, functioning as "wordless chronicles," bridge past and present, ensuring the vitality of ethnic histories.

2.2 Motifs as Boundary Markers of Identity

In the context of globalization, where cultural exchange and collision intensify, motifs play a pivotal role in constructing cultural boundaries and reinforcing identity. Take the Liannan Yao as an example: distinct subgroups such as the Guoshan Yao and Pai Yao exhibit striking differences in their attire motifs. The Guoshan Yao motifs feature vibrant colors and intricate embroidery, showcasing a complex aesthetic, while the Pai Yao prioritize minimalist lines and subdued palettes. These visual distinctions act as identifiers, enabling Yao individuals to discern "in-group" from "out-group"^[2]. In multicultural interactions, such differences not only strengthen internal cohesion among subgroups but also highlight the Yao's unique cultural identity as a unified ethnic entity, allowing them to maintain cultural distinctiveness amid broader interethnic exchanges.

2.3 Motifs as Embodiments of Beliefs and Cosmology

Ethnic minority motifs often intertwine with primal religions and nature worship, externalizing collective beliefs and cosmological views. The Yao's dog-head crown motif, derived from the Panhu mythos, embodies their reverence for the canine totem. This belief transcends spirituality, materializing through the motif's presence in daily attire and ritual practices, thereby anchoring faith in tangible cultural expressions. Similarly, the She's Phoenix Costume motif alludes to the sacred narrative of "phoenix-guided migration" during ancestral journeys^[3]. In She tradition, the phoenix symbolizes auspiciousness and beauty, with the motif serving as a conduit for ancestral reverence and aspirations for prosperity. By concretizing abstract beliefs into wearable art, these motifs become material carriers of spiritual worlds, profoundly reflecting the She's cosmology and cultural values.

3. Practical Pathways for Activating Ethnic Minority Motifs in Guangdong

3.1 Educational Inheritance: Cultural Relay from Classroom to Practice

Higher education institutions in Guangdong's Vocational Education City have actively responded to the call for intangible cultural heritage (ICH) preservation by integrating Yao motifs into disciplines such as design and ethnology through the "ICH in Campus" initiative, cultivating professionals for cultural transmission. For example, Qingyuan Polytechnic College offers an elective course on Yao Embroidery Techniques, inviting local ICH inheritors to teach traditional skills and motif knowledge. Students replicate classical motifs while innovating modern designs, thereby bridging traditional craftsmanship with contemporary aesthetics^[4]. Additionally, universities collaborate with local governments to establish Yao Cultural Practice Bases, organizing fieldwork for students to collect motifs, digitize archives, and observe the application of motifs in Yao communities. These immersive experiences not only enhance technical mastery but also foster cultural identity and responsibility, nurturing a new generation of talents skilled in both tradition and innovation, thus achieving a seamless "cultural relay" from theory to practice.

3.2 Industrial Innovation: Creative Transformation of Motif Value

Guangdong's Ethnic Cultural Creative Industry Association has spearheaded the IP-based development of ethnic motifs. For instance, Liannan Yao embroidery motifs have been adapted into designs for bags, home décor, and other cultural products, blending aesthetic uniqueness with Yao cultural memory. These products, generating annual revenues exceeding 100 million RMB, exemplify the shift from traditional handicrafts to market-driven commodities, meeting demand for culturally rich goods while expanding cultural outreach. In cultural tourism, initiatives like the Lianshan Zhuang "Water-Splashing Festival" integrate Zhuang brocade motifs into festive visuals, creating "motif + experience" tours where visitors engage in motif painting and costume-making, deepening their understanding of Zhuang culture^[5]. Meanwhile, Ruyuan Yao villages leverage technology through motif-themed light shows and AR-guided tours, transforming static motifs into dynamic cultural IPs. Such innovations enhance tourist engagement, merge tradition with modern consumption, and drive synergistic growth of culture and economy.

3.3 Digital Preservation: Constructing a Motif Gene Bank

Advanced technologies like 3D scanning and AI recognition have revolutionized motif preservation. The Guangdong Ethnic and Religious Research Institute has digitized representative Yao and Zhuang motifs, establishing the Lingnan Ethnic Motif Database. This open-access resource supports academic research and empowers designers to innovate through shared cultural assets. Furthermore,

short-video platforms like Douyin and Kuaishou have amplified motif dissemination. Campaigns such as #YaoxiuChallenge (Yao Embroidery Challenge) have transformed motifs from static symbols into viral cultural phenomena, attracting youth participation and expanding the reach of ethnic heritage. By merging digital archiving with viral marketing, Guangdong ensures both the preservation and contemporary relevance of its ethnic motifs.

4. Challenges and Countermeasures: Dilemmas and Breakthroughs in Motif Inheritance

4.1 Current Challenges

Under the dual pressures of globalization and marketization, the inheritance of ethnic minority motifs faces multifaceted challenges. First, excessive commercialization driven by internet trends has led to the deconstruction of symbolic meanings. For example, the Yao's Panwang Seal, a core symbol in ancestral worship and ethnic identity, is often reduced to a generic commercial logo in development projects, stripped of its original religious context, thereby diluting its cultural and spiritual significance. Such cultural distortion not only undermines the integrity and authenticity of ethnic cultures but also risks misguiding public understanding of traditions. Second, intergenerational transmission gaps are widening. Data reveals that the average age of Yao embroidery inheritors in Qingyuan exceeds 60, with only 12% of village youth mastering basic motif techniques. As elder inheritors pass away, unique motifs and craftsmanship face extinction. Younger generations, influenced by modern lifestyles, show dwindling interest and motivation to engage with traditional practices, exacerbating the crisis of agency loss. Third, fragmented collaboration mechanisms hinder effective development. Ambiguous roles among governments, enterprises, and communities, coupled with insufficient coordination, have led to conflicts—such as a cultural tourism project sparking ownership disputes due to corporate unilateralism without community consultation. Such practices not only fuel stakeholder tensions but also produce outcomes disconnected from cultural authenticity, lowering community acceptance and jeopardizing sustainable inheritance.

4.2 Proposed Solutions

To address these challenges, a three-pronged systemic protection mechanism—integrating institutional safeguards, community empowerment, and cross-regional synergy—is essential. First, strengthen institutional frameworks by establishing “pattern ethics” guidelines. The Guidelines for Ethnic Minority Motif Utilization should mandate the preservation of core symbols and cultural taboos in commercial projects, strictly regulating motifs tied to religious or ritual significance to prevent semantic distortion. Concurrently, enforce accountability mechanisms to penalize violations, ensuring systemic protection of cultural authenticity. Second, empower communities to revitalize endogenous agency. Launch

a “Motif Heritage Fund” to subsidize village-level “motif workshops”, providing tools and spaces for skill development. Encourage “motif cooperatives” where villagers engage in design, production, and sales, directly benefiting from economic returns via profit-sharing models^[7]. Supplement this with expert-led training to enhance technical proficiency and innovation, solidifying grassroots participation. Finally, foster cross-regional collaboration for resource integration. Leveraging the Belt and Road Initiative, coordinate Guangdong, Guangxi, and Hunan in joint efforts to nominate Yao motifs for UNESCO heritage status. This unified approach amplifies cultural resonance, elevates global visibility^[8], and establishes interregional platforms for knowledge exchange and cooperative innovation, ultimately creating a heritage paradigm of “shared cultural DNA and mutually reinforcing advantages.”

5. Conclusions and Prospects

As “cultural ciphers” of ethnic identity, the motifs of Guangdong’s ethnic minorities hold pivotal significance in cultural inheritance. They serve not only as vital carriers of historical memory but also as invaluable resources for contemporary innovation. In the era of globalization and modernization, preserving and revitalizing these motifs requires a delicate balance between cultural authenticity and temporal adaptability. On the one hand, educational initiatives and digital preservation effectively sustain the motifs’ cultural DNA, ensuring the continuity of their unique connotations. Educational programs cultivate new generations of inheritors, infusing fresh vitality into transmission efforts, while digital technologies enable permanent archival and widespread dissemination. On the other hand, creative industries and technological empowerment provide robust support for integrating motifs into modern life. Cultural product development and tourism integration propel motifs into global markets, enhancing both economic and cultural value, while digital innovations unlock novel avenues for display and engagement.

Looking ahead, Guangdong should further explore the multidimensional value of ethnic motifs in rural revitalization and cross-cultural dialogue. In rural development, leveraging motifs as cultural anchors can drive cultural industries, spurring economic growth in ethnic communities. In global exchanges, positioning motifs as emissaries of Chinese ethnic culture can showcase their aesthetic and symbolic richness to the world, offering the “Guangdong Experience”—a replicable model for sustaining cultural heritage within a globalized framework. By harmonizing tradition and innovation, Guangdong’s ethnic motifs will continue to illuminate pathways for cultural resilience, contributing to both local prosperity and the global discourse on multicultural coexistence.

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全球化时代中国文化代码的立体化转型
**THE TRANSFORMATION OF CHINESE CULTURAL CODES IN
THE ERA OF GLOBALIZATION**

Ling Tong

Postgraduate student

Vladivostok State University, Russia

摘要. 本文以全球化语境下的文化身份重构为脉络, 聚焦中国青年雕塑家的创作实践, 揭示当代艺术对传统文化代码的创造性转化逻辑, 论证中国传统文化在遭遇现代性冲击时并非被动消解, 而是通过符号解构、媒介实验与哲学转译形成新的表达系统。

关键词: 中国文化、文化代码、雕塑、文化交流

Abstract. *This paper traces the reconstruction of cultural identity in the context of globalization, focusing on the creative practices of young Chinese sculptors. It reveals the logic of contemporary art's transformative engagement with traditional cultural codes, demonstrating that Chinese traditional culture does not passively dissolve under the impact of modernity. Instead, it generates new expressive systems through symbolic deconstruction, medium experimentation, and philosophical reinterpretation.*

Keywords: *Chinese culture, cultural codes, sculpture, cultural exchange.*

Introduction

As an art form that transcends cultural boundaries, sculpture possesses the dual capacity to embody the traditional cultural characteristics of its creators while simultaneously engaging in deconstruction and reconstruction to address shared themes across cultures in the globalized context. Taking contemporary Chinese sculpture as a focal point, this paper examines the practices of young Chinese artists, exploring how they facilitate the transformation of cultural codes amid globalization. By preserving the core ethos of Eastern culture while articulating universal human concerns with greater clarity, these artists forge new modes of cultural narrative that resonate across diverse audiences.

Research Objectives and Aims

The primary objective of this study is to explore innovative approaches to disseminating traditional Chinese culture in the contemporary globalized context,

with a focus on how sculpture serves as a medium to convey the wisdom and cognitive frameworks inherent in Eastern culture. Through this lens, the study seeks to illuminate the processes by which cultural identity is constructed on a global scale.

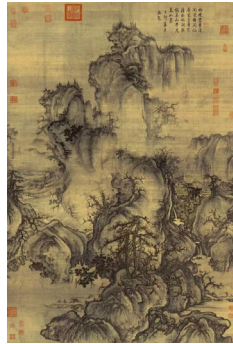
A key demographic of interest is Chinese artists born after 1975—a generation shaped by the internet era, rapid economic growth, and a society marked by coexisting forces of transformation and conservatism, chaos and reordering, widening wealth gaps, and emerging class stratification. The “contradictions” defining this generation reflect broader resonances of traditional Chinese culture in response to global developments.

To address these questions, the study adopts a four-dimensional analytical framework—identity positioning, economic foundations, interpersonal relationships, and linguistic culture—examining how young artists employ modern sculptural language, ranging from figurative realism to abstract expressionism, to articulate these core themes.

I. Identity and Spatial Coordinates

As a three-dimensional art form, sculpture is inherently defined by multi-perspective observation and comparison. From the dimension of art philosophy, the process of viewing sculpture engages not only visual perception but also implies the viewer’s reflection on and positioning of self-identity. This process can be abstracted into the philosophical inquiry of “Who am I? Where am I? Where am I going?”—where the “I” serves both as the viewer’s subjective perspective and as the origin point in spatial coordinates, forming the cognitive foundation for the viewer’s interaction with the world.

The “Three Distances” theory (三远法), proposed by Northern Song Dynasty painter Guo Xi (1023–c. 1085) in his theoretical work *Lofty Ambitions in Forests and Streams* (Lin Quan Gao Zhi), provides a crucial theoretical framework for this multi-perspective observation model. The “Three Distances” is not merely a compositional technique for landscape painting but, more fundamentally, a cognitive paradigm based on shifts in spatial positioning. Specifically, it reveals how differing viewpoints—“high distance” (仰视, upward gaze from below), “deep distance” (俯视, downward gaze from front to back), and “level distance” (平视, horizontal gaze from near to far)—generate distinct perceptions and understandings of the same scene. This multi-angled observation and synthetic comprehension embody traditional Chinese art’s profound contemplation of the relationship between space and cognition.



“Early Spring”

158.3 cm × 108.1 cm Collection of the National Palace Museum, Taipei

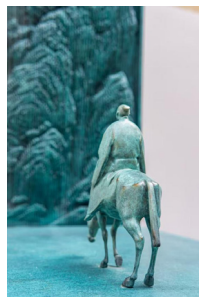
Image Source: <https://mp.weixin.qq.com/s/5wctJrfmZI86U2XB05Xg9g>

“The mountain” as a cultural code serves as a metaphor for all things. Zhang Xinyu’s sculpture **Seeing the Mountain as Mountain Again** takes “mountain viewing” as its theme, reshaping the artistic conception of traditional Chinese landscape painting in sculptural form. It demonstrates the philosophical reflection of “seeing the mountain as a mountain, seeing the mountain as not a mountain, and seeing the mountain as still a mountain.” By presenting “mountain viewing” from different positions and periods, it metaphorically suggests that people gain different understandings of the world when viewed from different dimensions.

In Chinese landscape painting, artists use brushstrokes to create mountain details like rocks and trees through layered ink washes on paper. Zhang Xinyu reconstructs the form and characteristics of mountains using metal slices, giving the sculpture a visual effect resembling dynamic ink flow. This not only expands traditional sculptural language but also puts modernist artistic concepts into practice. The work primarily adopts a vertical rectangular composition, simulating the hanging scroll format of traditional Chinese landscape painting.

Chinese landscape paintings often use the motif of travelers as pictorial symbols to metaphorize the artist’s spirit and thoughts. In this context, the relationship between humans and mountains is not one of possession and conquest, but rather an attitude of yearning for freedom and worship of all natural things. Since the Tang Dynasty, in Eastern culture, humans are not considered the masters of all things in the world, but rather the crystallization of all things. Only when humans possess wisdom and virtue can they be defined as truly human—that is, what Confucianism refers to as the “junzi” (gentleman).

The *Analects of Confucius*¹ states: “The wise find joy in mountains,” meaning that people with wisdom and virtue will be as steadfast as mountains, unshaken by wind and rain. From the perspective of cultural geography, this metaphor reflects the inherent pursuit of stability in traditional Chinese agricultural civilization. Chinese civilization originated in the floodplains of major rivers, where seasonal flooding and course changes brought uncertainty. This dynamic characteristic of the natural environment fostered a socio-cultural psychology that revered stability. The imagery of mountains here is endowed with an enduring symbolic meaning, representing constancy and order, aligning with agrarian society’s reverence for natural laws and the need for stable production and life. This cultural psychology is further manifested in the construction of knowledge systems such as ancient Chinese calendars, astronomical observations, and spatial coordinates—all of which focus on pursuing the stability of natural laws, embodying cultural identification with and philosophical interpretation of the “mountain” as a symbolic code.



Zhang Xinyu «Seeing Mountains as Mountains Again»

Image source: <https://mp.weixin.qq.com/s/Ci9PvRpI8lAY7yOxqfh9IQ>

II. Survival and Belief

Totems and deities represent humanity’s means of endowing sculptures with soul—as symbolic manifestations in human culture, they essentially embody our concrete expressions of worship and dependence on supernatural forces. From the perspective of cultural anthropology, this practice stems from humanity’s inability to control its own destiny and a profound fear of unknown powers.

Totems are typically associated with the origins, beliefs, and identity of clans or tribes, while deities represent a higher cosmic order and moral framework. Within natural and social environments, humans constantly face threats from

¹ The original text from The Analects (Yong Ye 6.23) reads:
“The wise delight in waters; the benevolent delight in mountains.
The wise are active; the benevolent are tranquil.
The wise find joy; the benevolent attain longevity.”

uncontrollable factors such as disease, disaster, and death. This sense of powerlessness over fate drives humanity to seek forces beyond its own capabilities. By attributing tangible forms and meanings to unknown powers, humans establish a sense of controllable order at the spiritual level to rationalize loss.

In Eastern secular societies, public worship of deities is often pragmatically oriented, with core motivations reducible to the pursuit of material wealth (e.g., prosperity) and the need for risk avoidance (e.g., warding off harm). Such devotional practices extend beyond folk customs to even ruling classes—for instance, emperors performed sacrificial rituals to pray for favorable weather, as political continuity relied fundamentally on agricultural stability.

Five Oxen and Plowing and Weaving, as artworks depicting China's ancient agrarian civilization, reflect traditional society's emphasis on economic foundations. From an art-sociological perspective, these works not only document agricultural and handicraft production but visually articulate the core values of farming civilization. Liu Yan's Primary Industry series examines the socioeconomic foundations of survival through totemic representations of farming, forestry, animal husbandry, and fishing. These works transcend mere documentation of material production to explore cultural vessels and their inherent ideologies, offering artistic insights into human-nature interactions and cultural transmission. By combining agricultural themes with ritual artifacts (such as food vessels, coffins, bi discs, and cong tubes) through realist techniques and exaggerated compositions, Liu creates highly symbolic sculptures. This artistic practice reveals profound connections between material production and cultural signs while employing innovative visual language to decode the complexities of cultural memory and social structures.

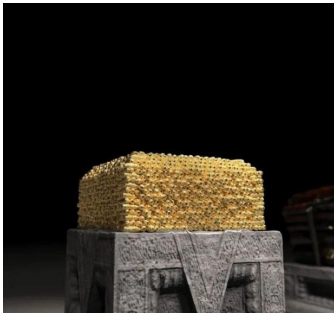


Figure 1. Agriculture, Food Vessel



Figure 2. Forestry, Coffin

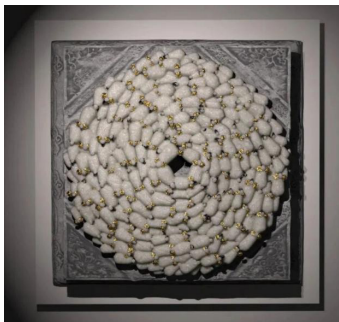


Figure 3. *Animal Husbandry, Bi Disc*



Figure 4. *Fishery, Cong Tube*

Liu Yan's "Primary Industry"

Image Source: <https://mp.weixin.qq.com/s/Sn7tydE6bAS8TSMWGfQagg>



Han Huang, Five Oxen

Image source: <https://mp.weixin.qq.com/s/brY5T9C5yeclzS8EhHNVXQ>

The author posits:

Figure 1: Liu Yan combines golden corn stacks with the form of ancient food vessels (lù), creating a metaphor for the profound connection between imperial power and agrarian civilization. This artistic approach not only demonstrates the polysemy of material and cultural symbols but also reveals the historical interplay between power symbols and agricultural production. As containers for imperial seals in antiquity, lù vessels held ritual significance in power transmission - a meaning amplified by the Ming Dynasty's royal monopoly on yellow pigment. By merging the golden hue of harvest (symbolizing both fertility and imperial authority in Chinese tradition) with the ceremonial vessel's form, the work materially fuses imperial symbolism with agricultural foundations, metaphorizing sovereignty's dual relationship of control over and dependence on farming civilization.

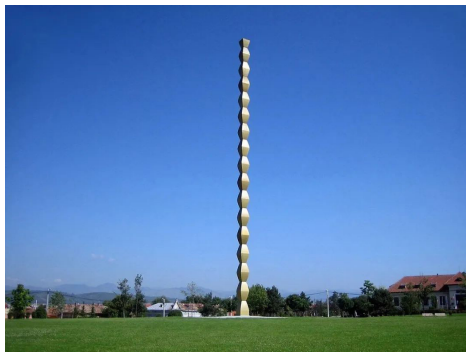
Figure 2: In Chinese culture, tall timber serves both as production material (e.g., construction wood) and life symbol. When fashioned into coffins, however, it transforms into an emblem of mortality. This duality positions timber as a medium connecting life and death, embodying the distinctive East Asian cyclical worldview. Liu arranges tree trunks into coffin-shaped installations, constructing

potent visual metaphors that not only suggest life-death interconnectedness but also confront cultural taboos surrounding mortality. The young artist deliberately makes this traditionally avoided subject unavoidable, transforming it into an intellectual imperative that reveals Chinese culture's complex death consciousness. This approach both challenges cultural conventions and offers fresh interpretive possibilities.

Figure 3: Pastoralism and Bi Disc. Chinese ritual tradition venerates heaven through white jade bi discs - their circular form embodying the "round heaven" cosmology, while the white jade symbolizes purity. Xinjiang's nephrite, prized for its luminous texture, became the preferred material, reflecting geographic-cultural interdependencies. Liu juxtaposes sheep's circular grazing patterns (concrete manifestation of pastoral cyclicality) with the static bi disc, creating a "natural movement (flock)-cultural symbol (disc)" correspondence. This visual language metaphorizes pastoral peoples' cosmological relationship, revealing the symbiosis between material production and spiritual practice while reasserting nomadic culture's unique position within Chinese civilization. The work deconstructs the "central plains-frontier" dichotomy, highlighting cultural syncretism.

Figure 4: Fishery and Cong Tube. The jade cong's square exterior and round interior correspond to the "round heaven, square earth" cosmology, with dark jade (e.g., black nephrite) intensifying earthly symbolism. Its segmented tiers manifest social hierarchy - more sections indicating higher status. Liu attaches fishing gear to the cong's surface, creating spatial dialogue between vertical power structures (cong tiers) and horizontal production networks (fishing implements). The exaggerated vertical reconstruction critiques how traditional ritual objects codified social stratification while revealing ecological dependencies. Interestingly, Brancusi's *Endless Column* shares formal similarities but embodies fundamentally different cultural logic: where Brancusi's modular repetition suggests eternal recurrence, Liu's "cong column" exposes hierarchy's rigidifying mechanisms under the guise of cosmic order.

In summary, Liu Yan's *Primary Industry* series constructs a sophisticated symbolic system that contemporaneously translates traditional cultural structures through formal and conceptual innovations. Beyond representing agriculture, forestry, pastoralism and fishery as material foundations, the works critically deconstruct Chinese civilization's inner logic through symbolic counterpoint and media experimentation. Notably, as a digital-native artist, Liu's fully computerized creative process mirrors 21st-century cognitive paradigms in cultural transmission.



Constantin Brâncuși's Endless Column

Image source: https://mp.weixin.qq.com/s/N3RRCErVSDcqmhfM_ukGpw

III. The Self and Others

The “differential mode of association” (差序格局), proposed by Fei Xiaotong in *From the Soil*, describes a Chinese social structure that contrasts with Western “organizational mode of association.” Centered on the individual, it forms concentric social networks based on blood and geographical ties, resembling ripples from a water droplet. This structure emphasizes fluid interpersonal boundaries, where each person serves as the epicenter of their relational universe, creating an interconnected society of countless overlapping circles—as seen in the “five degrees of mourning” system or the graduated gift-giving customs at weddings and funerals, where obligations diminish with relational distance.

Modern industrialization and urbanization have dismantled traditional rural communities, atomizing individuals into a society of strangers organized by professional specialization. Contractual relations have replaced interpersonal networks; “rational calculation” supersedes “differential ethics.” Contemporary urbanites find themselves stranded between worlds—unable to return to the warm networks of differential patterns yet struggling to find emotional belonging in organizational structures. This “distorted conflict” embodies the growing pains of civilizational transition: while physically inhabiting modern contractual society, the psyche remains partially anchored to traditional relational ethics. The resulting loneliness stems not merely from disconnectedness but from the internal 撕裂 between these two cultural DNA strands.

Loneliness remains an eternal emotional theme. In the early 20th century, Edward Hopper’s *Nighthawks* (1942) used pop colors and symbolic simplification to expose urban alienation. Set in a nocturnal diner, the painting’s tension arises from physical proximity versus psychological isolation—crossed gazes that never truly meet, epitomizing modern relationships’ non-connectivity. His *A Woman*

Reading a Letter further universalizes this into a timeless visual paradigm of modern solitude.

Today, young sculptor Fang Xu explores human connections through minimalist, symbolic forms. His works aim to capture “eternal emotions”—those shared empathetic resonances that transcend individuals. Through body language and spatial choreography (like the ambiguous proximity in *Half a Smile* or the *Between You and Me* series), his elongated, faceless figures examine relational fragility while mapping emotional entanglements. These works diagnose the fragmented relationships of the social media age yet simultaneously activate collective catharsis through universalized forms.

The modern Chinese philosopher Li Shutong proposed that human existence encompasses three dimensions of spiritual attainment, known as the “Three Insights of Life”²: Seeing Oneself, Seeing Heaven-and-Earth, and Seeing All Beings. “Seeing Oneself represents the awakening of the true self. Seeing Heaven-and-Earth defines one’s existential positioning. Seeing All Beings embodies the ideal of universal harmony.”

The concept of Seeing All Beings points toward transcending the self to achieve collective interconnectedness. Fang Xu’s artworks, through de-identifying forms (such as elongated human figures with blurred facial features) and spatial juxtaposition techniques (as seen in *Half a Smile*, where figures appear both detached and interconnected), construct metaphors of alienation and symbiosis.

This artistic expression not only reveals the fragmented nature of human relationships in the age of social media but also activates collective resonance through universalized symbolic imagery. By reconstructing warm emotional connections between individuals, it provides a spiritual anchor for atomized individuals—even in an absurd world, one can still recognize the shared meaning of coexistence.

² The theory of “Three Realizations in Life” is attributed either to the philosophical concepts and spiritual stages proposed by Li Shutong, or to *The Blue Cliff Record* (Biyuan Lu) written by Song Dynasty Zen master Yuanwu Keqin. However, neither attribution appears in original texts verbatim. Its core content gained widespread recognition through later compilations, internet dissemination, and references in cultural works.



Fang Xu Twin Flowers

Image source: <https://mp.weixin.qq.com/s/XFYMkxAXamn6BmIIqq7Eew>



Fang Xu Between You and Me Series

Image source: <https://mp.weixin.qq.com/s/0ISREu1Gts1dNXfDmoqCIQ>



Fang Xu Steadfast mountain NO.1

Image Source <https://mp.weixin.qq.com/s/UIWLJHGhbup-1K6pk3jKVw>



Fang Xu's Between You and Me Series

Image Source:
<https://mp.weixin.qq.com/s/pQP9J1yLmr3CUZBHYPtJcG>



Edward Hopper Nighthawks (1942)

Image source:
https://mp.weixin.qq.com/s/nUpjDliJtI_S5eaZlZwXw



Edward Hopper Girl Reading a Letter (c.1923)

Image source:
https://mp.weixin.qq.com/s/kSHkRC_1zNERbg7S9IumFw

IV. Civilization, Script, and Culture

The concept of “cultural conception of ethnicity” (种族文化观), proposed by Chen Yinke in *The Origins of Sui-Tang Institutions*, asserts that the criterion for distinguishing “ethnicity” lies not in “bloodline” but in “culture.” Culture forms the core and foundation of Chinese civilization, while Chinese characters serve as its outward expression and primary vehicle of transmission. History constitutes the lifeline of a nation’s culture and the coordinates of individual identity—cultural affiliation fundamentally determines one’s sense of self.

As the key medium of Chinese civilization’s continuity, Chinese characters were disseminated through woodblock and movable-type printing technologies, playing a pivotal role in cultural diffusion. The Song-typeface (宋体), in particular, is not merely an aesthetic achievement but also a model of functional typography. Its standardized glyphs and rigorous composition reflect generations of literati’s unrelenting pursuit of ritual propriety and moral ideals. Beyond propagating Chinese culture, Song-typeface actively participated in shaping the national character.

In 2025, young artist Ling Tong’s sculpture *Nation* (《国》) examines the relationship between individuals and culture. Taking the Chinese character “国” (“nation”) as its prototype, the work employs three-dimensional artistic techniques inspired by the formal development of Song-typeface in woodblock printing, achieving a composition of axial symmetry and stability. Utilizing modern laser-cut metal and welding technologies, the sculpture constructs the character “国” through countless hollowed-out Song-typeface characters from *The Hundred Family Surnames* (《百家姓》), interlocked via traditional mortise-and-tenon joinery. The strokes intersect spatially, embodying classical principles of symmetry and balance while integrating contemporary constructivist design logic.

The work synthesizes three cultural symbols:

The geometric precision of Song-typeface

The ritual form of the jade cong tube

The material contrast of “gold-inlaid-jade”

By deconstructing and reassembling *The Hundred Family Surnames*, the sculpture visually conveys Benedict Anderson’s concept of the “imagined community.” It reflects the evolving understanding of patriotism among contemporary youth—no longer reliant on figurative heroic narratives, but rather on the transformation of structure, abstraction, and cultural symbols to construct collective identity through abstract visual language. Like dismantling the concept of “the people” into a mosaic of countless surname fragments, the work metaphorizes the modern nation-state’s inherent logic of “individuals constituting the whole” through the deconstruction and recombination of Chinese characters. This mode of expression aligns with the decentralized cultural ethos of the digital age, converting grand narratives into interactive symbols—resulting in a modern abstract sculpture deeply rooted in traditional Chinese aesthetics.



Ling Tong, Nation

Image source: Provided by the artist

Conclusion

Young artists are transforming cultural symbols—from the landscape philosophy of agrarian civilization, to the differential ethics of patriarchal society, to ritual objects and written characters—into contemporary artistic language with distinct national characteristics. This transformation goes beyond superficial appropriation of symbols; rather, it reconstructs cultural cognition through sculptural practice. Within the global contest of cultural power, Chinese contemporary art is breaking free from the binary framework of “tradition versus modernity.” Ultimately, at the intersection of material and spiritual expression, it is reconstructing a cultural language that remains rooted in civilizational essence while achieving global legibility.

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教师个人和专业发展带来的专业相关性

PROFESSIONAL RELEVANCE AS A RESULT OF PERSONAL AND PROFESSIONAL DEVELOPMENT OF A TEACHER

Selyuch Marina Grigorievna

*Doctor of Psychological Sciences, Professor
Amur State University*

注释。教育数字化面临的新挑战在于构建、处理并将信息技术、策略和方法引入教育过程，从而构建最有效的知识互动流程。分析此前不存在且没有单一现成解决方案的复杂问题，需要采用不同的方法来利用来自不同领域的信息。为此，教师需要打破学科界限，创造超越学科思维的新的知识获取形式。数字化教育环境是开放、快速获取知识载体的基础。这反过来又要求探索新的有效技能、技术和工具，以研究教师在数字化教育环境中的主体性、其个体和个人特征，以及在众多专业活动和职业行为领域调动内部个人资源的能力。新的信息挑战使教师参与到变革的洪流中，影响个人和职业发展，并通过一套双方认可的职业和个人特征来确保其职业相关性。

关键词：个性、专业需求、对不确定性的容忍度、专业活动、教师、个人和专业发展、数字化教育环境。

Annotation. *New challenges related to the digitalization of education are aimed at structuring, processing and introducing information technologies, strategies and methods into the educational process, allowing to build the most effective process of interaction with knowledge. The analysis of complex issues that did not exist before and do not have a single ready-made solution requires different approaches to using information from many fields. To do this, the teacher needs to overcome the boundaries between academic disciplines, create new forms of knowledge acquisition that go beyond disciplinary thinking. The digital educational environment is the basis for open and fast access to knowledge carriers. This, in turn, dictates the search for new valid skills, technologies and tools for studying the subjectivity of a teacher in a digital educational environment, his individual and personal characteristics, the ability to mobilize internal personal resources in a huge number of areas of professional activity and professional behavior. New information challenges involve the teacher in the flow of changes, affecting personal and professional development, ensuring professional relevance through a set of mutually agreed professional and personal characteristics.*

Keywords: *personality, professional demand, tolerance to uncertainty, professional activity, teacher, personal and professional development, digital educational environment.*

Professional relevance as an integral psychological education reflects, on the one hand, the meaningfulness of professional activity, confidence in the professional future, and on the other hand, it affects the feeling of adaptability in the professional environment, revealing resources, allowing you to feel the vocation of evaluating the results of work and success on the part of all participants in the educational process, administrative authorities.

The professional relevance of the teacher is conditioned by the need to develop methods of psychological support for personal and professional development in the context of increasing demands on performance, the choice of an individual style of responding to changes and constant willingness to adapt to changes, uncertain situations and challenges, relying on such personal qualities as tolerance to uncertainty.

E. V. Kharitonova made a significant contribution to the development of this problem in line with the systemic paradigm [6, pp. 33-39], presenting this phenomenon as a meta-system of subjective relations of the teacher's personality to himself as a "significant professional for others." The professional relevance of a personality is described by a three-factor model, in the space of interaction between society, personality and profession, and including, respectively, social, personal and professional (activity) components, correlated with the spheres of self-realization of a personality. The higher the level of professional demand for a person, the higher the meaningfulness of life, the expression of basic beliefs, the parameters of resilience and self-attitude due to qualitative changes in the value-motivational profile with a predominance of the values of kindness, social usefulness, the desire to achieve social status, work orientation [6, pp. 319-323].

Achieving professional relevance reflects the professional position that a teacher takes in a digital educational environment, striving to achieve a higher level of professionalism as "climbing to oneself – the best" [3, p. 77], and awareness of one's own importance arises as a result of obtaining high-quality performance results, constant reconstruction of existing experience, the ability to adequately reflect professional situations, having mastered a new type of professional behavior. The concept of internal determination of personal and professional development as complementary and mutually beneficial processes by L. M. Mitina [2, p. 461] reveals the dependencies of their characteristics and serves as the basis for studying this scientific problem from a practical perspective. Close correlations should be considered the core of professional demand, emphasizing the conditionality of the teacher's professional activity and personality.

Empirically, using the questionnaire “Professional relevance of personality” (E. V. Kharitonova, A. B. Yasko) and the McLean uncertainty tolerance test on five scales modified by E. N. Osin, a close correlation has been established between the general level of professional relevance of a teacher as an integral characteristic of professional activity and the personal property tolerance to uncertainty of a teacher, revealing the desire for change, novelty and originality, willingness to go down untrodden paths and prefer more complex tasks, going beyond accepted limitations.

Based on the results obtained, three levels of professional demand for teachers were determined: (high — 32.6%; medium — 47.6%; low — 19.8%). 33.7% of respondents have a high tolerance for uncertainty, 37.3% have an average tolerance, and 29% have a low tolerance. A comparative analysis of the empirical data obtained on the levels of these characteristics allowed us to identify the specifics of the subjective relationship between professional demand and tolerance to uncertainty for each level that the subjects currently possess.

A larger number (47.6%) of the surveyed have an average overall level of demand, showing significant correlations with satisfaction with the realization of professional potential, awareness of belonging to the professional community. The low level (19.8%) indicates subjective dissatisfaction with the results of professional activity and self-esteem on the part of the teaching community. The lack of sufficient experience and knowledge of information and communication technologies affects the implementation of complex tasks related to the digitalization of the educational process.

32.6% of the total number of respondents highly appreciate the meaning and results of their professional activities and accept themselves as competent teachers. They are characterized by self-efficacy, adaptability, and behavioral effectiveness. These characteristics emphasize openness to partnership and mutually beneficial cooperation with colleagues, satisfaction with a positive assessment and recognition of results from all participants in the educational environment. Their emotional and value-based attitude to the profession allows them to consider it as service, selfless dedication, readiness for constant self-development, as well as an opportunity to increase personal effectiveness and career development.

Thus, the results of empirical research emphasize that a teacher in a digital educational environment attains relevance through subjective activity, creativity, a system of emotionally experienced meanings, tolerance to uncertainty as a personal trait and cognitive mode of action.

The introduction of digital resources into the educational process involves certain difficulties and new ways and algorithms of teacher activity. Tolerance to uncertainty as a personal quality “summarizes various aspects of an individual’s emotional and cognitive functioning, characterizing cognitive style, belief systems

and attitudes, interpersonal and social functioning and problem-solving behavior” [1, p. 49], by directing a creative search for alternative solutions, coping processes in solving professional problems caused by the unstructured and uncertain nature of the existing reality, which was previously absent in his experience. These thoughts lead us to search for algorithms for the professional activity of a teacher that would ensure his “relevance in a situation of interaction with uncertainty and willingness to construct subjective images of the future” [4, p. 341]. In analyzing the problem of achieving a higher level of professional demand in conditions of uncertainty, various aspects of the subjective attitude to the professional future come to the fore, ranging from confidence to an anxious state of perspective in an over-dynamic environment.

The study of professional relevance and tolerance to uncertainty showed significant correlations (at the level of statistical significance $p < 0.05$).

A high level of tolerance to uncertainty reflects the meaningfulness of a professional path, influences a sense of adaptability in a professional environment, reveals personal resources and creates confidence in a professional future.

Teachers with an average level of tolerance tend to perceive difficult professional tasks as a challenge with the anticipation of enjoying the process of solving them.

A significant part of teachers with a low level of tolerance find it difficult to tolerate uncertainty, trying to find as many supporters as possible among colleagues who regard digitalization as the destruction of the traditional education system, ignoring personal participation in scientific and methodological activities on changing educational didactics.

The results obtained made it possible to analyze professional relevance in modern science as a system that includes: professionalism of activity (individual experience in achieving high professional results and competencies); professionalism of personality (subjective individual typological characteristics, self-sufficiency and high moral standards, acceptance of universal values).

A scientific description of professional relevance as a multilevel, hierarchical phenomenon with links to other psychological formations is possible using a systematic methodological approach in psychology. The interpretation of the concept of “tolerance to uncertainty” depends on the psychodiagnostic research tools, and the substantive characteristics reveal the ability to professionally solve modern requirements while being in the flow of changes and increasing demands on the results of professional activity.

The close correlation between tolerance to uncertainty and preference for uncertainty and novelty indicates that the digital educational environment stimulates the search for algorithms for achieving professional activity and personality, qualitatively transforming the mental and personal resources of a teacher to integrate

modern digital educational resources and digital content into the educational process, contributing to the creation of a more interactive digital educational environment.

At the same time, the study showed that individual teachers (especially those with a low level of professional demand) need serious retraining in the system of professional development. And not only in the development of competencies, enriching skills and abilities, but also critical thinking, in order to accept the fact that information technology can never replace knowledge and dialogue communication, but they must be mastered and used as new opportunities in professional activities.

To solve this problem, programs of psychological and pedagogical support for teachers in the new digital reality are needed to introduce various services that help facilitate their work and diversify interaction with students (use neural networks in the development of training sessions from the topic to the assessment of the level of knowledge), which ultimately will ensure a significant level of professional demand.

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不同主导感知方式学生阅读时的眼动反应

OCULOMOTOR REACTIONS IN STUDENTS WITH DIFFERENT DOMINANT PERCEPTIVE MODALITIES WHEN READING

Zvyagina Natalya Vasilievna

*Candidate of Biological Sciences, Associate Professor,
Head of Department*

Taleeva Anna Ilyinichna

Candidate of Biological Sciences, Associate Professor

Skulyabina Daria Andreevna

Postgraduate student

Northern (Arctic) Federal University named after M.V. Lomonosov

注释。当前，利用计算机技术进行学习备受关注。在信息过载的情况下，计算机技术可以通过加速信息传递和缩短信息呈现时间来呈现大量信息。改变信息传递速度对这些手段的使用者提出了特殊要求。在这方面，研究阅读动态文本过程中的眼动活动以及具有不同心理生理特征的代表记忆呈现信息的效率非常有趣。这项研究涉及北方（北极）联邦大学的43名学生，年龄在19至21岁之间。我们研究了具有不同主导感知模式的学生在阅读不同呈现时长的运动单词时的眼动反应。与“听觉”和“动觉”主导的学生相比，具有主导视觉感知模式的学生在阅读以不同速度移动的单词时，任务执行效率更高，并且伴随眼动反应的特异性。“视觉”也显示出认知活动效率与眼动活动参数之间存在可靠的相关性。

关键词：眼动活动、扫视、注视、认知活动、阅读、主导感知方式。

Annotation. *Currently, the issue of learning with the help of computer technologies is of interest, which in the conditions of information overload allows to present a large volume of information by accelerating the delivery of information and reducing the time of its exposition. Changing the speed of information delivery imposes special requirements on users of these means. In this regard, it is very interesting to study oculomotor activity in the process of reading a dynamic text, as well as the efficiency of memorizing the presented information in representatives with different psychophysiological characteristics. The study involved 43 students of the Northern (Arctic) Federal University aged 19 to 21 years. We studied the oculomotor reactions of students with different dominant perceptual modalities when reading moving words with different durations of presentation. In students with a dominant visual perceptual modality, compared with “audials” and “*

kinesthetics” when reading words moving at different speeds, a higher efficiency of task performance was recorded, which is accompanied by the specificity of oculomotor reactions. “Visuals” also showed reliable correlations between the efficiency of cognitive activity and parameters of oculomotor activity.

Keywords: *oculomotor activity, saccades , fixations, cognitive activity, reading, dominant perceptual modality.*

Introduction

During information overload, a necessary condition for perceiving a large volume of educational information is to speed up the delivery of information and reduce the time of its exposure. In this paradigm, it is convenient to use methods for recording oculomotor activity during cognitive activity and analyzing the main parameters of eye movements (fixations and saccades) [2]. Eye tracking indicators mark the thought processes of perceiving visual information and will reflect changes in cognitive activity when the conditions of activity become more complex [4]. Thus, some information can be presented in the format of a running line, which allows an unlimited amount of information to be exposed in a relatively small area. However, reading a moving text is not identical to reading a stationary text. The reading skill formed on printed texts includes an important component of spatial gaze control, or spatial reading strategies [1]. These include: a sequence of fixations on lines, transfer of gaze from one line to another, micro- and macro regressions, i.e., return movements of the gaze within one or more lines [3]. Moving text is a powerful optokinetic stimulus that can change the pattern of oculomotor activity [3]. Obviously, reading moving text eliminates the possibility of regressions (evolutionarily fixed visual return to the previous text), which necessarily accompany reading or viewing images on paper or electronic media in natural conditions [1]. When reading moving text, conditions are created that contribute to some decrease in the depth of processing and / or limitation of the volume of information contained in the mnemonic buffer. As a result, the level of understanding tends to decrease, especially at the initial stages of working out this reading mode. This puts forward the task of specially developing the skill of reading moving text [3]. That is, the presentation of text information with a shortened exposure or in the form of a running line can affect the quality of its perception, comprehension, understanding, memorization and reproduction, which may have features in representatives with different psychophysiological characteristics. Undoubtedly, a person perceives, codes and remembers incoming information with the participation of the auditory, visual, kinesthetic channel of perception, but one of them is the leading one [5]. The hierarchy of perception modalities and the structural features of their interaction are unique for each person [6]. In this regard, the efficiency of activity in representatives with a predominance of a certain mo-

dality (visual, auditory, kinesthetic, etc.) may differ, for example, when perceiving visual information. Thus, the study of oculomotor activity when reading moving words, the assessment of the efficiency of performing a given mental task in representatives with different types of leading modalities are relevant tasks for modern psychophysiology, physiology and psychology.

Objective: to establish the characteristics of oculomotor activity in young individuals with different types of perceptual modality when reading words with different exposure durations.

Materials and methods

The study involved 43 students of the Northern (Arctic) Federal University (average age 20 years). At the time of the study, all participants noted physical, mental and social well-being, had the same mental and physical workload, had no history of chronic diseases, mental disorders, traumatic brain injuries, diseases of the visual and nervous systems, and did not take medications. The survey was conducted from March to May, in the first half of the day, outside the session period, in compliance with the ethical principles of the Helsinki Declaration of the World Medical Association (World Medical Association (WMA)).

At the first stage of the study, the parameters of oculomotor activity were assessed when reading words at different presentation speeds using a stationary binocular eye tracking system iView X™ RED, 500 Hz. The obtained eye tracking data were analyzed using the SMI BeGaze software package . The main parameters of oculomotor activity were selected for statistical analysis: fixation frequency, pcs /sec; average duration of one fixation, ms; fixation dispersion, ms²; saccade frequency, pcs /sec; average duration of one saccade, ms; saccade amplitude, deg; saccade velocity, deg/sec; saccade latency, ms.

The stimulus material consisted of a sequential presentation of 5 series of words moving from left to right, top to bottom, with different speeds and exposure times. The words used included nouns in the nominative case, verbs, and adjectives with 4 to 8 letters. The words were not repeated within one trial. The presentation time of each stimulus series was 10 seconds. First, words were presented with an exposure time of 100, then 200, 300, 400, and 450 words per minute. Each new series was preceded by a fixed point in the center of the monitor screen for 5 seconds. The results for exposure times of 100 and 450 words per minute (hereinafter, condition 1 and condition 2) were used for statistical data processing. At the end of viewing each series of words, it was necessary to reproduce the last word shown on the monitor by choosing from 6 options presented on the monitor. During the task, correct answers and errors were recorded to calculate the efficiency of cognitive performance by dividing the number of correctly named words in five series by the number of words in five series presented for memorization (5) multiplied by 100%. Thus, the closer the value to 100, the more effectively the task was completed.

Next, the dominant perceptual modality was determined using the S. Efremtsev test, which made it possible to determine which type of perception was dominant in a particular subject: auditory, visual or kinesthetic [13]. Based on the data obtained, the students were divided into three groups.

Statistical analysis of the parameters under study was performed using the IBM SPSS Statistics 23.0 program. The nonparametric data processing method was chosen as a descriptive analysis. The reliability of differences in the parameters under study during activity in different conditions of word presentation was assessed using the nonparametric Wilcoxon signed-rank test. The Mann–Whitney statistical test was used to identify the significance of differences in the parameters of oculomotor activity between the groups. Correlation analysis with calculation of the Spearman rank coefficient was used to study the structure of the relationships between the variables under study.

Results and discussions

The analysis of oculomotor activity in students with different dominant perceptual modalities when reading moving words with different presentation speeds showed statistically significant differences. It was found that when reading moving words at a speed of 100 wpm, the dispersion of fixations was 14% higher in visual students than in kinesthetic students (62.6 and 52.5 ms², respectively, $p=0.05$). A higher dispersion of fixations demonstrates their higher variability in visual students, which indicates greater flexibility of the visual perception system and allows better adaptation to the perception of a moving stimulus [7]. In addition, higher parameters of the dispersion of fixations during cognitive activity indicate less stereotypical eye movements. Statistically significant differences were found in the saccade amplitude parameter: for visual students, this indicator was significantly lower than for auditory and kinesthetic students ($p=0.05$). Lower saccade amplitude values in visual perceptual modality individuals are likely due to more detailed scanning of visual stimulus elements, which requires short eye movements. Auditory and kinesthetic individuals use higher amplitude saccades to cover a larger volume of information without focusing on details [9, 12].

When reading moving words at a higher presentation rate (450 wpm), statistically significant differences were found: the average fixation duration was 19% lower for visual students than for kinesthetic students (185.4 and 227.5 ms, respectively, $p=0.03$). Also, the average saccade duration was 10% lower for this group than for auditory students (37.8 and 42.1 ms, respectively, $p=0.05$), indicating that visual students are able to analyze visual details and text structure more quickly. They can quickly scan words, making short stops to perceive the main elements, since they are used to quickly switching between objects and fragments of visual information [10, 12]. Thus, with a reduction in the exposure of visual stimuli, visual students scan and process the stimulus faster.

Reliable differences in the parameters of oculomotor activity were found within the groups of students with different dominant perceptual modalities when reading with word exposure at a speed of 100 wpm compared to a speed of 450 wpm. In all the studied groups, the frequency of fixations and saccades when reading words presented at a speed of 100 wpm was significantly lower than at a presentation speed of 450 wpm ($p=0.001$), and the duration of fixation was longer ($p=0.001$). Changes in the frequency of saccades, fixations and their duration at different speeds of word presentation in all three groups are associated with similar adaptation processes - when the presentation speed increases, the brain needs to adapt to ensure effective perception and understanding of the text. In auditory students, when performing a task at a speed of 450 wpm, the saccade duration is 14% longer ($p=0.017$) than when reading words presented at a speed of 100 wpm; in the kinesthetic group, activity under condition 2, compared to condition 1, is characterized by a 14% faster saccade ($p=0.026$). Probably, an increase in the saccade duration in auditory students allows them to scan the visual field more efficiently, but with shorter fixations, the processing of these stimuli will not be as effective. In kinesthetic students, an increase in the saccade speed leads to an acceleration of saccades, which also does not ensure high efficiency of activity [8, 11].

When assessing the effectiveness of activities within the framework of the oculomotor study, statistically significant differences were found in students with different dominant perceptual modalities. In visual students, the level of effectiveness of cognitive activity is significantly higher than in auditory and kinesthetic students ($p=0.05$ and $p=0.01$, respectively).

When determining the correlation relationships between the indices of oculomotor activity and the efficiency of cognitive activity in representatives with different perceptual modality, reliable direct and inverse correlation relationships were revealed. In auditory and visual students, the frequency of gaze fixations when reading moving words with different presentation speeds has a significant average direct statistical relationship with the frequency of saccades and a significant strong inverse relationship with the average duration of fixations (auditory $r=0.662$; $p=0.010$; and $r=-0.941$; $p=0.001$, respectively; visual $r=0.918$; $p=0.001$ and $r=-0.911$; $p=0.010$). In this case, a strong feedback is formed between the frequency of saccades and the duration of fixations (auditory $r = -0.790$; $p = 0.001$; visual $r = -0.889$; $p = 0.001$), as well as a strong direct relationship between the amplitude and speed of saccades (auditory $r = 0.764$; $p = 0.001$; visual $r = 0.715$; $p = 0.010$). Also, for visual students, there is a significant statistical feedback in the correlation constellation between the efficiency of cognitive activity and the amplitude of saccades ($r = 0.715$; $p = 0.010$). That is, for auditory and visual students, when reading moving words

at different speeds of presentation, a similar correlation constellation of oculomotor parameters is formed. But in visual students, the efficiency of cognitive activity is inversely dependent on the amplitude of saccades, which indicates that visuals, being more sensitive to details, strive to reduce the amplitude of saccades in order to better control the process of information perception - apparently, this dependence makes a certain contribution to maintaining the high efficiency of word reading by representatives of this group. In the group of kinesthetic students in the correlation constellation, reliable direct and inverse connections of the parameters of eye movements when reading moving words are more diverse. The largest number of strong statistical direct and inverse connections are closed on the parameters of frequency of fixations and saccades, duration of fixations, speed of saccades. However, such a statistical model does not provide a high level of efficiency of activity, which we observed in representatives with the kinesthetic type of perceptual modality.

Conclusion

The revealed differences in oculomotor reactions in students belonging to different types of perceptual modality are associated with their preferred methods of information processing. For visual students, the visual channel of information perception is the main one, so they “scan” the visual space, making shorter eye movements and process information faster, which ensures more efficient activity. High efficiency of visual cognitive activity in visual students is also ensured by significant statistical relationships between oculomotor parameters and efficiency of activity. The revealed features reflect the features of adaptation of the visual perception system and the brain to new conditions of activity.

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希萨尔河谷（塔吉克斯坦）的珍稀鸟类标本
RARE BIRDS SPECIMEN IN THE HISAR VALLEY (TAJIKISTAN)

Muratov Rustam Sharifovich

*Candidate of Biological Sciences, Head of Department
Institute of Zoology and Parasitology named after E.N. Pavlovsky of the
National Academy of Sciences of Tajikistan*

摘要. 本文描述了吉萨尔河谷地区16种列入塔吉克斯坦共和国红皮书的珍稀濒危鸟类。文中介绍了这些鸟类在近现代和古代的种群状况，并描述了该地区的新发现。

关键词: 希萨尔河谷, 鸟类, 珍稀濒危物种, 塔吉克斯坦共和国红皮书, 迁徙, 筑巢, 定居, 栖息地。

Abstract. *The presented work describes 16 rare and endangered bird species of the Red Book of the Republic of Tajikistan, which are found in the territory of the Gissar Valley. The state of the population of the modern and past periods of time is given, new finds in the territory of this region are described.*

Keywords: *Hisar Valley, birds, rare and endangered species, Red Book of the Republic of Tajikistan, migratory, nesting, sedentary, habitats.*

The Hisar Valley is an important center of the economic region of the republic. Its boundaries are natural boundaries: in the north - the watershed spurs of the Hisar Range, from the east - the Karategin Range and in the south - a series of low ridges Babatag, Karshitau, Abdulovit, Shirbibi and Tian. The surrounding ridges have different heights and, accordingly, natural landscape conditions from mid-mountain in the south to nival in the north [11].

The main part of the Hisar Valley is located at altitudes from 800 to 1100 m above sea level, and Dushanbe, the capital of the republic, is also located here.

The complexity of the relief and other physical and geographical conditions create a variety of conditions for the soil-forming process, which is an important component for the vital activity of living organisms, including birds.

Bird observations were carried out on one-time 5 km routes in the Hisar Valley areas in different seasons of the year. Birds were identified in the field using a guide - A. I. Ivanov, B. K. Shtegman: "A Brief Guide to Birds of the USSR", with amendments and additions by L. S. Stepanyan [6].

During the observations, we used the BPC 12×45 binoculars and the ZRT-457 60x spotting scope.

In our work, in addition to literary data and our own observations, we used data from the scientific ornithological collection of the Institute of Zoology and Parasitology of the National Academy of Sciences of the Russian Federation.

White stork - *Ciconia ciconia asiatica* (Linnaeus, 1758). Storks nest only on large trees or old tall buildings (such as mosques, madrassas, water towers, etc.). For Tajikistan, they are a migratory nesting bird. On the bank of the Kafarnigan River at the mouth of the Khanaka River, A.I. Ivanov found a nest of white storks; the females sat there almost until the end of April. As an example, we can cite the fact that the colony of storks that existed in 1934 and 1935 in the village of Hisar, near the village of Sarykishty on the river Kafarnigan and in the village of Guliston near Dushanbe, now does not exist.

In the Hisar Valley, nesting white storks have completely disappeared, and they are here only during accidental flights.

Black stork - *Ciconia nigra* (Linnaeus, 1758). In the Hisar Valley it is on migration, but some birds sometimes stay for the winter.

The black stork appears in the Gissar Valley very early in the spring, A.I. Ivanov saw a single stork near the river Kafarnigan on January 26, 1945; flocks of 4 individuals were noted on February 7 and 23, 1943 [5].

In the territory of the city of Dushanbe it was noted only twice: during the spring migration in March 2011 and in May 2014. [10]

Turkestan Saker Falcon – *Falco cherrug coatsi* (Dementiev, 1945). A.I. Ivanov encountered Saker Falcons nesting on the mountain slopes along the Kafarnigan River, at the mouth of the Khanaka-Darya River and near the village of Gissar. In the spring, on April 14, 1934, he found a Saker Falcon nest in the Kafarnigan River valley, and the following year, on May 15, 1935, in the same cliff, only in a different niche [5].

We noted a Turkestan Saker Falcon during its spring migration in the area of the sewage treatment plant (26.02.2012). Urban lovers of domestic pigeons often observe Saker Falcons attacking their birds in the winter and early spring. This species is more common in the northern and western parts of the city, where it prefers to hunt pigeons.

Shahin (Red-headed Peregrine Falcon) – *Falko peregrinoides* (Sclater, 1861). Quite a rare nesting bird of Tajikistan.

G. G. Georgiev got a red-headed peregrine falcon on July 17 on the Khanaka River, at its confluence with the Kafarnigan River (6 km south of Hisar), and it was a young bird [5].

Shahin winters in the city of Dushanbe. Wintering birds can be found from mid-January to the end of March. During the hunt, it chooses open spaces. It can

usually be found between high-rise industrial and residential structures, such as the city printing house, the television center tower, a number of 9-story buildings on the bank of the Dushanbinka River, as well as factory workshops, treatment facilities, etc. Hunts mainly for pigeons: rock pigeon, ringed and little turtle dove, as well as waders and teals.

Booted eagle - *Aquila pennata pennata* (Gmelin, 1788). For the Hisar Valley, it is considered a nesting and nomadic bird.

A.I. Ivanov met the booted eagle during migration and during wintering on the Kafarnigan River - near the village of Gissar, near the city of Dushanbe and in the valley of the Varzob River [5].

We often observed it in Dushanbe during pigeon hunting, more often in winter and early spring.

It should be noted by employees of the Dushanbe airport near the runway. In winter, it hunts wild and domestic pigeons within the city limits (oral communication by the engineer of the ornithological service of the Dushanbe airport M. Vokhidov and amateur ornithologist A. Latifi) [15].

Black vulture – *Aegyptius monachus* (Linnaeus, 1766). The black vulture should be classified as a sedentary and partially migratory bird.

A.I. Ivanov had to observe black vultures on the southern slopes of the Hisar Range in the Hisar Valley, where they descend to feed. Over several years of observations, we noted them only three times [5].

According to G.D. Garibamadova 03/20/2008 along the Kafarnigan River valley, not far from the southern part of the Hisar fortress - a group of 7 birds and 04/24/2011 in the Kondara gorge - 3 individuals.

We observed the black vulture in January and February 2018 at the sewage treatment plant of the city of Dushanbe during hovering.

Egyptian vulture - *Neophron percnopterus percnopterus* (Linnaeus, 1758). In May 1935, A.I. Ivanov discovered several nests of vultures in the conglomerates of cliffs along Kafarnigan, in the Gissar region. Vultures use the same nests for several years. We observed spring arrival in the Gissar Valley and in Dushanbe between March 11 and 20.

In the vicinity of Dushanbe, vultures disappear on September 23-25, so that in the first days of October they are no longer there.

The vulture can be observed during the flight through the city, from spring to autumn. During feeding and resting, it is found in large numbers in the area of the treatment facilities along the Kafarnigan River and at the city dump.

Short-toed eagle - *Circaetus ferox heptneri* (Dementev, 1932).

For Tajikistan, it is a migratory and nesting bird.

In the Gissar Valley and the environs of Dushanbe, A.I. Ivanov met a short-toed eagle during the spring migration between March 24 and May 15, 1943. Dur-

ing the autumn migration at the mouth of the Khanaka River already on August 30 [5].

G.D. Garibmamadov in the Gissar Valley on September 16, 2008 met a single individual. R. Sh. Muratov repeatedly observed the short-toed eagle during its flight in September in the vicinity of Dushanbe (opposite the village of Gulistan).

Golden eagle – *Aquila chrysaetus daphanea* (Severtzov, 1888).

It is widespread, found in most mountain and highland zones. A.V. Popov notes that the golden eagle in Gissar-Karategin is a common nesting bird and is found from the foothills to the subalpine belt. A.I. Ivanov met the wintering golden eagle in the Gissar Valley in December, January and early March [5, 7].

Settles in the mountains, choosing suitable rocky slopes for hunting. It is not found in flat and foothill zones. Nests are built under rocky ledges, on high mountain slopes. It hunts mainly for snowcock, partridge, pigeons, hares and marmots.

We have repeatedly observed golden eagles during migration in the Varzob gorge. Tajik pheasant - *Phasianus colchicus bianchii* (Buturlin, 1904). It is a sedentary bird. According to A. I. Ivanov of the 50s of the last century, the pheasant nested within the Hissar Valley from Denau to Vahdat in the tugai along Kafarnigan [5].

According to literary data, the Tajik pheasant was completely exterminated not only in the city of Dushanbe, but also throughout the Hisar Valley.

In recent years, after it was included in the Red Book of the country and was protected everywhere, numerous reports have appeared about the nesting of the pheasant throughout the Hissar Valley. It can be found 10 km south of Dushanbe in the valley of the Kafarnigan River. On the territory of the city, its presence was noted around the airport, however, its nesting within Dushanbe has not yet been proven [10].

The stone-crowned troll – *Burhinus oedicnemus astutus* (Linnaeus, 1758).

It is a migratory and nesting bird in Tajikistan. In the Hisar Valley, the stone-crowned troll regularly nested on the gravel shoals along the banks of the Dushanbe-Darya [5].

Currently, the stone-crowned troll is found only during the spring and autumn migration in the vicinity of the city. During rest and feeding, it can be observed both on agricultural lands and on the territory of the airport.

The meadow pratincole – *Glareola pratincola* (Linnaeus, 1766). It is a rare nesting and migratory bird in Tajikistan.

In the Hissar Valley, A.I. Ivanov met it during the spring migration and nesting time in the area of the mouth of the Khanaka River, but he doubted its nesting [5]. The only time a flock of four probably migratory individuals was encountered was in the vicinity of the sewage treatment facilities in Dushanbe on 24.04.2008.

White-capped Redstart – *Chaimarrornis leucocephala* (Vigors, 1831).

This bird is quite widespread in Tajikistan. Throughout its range, the White-capped Redstart is found during the nesting period at altitudes from 1,500 to 3,300 m above sea level. Being a sedentary bird of Tajikistan, it undertakes seasonal vertical migrations.

The Redstart was noted by I.A. Abdusalyamov on 21 December 1960 along the Sardoi-Miyon valley in the area of the Ramit Reserve (Gissar Range), by A.V. Popov on 12 January 1961 and by A.I. Ivanov from October 5 to 18 in the Varzob River valley [1, 5, 7].

With the onset of spring, the white-capped redstart leaves its wintering grounds. Spring return migration occurs in late February - early March and depends on climatic conditions. In snowy winters, they can be observed in gardens around Dushanbe.

Autumn migration begins in early October, when redstarts leave their main habitats due to the onset of unfavorable living conditions.

White-capped redstart - noted by us on 08.01.2012 in the area of treatment facilities and on 25.01.2012 in the botanical garden of Dushanbe.

Common Redstart – *Chaimarrornis fuliginosus* (Vigors, 1831).

This bird was noted on the Varzob River near the mouth of the Kondara River by G.D. Garibmamadov (20-21.04.2006). In June and early July 2010, a pair was repeatedly seen on the Varzob River near the village of Kondara. On 21.04.2011, two birds were observed there, including a mating male. In 2012, a nest was found in a crack in a concrete slab reinforcing the bank of the Varzob River. On 15.03.2009, in the southwestern part of Dushanbe along the Kafirnigan River, near the bridge of the Dushanbe-Bokhtar (Kurgan-Tyube) highway, one individual was observed [5]. For many years, we have been observing this bird in the Varzob River valley together with amateur birdwatchers.

Northern Striped Laughingthrush – *Garrulax lineatus bilkevichi* (Vigors, 1831).

It is a sedentary bird of Tajikistan. V.V. Leonovich saw the Laughingthrush on May 8 in the Botanical Garden of Dushanbe, at an altitude of about 900 m above sea level [5].

It regularly winters in the foothills; in the foothills north of Dushanbe, A.I. Ivanov noted Laughingthrushes from mid-November to the end of March or even in early April.

In recent years, we have encountered the Laughingthrush in all seasons among the bushes in the Botanical Garden, in Victory Park, in the cemetery, and it also nested here. We found a nest of the Laughingthrush with three eggs in the rose bushes of the Botanical Garden (March 12 and March 19). And on April 6, the chicks had already flown out of the nest. Well-flying fledglings were noted from April 15 to mid-May.

Turkestan Long-Tailed Flycatcher or Paradise Flycatcher – *Terpsiphone paradisi leucogaster* (Swainson, 1838).

In Tajikistan, this bird is quite widespread. The Long-Tailed Flycatcher is considered a migratory and nesting bird of Tajikistan.

The Long-Tailed Flycatcher arrives quite late, I.A. Abdusalyamov observed the flycatchers' flight between April 22-26 and May 5-6. A.I. Ivanov and I.A. Abdusalyamov described the flycatcher's nesting in the Varzob and Ramit gorges [3].

For the city of Dushanbe, it was considered a migratory bird. In recent years, as a result of observations by ornithologists, as well as our research, it was established for the first time that the flycatcher is found in Dushanbe not only during migration, but also nests. The flycatcher makes nests in places suitable for nesting - gardens and squares. It builds a nest on trees, near rivers, canals or streams.

Permanent nesting of the paradise flycatcher in the city of Dushanbe has been observed since 1990. The birds built nests mainly in the crowns of large old trees. In order to further preserve these two species in the city of Dushanbe, it is necessary to organize the protection of their nests in the squares and parks where they live. In addition, the creation of new green areas and squares can attract these valuable birds to nest.

Conclusion

As a result of the study, it was revealed that 16 species of rare and endangered birds are found in the territory of the Hisar Valley, which are listed in the Red Book of Tajikistan (2015). At present, such species as the white stork, bustard, stone-curlew, black-bellied sandgrouse, and meadow pratincole have practically not been found in the territory of the Gissar Valley for the last 30-40 years and may be completely lost.

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食品生产中的致病菌：微生物毒素与食品毒性感染的特点
**PATHOGENIC BACTERIA IN FOOD PRODUCTION:
CHARACTERISTICS OF MICROBIAL TOXINS AND FOOD
TOXICOINFECTIONS**

Frolova Darya Dmitrievna

Student

Kolberg Natalia Alexandrovna

Candidate of Veterinary Sciences, Associate Professor

Ural State University of Economics

摘要. 本文探讨了食品工业中最常见的致病菌主要群体、其特性及其对产品质量安全的影响，以及由这些细菌引起的毒性感染的特点。

关键词： 致病菌，病原菌特性，食品安全，食品毒性感染，微生物控制，生产卫生。

Abstract. *This article examines the main groups of pathogenic bacteria most commonly found in the food industry, their characteristics and impact on the quality and safety of products, as well as the characteristics of toxic infections caused by these bacteria.*

Keywords: *Pathogenic bacteria, pathogen characteristics, food safety, food toxic infections, microbiological control, production sanitation.*

Pathogenic bacteria are those that have the ability to penetrate into a macroorganism, multiply in it and cause infectious diseases.

For food production, the problem of the presence of pathogenic bacteria is especially relevant, since food products are a favorable environment for the reproduction of these microbes. Their presence can lead to food poisoning, infections, spoilage of raw materials and finished products. That is why control of microbiological purity at all stages of production - from raw materials to packaging - is a key aspect of ensuring food safety.

Pathogenic bacteria pose a serious threat to food safety, as they can cause diseases in humans when contaminated products are consumed. Their danger is determined by factors such as: toxicity - the ability to produce toxins, invasiveness - the ability to penetrate tissues and resistance to external factors (temperature, pH, resistance to disinfectants) [1].

The most common bacterial pathogens in food production include: *Clostridium*, *Salmonella*, *Listeria monocytogenes*, *Escherichia coli* and *Staphylococcus aureus*.

Clostridium botulinum is a spore-forming bacterium that produces a heat-labile polypeptide neurotoxin (botulinum toxin). The toxin is absorbed in the intestine and carried with the blood to the synapse of peripheral nerves, causing flaccid paralysis. Infection most often occurs when consuming contaminated foods, such as canned foods with low acidity (home-made mushrooms, fish, meat, vegetables without vinegar), smoked and salted fish, honey. *Clostridium botulinum* can also be found in products with damaged packaging.

In adults, the disease develops when a pre-formed toxin is swallowed, for example, from canned food. However, children are also susceptible to infection by this bacterium: infant botulism occurs due to the ingestion of spores found, for example, in honey. (In many countries, honey is not recommended for consumption by children under two years of age).

Symptoms of botulism include descending flaccid paralysis, as well as diplopia, dysarthria, dysphagia, and shortness of breath. *Clostridium perfringens* produces alpha-toxin (lecithinase, phospholipase), which causes myonecrosis (gas gangrene; manifested by crepitus of soft tissues) and hemolysis.

Spores germinate in tissues under anaerobic conditions. Vegetative cells produce alpha-toxin (phospholipase C) and lecithinase, which destroy membranes, damaging erythrocytes, platelets, leukocytes and endothelial cells, which leads to massive hemolysis and tissue damage. Enterotoxin produced in the intestines during food poisoning disrupts ion transport and causes watery diarrhea.

Clostridium perfringens gets into food when sanitary standards are violated or improperly stored. Most often, such products as meat products (stewed meat, cutlets, sausages, broths), poultry products (chicken, turkey) and canned food if the hermeticity of their packaging is broken are infected.

This bacterium causes food poisoning with a late onset (10-12 hours after consumption), the symptoms are non-inflammatory watery diarrhea. It resolves on its own less than 24 hours after the onset.

Salmonella is a bacterium that causes salmonellosis (intestinal infection). The main source of infection is food products, namely animals (poultry, pigs, cattle), chicken eggs - infection is possible through contaminated shells or infected ovaries of a chicken (transovarial transmission), milk - through fecal contamination of the udder or equipment.

Salmonella's special features include its ability to reproduce at temperatures from +7°C to +45°C, high humidity and neutral pH [2].

Listeria monocytogenes enters the human body through the consumption of contaminated dairy products (soft cheeses, ice cream), ready-to-eat meat products

(cold meat delicacies), vegetables and fruits (especially pre-cut), smoked fish and seafood. Cross-contamination is also possible - the transmission of infection from raw materials to finished products.

Clinically, listeriosis in healthy people manifests itself as a disease similar to influenza and resolves on its own, but in people with weakened immunity, newborns or the elderly, *Listeria monocytogenes* can cause meningitis. The main risk group for infection with this bacterium are pregnant women, since amnionitis, septicemia and spontaneous termination of pregnancy (abortion) are possible. The characteristics of *Listeria monocytogenes* include its growth at relatively low temperatures (+4°C) and resistance to salting and smoking [3].

The main products susceptible to contamination with *Escherichia coli* are raw beef (especially minced meat), unpasteurized milk, fresh vegetables (leafy greens, sprouts) and water. The routes of infection are poor hygiene by staff, insufficient heat treatment of raw materials and contact with raw meat when cutting up a carcass.

Escherichia coli is highly virulent, since 10-100 cells of this bacterium are enough to develop an infection [4].

Staphylococcus aureus is a bacterium that causes purulent-inflammatory processes when it enters the human body. Confectionery products such as creams and cakes are at the highest risk of infection due to insufficient processing of raw materials, as well as cheeses, cottage cheese and ready-made meat products. Contamination of products with *Staphylococcus aureus* usually occurs when storage conditions are violated (long-term exposure to +20 ... +30 °C).

When *Staphylococcus aureus* enters the human body, it causes not only the classic symptoms of food poisoning, but also inflammatory diseases such as skin infections, organ abscesses, pneumonia (often after infection with the influenza virus), infective endocarditis, septic arthritis and osteomyelitis.

It should be noted that this bacterium is the most pathogenic for humans, as it is capable of producing heat-stable enterotoxins. *Staphylococcus aureus* causes toxin-mediated diseases: toxic shock syndrome and scalded skin syndrome (mainly in newborns) [5].

The main measures to prevent contamination of food products with pathogenic bacteria include: strict hygiene control at the production site, inspection and inspection of incoming raw materials, animal and bird carcasses, compliance with the conditions of heat treatment and storage of products. Thus, the fight against pathogenic microorganisms in food production requires a comprehensive approach, including strict control at all stages of the technological process, constant monitoring and the introduction of modern disinfection methods. Particular attention should be paid to preventive measures and personnel training, since it is the human factor that often becomes the key link in the contamination chain.

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听力障碍儿童牙齿异常的发生率和类型
**FREQUENCY AND TYPES OF DENTAL ANOMALIES IN
CHILDREN WITH HEARING IMPAIRMENT**

Chuikin Sergey Vasilyevich

Doctor of Medical Sciences, Professor, Head of Department

Akatieva Galina Grigorievna

Candidate of Medical Sciences, Associate Professor

Speranskaia Natalia Sergeevna

Assistant

Bashkir State Medical University

摘要.本文介绍了听力障碍儿童牙齿畸形的发生率和结构数据。在混合牙列期 (94.4%) 和恒牙期 (97.6%)，听力障碍学龄儿童牙齿畸形的患病率较高，且以混合牙列为主，这表明有必要针对此类儿童制定预防和治疗方法。

关键词: 听力障碍儿童，牙齿畸形发生率，预防。

Abstract. *The paper presents data on the frequency and structure of dental anomalies in children with hearing impairment. A high prevalence of dental anomalies in schoolchildren with hearing impairment during the period of mixed (94.4%) and permanent dentition (97.6%), the prevalence of combined forms in the structure, which indicates the need to develop measures for their prevention and treatment in this category of children.*

Keywords: *children with hearing impairment, frequency dental anomalies, prevention.*

Relevance.

One of the main characteristics of children's dental health is dental anomalies. Currently, there is a high prevalence of this pathology both in healthy children and in individuals with disabilities, including children with hearing impairments [1,2,3,4,6,7,10, 12,13]. Hearing impairment is one of the most common sensory pathologies in children, negatively affecting the formation of personality and quality of life. Children with hearing and speech impairments require special medical supervision. The prevalence of hearing impairments in Russia is 190 per 1000 of the total population and 29 per 1000 children aged 0–14 years [9]. In the structure of morbidity in children aged 0-14 years, the prevalence of diseases of the ear and

mastoid process is 4141.0 per 100 thousand children of the corresponding age and 3254.9 children aged 15-17 years per 100 thousand of the child population of Russia [5].

The results of studies on the assessment of the dental status of children with hearing impairments presented in the literature indicate a high prevalence of caries and periodontal diseases in this category of children [8,11,14,15]. There is little information in the literature on the study of the frequency and types of dental anomalies in children with this sensory pathology, which served as the basis for this work.

The aim of the work is to study the prevalence and types of dental anomalies in children with hearing impairment during the period of mixed and permanent dentition.

Materials and research methods.

To achieve the set goal, we conducted a dental examination of 78 children (47 boys and 31 girls) aged 7-11 years (mixed dentition) and 83 children (52 boys and 31 girls) aged 12-16 years (permanent dentition) with hearing impairment. Informed consent was obtained from the children's parents before the examination. The results of the study were entered into the dental status registration cards.

The dental examination consisted of an external examination (assessment of facial features, posture, body type), examination of the oral cavity (condition of hard dental tissues, periodontium, occlusion of dental arches, soft tissues), assessment of the main functions of the dentofacial region (nasal breathing, swallowing, chewing, speech), identification of risk factors for the formation of dentofacial anomalies.

The frequency and types of dental anomalies and the need for orthodontic treatment were studied.

Research results and their discussion.

A dental examination of schoolchildren with hearing impairments showed that in the age group of 7-11 years (mixed dentition), 94.9% of children have dental anomalies.

Anomalies of individual teeth were detected in 52 (66.7%) of those examined, of which positional anomalies were the most common.

In 46 (58.9%) schoolchildren, dental anomalies were identified, in the structure of which disturbances in contacts between adjacent teeth (crowded or rare position) predominated.

Occlusion anomalies were diagnosed in 37 (47.4%) of the examined children. Distal occlusion predominated in the structure of occlusion anomalies.

The presence of a sagittal gap was noted in 28 (35.8%) children; its size ranged from 3 to 9 mm.

In 16 (20.5%) people, a shift in the midline (central) line was detected, with 6 people having it on the upper jaw relative to the midline of the face and 10 people having it on the lower jaw.

We found that the majority of children (71.8%) had combined types of dental anomalies.

During the examination of this group of children, a number of risk factors for the formation of dental anomalies were identified: early removal of temporary teeth, unworn cusps of temporary teeth, myofunctional disorders in the maxillofacial region, anomalies of the soft tissues of the oral cavity, and bad habits.

Defects of dental arches due to early extraction of temporary teeth were observed in 11 children (14.1%), which was the cause of shortening and deformation of dental arches, and disruption of chewing function. Unworn tubercles of temporary teeth were observed in 11.5% of those examined.

Soft tissue anomalies (short frenulum of the tongue, low attachment of the frenulum of the upper lip, high attachment of the frenulum of the lower lip, shallow vestibule of the oral cavity) were diagnosed in 32 children (41.0%).

Among the harmful habits we identified in children, the most common were: impaired swallowing function (infantile type) in 22 (28.2%) children; oral and mixed breathing in 16 (20.5%); biting the lower lip in 11 (14.1%); sucking and biting various objects (pen, pencil, nails) in 14 people (17.9%). All the examined schoolchildren had speech impairment of varying severity. Dysfunction of the temporomandibular joint was diagnosed in 4 people (5.1%).

All examined children with dental anomalies required consultation and treatment from an orthodontist.

In the age group of 12-16 years (permanent bite), various forms of dental anomalies were diagnosed in 97.6% of the examined schoolchildren.

Dental anomalies were detected in 58 (69.9%) children, of which the most common were positional anomalies.

Anomalies of dental arches were identified in 74 (89.2%) schoolchildren, in the structure of which disturbances in contacts between adjacent teeth predominated.

Dental occlusion anomalies were diagnosed in 56 people (67.5%); distal occlusion predominated in the structure. Combined dentoalveolar anomalies were observed in the majority of examined schoolchildren of this group (85.5%).

Anomalies of the soft tissues of the mouth were diagnosed in 46 schoolchildren (63.8%) with hearing impairment, among which the most common was a short frenulum of the tongue (57.8%). Dysfunction of the temporomandibular joint was detected in 16 people (19.3%).

All examined children of this age group with dental anomalies needed consultation and treatment from an orthodontist, but only two schoolchildren had an orthodontic appliance and one teenager had previously undergone orthodontic treatment and a fixed retainer.

Conclusions.

The results of the study indicate a high prevalence of dental anomalies in schoolchildren with hearing impairment during the period of mixed (94.4%) and

permanent dentition (97.6%). Formed dental anomalies negatively affect the functions of chewing, swallowing, speech, facial aesthetics, are a risk factor for the development of caries, periodontal disease, oral mucosa, dysfunction of the temporomandibular joint, and also require the use of complex orthodontic devices. The high need of the examined schoolchildren for orthodontic treatment indicates the need to develop measures for the prevention and treatment of dental anomalies in children with hearing impairment.

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医疗服务市场中的牙科护理概念模型
CONCEPTUAL MODELS OF DENTAL CARE IN THE MEDICAL SERVICES MARKET

Karimova Daniia Yusufovna

*Doctor of Medical Sciences, Full Professor
A.I. Burnazyan Federal Medical Biophysical Center*

Utkin Alexandr Vladimirovich

*Postgraduate
A.I. Burnazyan Federal Medical Biophysical Center*

摘要.世界各国民众牙科保健组织模式差异巨大。这些模式取决于诸多因素：国家的经济、政治和意识形态、人才储备及其培训体系、民众的偿付能力、医疗保健结构等。本研究旨在分析这些模式的多样性，并基于文献资料进行比较分析。各国的牙科保健模式差异巨大——从缺乏医疗保健体系到深层的结构化和规划。世界上大多数国家都采用混合模式——国家-市场，因为事实证明这种模式最为有效。

关键词：牙科保健模式，医疗服务市场。

Abstract. *Models of dental care organization for the population are extremely diverse in different countries of the world. They depend on many factors: economy, politics and ideology of the state, availability of personnel and their training system, solvency of the population, structure of medical care, etc. The aim of the study was to analyze the varieties of these models. Their comparative analysis was carried out based on literary data. Models of dental care are extremely different - from the absence of any health care system to its deep structuring and planning. Most countries in the world have a mixed model of dental care for the population - state-market, since it turns out to be the most effective.*

Keywords: *models of dental care, medical services market.*

Relevance. One of the most important tasks of the reforms currently being carried out in the domestic health care system is the adaptation of this industry to the conditions of market relations that are gaining ground in all spheres of socio-economic life in Russia. It should be noted that in the system of organizing dental care for the population, as in no other area of the health care system, in recent years the

multi-structure of the dental service has begun to actively develop, and the private sector of the service is forming especially quickly.

Models of organizing dental care for the population are extremely diverse in different countries of the world. They depend on many factors: the economy, politics and ideology of the state, the availability of personnel and the system of their training, the solvency of the population, the structure of medical care, etc.

World experience presents a number of provisions (axioms) that have been well proven by many years of practice in countries of the world, without taking into account which it is impossible to build a model of organizing dental care for the population.

In this regard, the goal of the study was set: to analyze the varieties of dental care models in the conditions of the medical services market.

Material and methods of the study. Based on literary sources, a comparative analysis of the varieties of dental care models was carried out in a number of countries with different socio-economic formations.

Results and discussion. Models of dental care in different countries vary greatly - from the absence of any health care system (China, India, many African countries) to its deep structure and planning (former USSR, Cuba). Most countries in the world have a mixed model of providing dental care to the population - state-market, since it turns out to be the most effective.

A basic analysis of modern models of providing dental care showed the following: there are two extreme versions of models of dental care to the population: a) entirely at the expense of the state (budget); b) entirely at the expense of the population.

The first model is typical mainly for countries with a centralized economy and an appropriate health care system. It is in conflict with the axioms of organization and management of dentistry and cannot provide the population with effective, modern and affordable dental care.

The second model is typical for two types of countries: a) rich market countries with high incomes of the population (USA); b) very poor, underdeveloped countries with no or very weak health care (a number of third world countries - Moldova, Tajikistan, etc.) [1, 2]. Rich market countries offer both the dental community and the population the opportunity to freely choose a dentist, a dental organization, the cost of dental care, formed on the basis of free competition, supply and demand, laws that provide for the principles of operation of such a system. In poor countries, with the absence or underdeveloped health care system, dental care is also formed on the basis of supply and demand, free competition, but without appropriate legislation, spontaneously and is characterized by low availability of dental care and high cost, disproportionate to the income of the majority of the population. All other countries are characterized by intermediate models between these extreme options.

When building any model of dental care organization, it is necessary to understand and take into account the interests of three stakeholder groups of society. Their interests coincide only in certain positions, therefore, building a model of dental care that fully meets the interests of all three groups is actually unrealistic. Building any model is possible only on the basis of mutual interests, concessions and compromises.

The conditions and ways of finding compromises and concessions, the possibilities for which are very wide and varied and affect a wide variety of factors of social, professional, medical, material, financial and other conditions. These conditions must be used on the basis of the provisions.

At the same time, there are three groups of society interested in optimal assistance: a) the state and local authorities; b) the population; c) medical personnel of dental organizations.

The interests of the state and authorities consist of their responsibility to ensure a high level of health of the population; manageability of the service on the basis of the law; availability of dental care for various segments of the population; social and economic acceptability (for the state and the population) of the form of dental care.

The interests of the population are the availability of dental care; its quality; social, economic acceptability and attractiveness of the form of care, responsibility for it; the possibility of choosing the form of care, dental organization and dentist; sufficient information about the disease and treatment.

The interests of the medical personnel of dental organizations are a decent level of payment; professional and social security; independence of choice (within the law) of the form, place of work, professional behavior; professional, functional and resource security of the work of specialists and the possibility of their regular improvement; independent and proactive solution of professional problems.

Thus, three groups of society should be involved in the creation of an effective system of dental care for the population: different levels of official power; professionals; the population. The interests of these three groups are different and cannot coincide completely. Their effective interaction is possible only with mutual compromises. Strong-willed decisions of the authorities inevitably entail the emergence of contradictions between them and professionals, the extreme manifestation of which is the departure of professionals to the black (gray) economy or the development of corrupt relations. Lack of supervision of the dental industry by the authorities also inevitably entails a decrease in the availability, quality and convenience of dental care for the population. Poor consideration of the interests of the population leads to a decrease in the availability of dental care, an increase in its cost and, ultimately, to social conflicts [3, 4].

Available world experience also shows that the problems of dental services and care cannot be solved without using several sources of funding, taking into

account social factors, and pronounced interaction with government authorities. The most important role is played by the methods of allocating and spending funds on dental care. The convenience of the state, the population and professionals in receiving, accounting, planning, reporting on these funds depends on them. The possibility of developing corruption, the degree of responsibility, and the funds spent also depend on this. The experience of many countries shows that the most effective per capita allocation of funds, including through the insurance system, for dental care. However, in this case it is very important to take into account the mentality of the population, the reliability and adjustability of tariffs, and the income of dentists.

Conclusion. Thus, the models of organizing dental care for the population are extremely diverse in different countries of the world. No state in the world is capable of providing the population with high-quality and modern dental care at the expense of the budget; it is not capable of allocating the necessary funds for modern dental equipment, technologies and materials for the treatment and prevention of dental diseases in the population. Only state-market forms of organizing dental care with several sources of financing are rational. Therefore, it is currently not possible to create ideal dental care in the state or something close to it, and a solution can be found in the fact that satisfactory dental care for the population can be based on public-private partnership.

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与围产期中枢神经系统受累相关的功能性胃肠病
**FUNCTIONAL GASTROINTESTINAL DISORDERS,
ASSOCIATED WITH PERINATAL CENTRAL NERVOUS SYSTEM
INVOLVEMENT**

Bryksina Evgeniya Yurievna

*Doctor of Medical Sciences, Professor
Rostov State Medical University*

Letifov Gadzhi Mutalibovich

*Doctor of Medical Sciences, Professor, Head of Department
Rostov State Medical University*

Davydova Nadezhda Anatolyevna

*Candidate of Medical Sciences, Associate Professor
Rostov State Medical University*

Eliseeva Nina Dmitrievna

*Assistant
Rostov State Medical University*

摘要. 本研究发现, 围产期中枢神经系统 (CNS) 病变与胃肠道功能障碍之间存在密切的直接相关性。神经系统病变与胃肠道病变的相关性在胎龄小于 32 周的患儿中最为显著。因此, 早产儿中枢神经系统损伤的严重程度会随着胎龄的缩短而增加, 且与胃肠道功能障碍存在相关性, 因此需要对此类患者进行综合诊断和治疗。

关键词: 功能障碍、胃肠道、早产、脑缺血、脑室内出血。

Abstract. In the course of the study, a strong direct correlation was established between the perinatal pathology of the central nervous system (CNS) and functional disorders of the gastrointestinal tract. The maximum correlation of neurological and gastrointestinal pathology occurred in children with a gestational age of less than 32 weeks. Thus, the severity of CNS damage in premature infants increases as the gestational age decreases and correlates with functional disorders of the gastrointestinal tract, which requires an integrated approach to the diagnosis and treatment of patients in this category.

Keywords: functional disorders, gastrointestinal tract, prematurity, cerebral ischemia, intra ventricular hemorrhage.

The rate of diagnosis of “perinatal damage to the central nervous system” or “cerebral ischemia” in children in intensive care units, neonatal pathology, exceeds 90%. According to current data, the incidence of hypoxic CNS damage in full-term newborns is 1-6: 1000, while in premature newborns it varies from 33% to 70%. The incidence of hemorrhagic, as well as hypoxic, CNS damage is inversely proportional to gestational age and ranges from 60% to 90%, with the maximum value of this indicator in newborns with gestational age less than 27 weeks [1]. A significant contribution to the pathogenesis of perinatal CNS damage is made by the antenatal period with fetoplacental insufficiency, an increase in hypoxia, hypercapnia, redistribution of systemic blood flow and cerebral hypoperfusion [2, 3]. Systemic hemodynamic disorders play an important role in the development of hypoxic and hemorrhagic brain damage. Low systemic pressure can lead to cerebral hypoperfusion with the development of hypoxia, metabolic acidosis, increased vascular permeability and cerebral edema.

One of the most common comorbid pathologies in premature infants with CNS damage of various origins is functional gastrointestinal disorders. It was found that more than 50% of children with perinatal damage to the central nervous system have various gastrointestinal disorders, mainly represented by a decrease in the accommodation capacity of the stomach, dyskinesias of the motor-sphincter apparatus of the hypo- or hyperkinetic type, the most common clinical manifestation of which is regurgitation of a pathological nature [4, 5].

The aim of the work is - to establish the features of the relationship between perinatal damage to the central nervous system in premature newborns with functional disorders of the gastrointestinal tract for the subsequent optimization of the complex therapy program.

Materials and methods

The study included 75 premature babies with gestational age from 26 to 36 weeks, body weight from 750 grams to 2980 grams with observation during the first three months of life. Depending on the gestational age, newborns were divided into 4 groups: 1 group - 14 children with a gestational age of 26 weeks -27 weeks 6 days: 26.6 [26.3; 26.8], group 2 - 18 children with a gestational age of 28 weeks -31 weeks 6 days: 29.7 [28.2; 30.5], group 3 - 22 children with gestational age 32 weeks -34 weeks 6 days: 33.7 [32.6; 33.8], group 4 - 21 children with a gestational age of 35 weeks -36 weeks 6 days: 35.2 [35.2; 35.7]. In addition to general clinical diagnostic manipulations, a dynamic assessment of the neurological status was carried out with the determination of the main syndromes according to the classification of the Russian Association of Perinatal Medicine Specialists, a neurosonographic study.

The diagnosis of perinatal CNS damage was established according to the criteria given in the classification approved by the Russian Association of Perinatal Medicine Specialists [6].

The diagnosis of functional disorders of the gastrointestinal tract, in addition to clinical symptoms, included an ultrasound examination of the stomach with an assessment of the functional state of its cardiac and pyloric departments during feeding and two hours after feeding. Statistical processing of the study results was carried out using the Statistica 15 for Windows program (Stat Soft). Differences between the compared values at $p < 0.05$ were considered statistically significant. Measurement of the dependence of variables was carried out by means of a parametric correlation indicator - Pearson's linear correlation coefficient and a non-parametric correlation indicator - Spearman's rank correlation coefficient.

Results and its discussion

According to the results of the study, there was a statistically significant relationship between the gestational age and the severity of hypoxic/hemorrhagic damage to the central nervous system: cerebral ischemia (CI), the degree of intraventricular hemorrhage (IVH), the frequency of periventricular leukomalacia (PVL) ($r = 0.645$, $r = 0.57$, $r = 0.72$, respectively, $p < 0.05$). In newborns in group 1, grade III CI prevailed - 64.4%, in 85.8% of cases combined with IVH, while grade I IVH occurred in 21.5% of children, grade II - in 50.1%, grade III - in 14.4%. Periventricular leukomalacia occurred in 21.5% of children in this group. Children in group 2 had a higher incidence of grade II CI (89%), grade II IVH (44.5%) ($p < 0.05$). The incidence of PVL in children in group 2 was 16.7%. Diffuse changes with pronounced signs of immaturity of brain structures on the neurosonogram prevailed in both groups. In groups 3 and 4, the incidence of PVL was minimal. There was a decrease in the total number of cases of HBC with a predominance of 31.9% in group 3 of grade I IVH, grade II IVH occurred in 13.7% of cases, grade III IVH - in 4.6% of cases. Group 4 was distinguished by the smallest number of newborns with hemorrhagic damage to the CNS, so the number of children with grade I and II IVH was 23.9% and 4.9%, respectively. In both groups, of all CI cases, grade II ischemia prevailed.

During dynamic follow-up, 56% of all children included in the study had ventriculomegaly by the end of the neonatal period, the severity of which was determined by post-conceptual age, the nature of ischemic/hemorrhagic damage to the CNS, as well as the presence of comorbid infectious damage to the CNS. In a number of clinical cases, occlusive hydrocephalus could be pathogenetically associated with combined ventriculitis and, associated with it, obstruction at the level of Mozhandi and Lyushko holes. By the end of the third month of life, 47.6% of children with ventriculomegaly had regression of cerebrovascular disorders against the background of pathogenetic therapy. With severe hypoxic damage to the CNS and the presence of PVL, cystic transformation of periventricular and/or subcortical localization developed by the end of the second month of postnatal age.

In neurological status, the most common was diffuse muscle hypotension syndrome against the background of gestational, morphofunctional immaturity and CNS depression syndrome. In 25 (33.3%) enrolled patients (10 children from group 3 and 15 children from group 4), by the end of the neonatal period, the depression syndrome was replaced by hyperexcitability syndrome. In children with gestational age less than 34 weeks, CNS depression syndrome persisted throughout follow-up.

Determination of the correlation relationship between functional disorders of the gastrointestinal tract and neurological pathology represented by CI, hemorrhagic damage to the central nervous system, hypertension syndrome revealed a strong relationship with high correlation coefficient values. Impaired peristaltic activity of the gastrointestinal tract had the strongest correlation with CI, accompanied, in the main percentage of cases, by vegetative-visceral dysfunctions with hypomotor type of dyskinesia (Table 1).

Table 1

The relationship between functional disorders of the gastrointestinal tract and CNS pathology in the studied population of children

	CI	VM	IVH	PVL
Gastroesophageal regurgitation	r= 0,68 p=0,0038	r=0,61 p=0,0056	r=0,58 p=0,0076	r=0,48 p=0,008
Duodenogastric regurgitation	r=0,63 p=0,002	r=0,62 p=0,058	r=0,51 p=0,0078	r=0,42 p=0,0092
Hypomotor intestinal dyskinesia	r=0,67 p=0,0031	r=0,36 p=0,027	r=0,38 p=0,032	r=0,45 p=0,007
Hypermotor intestinal dyskinesia	r=0,62 p=0,0033	r=0,47 p=0,0065	r=0,35 p=0,029	r=0,25 p=0,014

Note: CI - cerebral ischemia, VM - ventriculomegaly, IVH - intraventricular hemorrhage, PVL - periventricular leukomalacia.

According to the results of correlation analysis, in children with gestational age less than 32 weeks, the strength of correlation between neurological and gastrointestinal pathology was maximum (Table 2).

Table 2.

Relationship of functional gastrointestinal disorders and neurological pathology in children with gestational age less than 32 weeks

	CI	VM	IVH	PVL
Gastroesophageal regurgitation	r= 0,71 p=0,0038	r=0,67 p=0,0036	r=0,62 p=0,0038	r=0,59 p=0,007

Duodenogastric regurgitation	r=0,69 p=0,004	r=0,68 p=0,029	r=0,64 p=0,0048	r=0,52 p=0,008
Hypomotor intestinal dyskinesia	r=0,68 p=0,0033	r=0,58 p=0,015	r=0,68 p=0,012	r=0,57 p=0,003

Note: CI - cerebral ischemia, VM - ventriculomegaly, IVH - intraventricular hemorrhage, PVL - periventricular leukomalacia.

Analyzing the data obtained, it is advisable to note that vegetative imbalance plays one of the fundamental roles in the pathogenesis of gastrointestinal dysfunctions in newborns and children of the first months of life with perinatal damage to the central nervous system. Dissociative disorders of cortical-subcortical relationships due to hypoxic brain damage, cerebrospinal disorders of hypoxic and/or hemorrhagic genesis with subsequent development, hypertension-hydrocephalic syndrome, compression effect on cerebral structures, can lead to a variety of variants of functional disorders of the gastrointestinal tract due to pathology of vegetative support. The predominant influence of individual clinical factors on the nature of functional disorders of the gastrointestinal system was determined.

Cerebrospinal fluid disorder syndrome, hereditary predisposition to digestive diseases in late prematurity contribute to increased production of hydrochloric acid by the glands of the gastric mucosa. Morphofunctional and gestational immaturity in combination with initial cerebrospinal fluid disorders, on the contrary, are combined with the hypoacid nature of gastric epithelial secretion. A polyetiological imbalance in the activity of the autonomic nervous system can lead to the development of disorders of both motor activity and secretory processes in the gastrointestinal tract [4].

Thus, hypoxic and/or hemorrhagic brain damage has a complex polycomponent etiological structure, including cerebrovascular disorders with the development of circulatory and hemic hypoxia, reperfusion injury, against the background of metabolic, neuroregulatory, rheological disorders and combined multisystem pathology.

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离体猪肺漏气模型评估：密封剂单用或联合胶原蛋白补片的比较研究
**EVALUATION OF PULMONARY AIR LEAKAGE IN AN EX VIVO
PORCINE LUNG MODEL: COMPARATIVE STUDY OF SEALANTS
ALONE OR COMBINED WITH COLLAGEN PATCHES**

Ma Qingyun

Ph.D student

I.M. Sechenov First Moscow State Medical University

Berikkhanov Zelimkhan Gezy-Makhmaevich

Candidate of Medical Sciences, Associate Professor

I.M. Sechenov First Moscow State Medical University

Ivanova Milena Yuryevna

Resident

I.M. Sechenov First Moscow State Medical University

Tarabrin Evgeniy Aleksandrovich

Doctor of Medical Sciences, Head of Department

I.M. Sechenov First Moscow State Medical University

摘要.目的：本研究旨在通过离体猪肺模型评估三种密封剂（丙烯酸酯乳胶、纤维蛋白-凝血酶胶和氰基丙烯酸酯胶）单独或联合胶原补片密封肺漏气的效果。

方法：新鲜猪肺（n=18）经标准化处理后，建立穿透性缺损（2×2 cm）以模拟临床漏气，连接至机械通气系统（PEEP=5 cm H₂O，吸呼比=1:2）。样本随机分为6组（n=3/组），分别测试密封剂单独或联合3×3 cm胶原补片的密封性。通过逐步增加通气压力（20–50 cm H₂O），评估漏气频率、补片稳定性及最大耐受压力。

结果：氰基丙烯酸酯胶+胶原补片组在最大通气压力（50 cm H₂O）下表现出100%的密封性，且补片-组织界面无分层，显著优于其他组。相比之下，纤维蛋白-凝血酶胶+补片组和丙烯酸酯乳胶+补片组分别在40 cm H₂O和25 cm H₂O时出现漏气和补片脱落。

结论：该离体模型可有效筛选材料组合。氰基丙烯酸酯胶联合胶原补片在离体模型中展现出优异的抗高压密封性能，但其热释放效应及长期生物相容性仍需进一步验证。

关键词：离体猪肺模型；肺漏气；密封剂；胶原补片

Abstract. Objective: This study aimed to evaluate the efficacy of three sealants (acrylate latex, fibrin-thrombin glue and cyanoacrylate glue) alone or combined

with collagen patches in sealing pulmonary air leaks using an ex vivo porcine lung model.

Methods: *Fresh porcine lungs (n=18) were standardized, and penetrating defects (2×2 cm) were created to simulate clinical air leakage. Lungs were connected to a mechanical ventilation system (PEEP=5 cm H₂O, I:E=1:2). Samples were randomized into six groups (n=3/group) to test sealants alone or combined with 3×3 cm collagen patches. Air leakage frequency, patch stability, and maximum tolerated pressure were assessed by incrementally increasing ventilation pressures (20–50 cm H₂O).*

Results: *The cyanoacrylate glue + collagen patch group demonstrated 100% sealing integrity at the maximum ventilator pressure (50 cm H₂O) without interface delamination, significantly outperforming other groups. In contrast, fibrin-thrombin glue + patch and latex glue + patch groups exhibited air leakage and patch detachment at 40 cm H₂O and 25 cm H₂O, respectively.*

Conclusion: *This ex vivo model effectively screened material combinations. Cyanoacrylate glue combined with collagen patches exhibited superior high-pressure sealing performance in the ex vivo setting. However, long-term efficacy and biocompatibility require further study.*

Keywords: *ex vivo porcine lung model; pulmonary air leakage; sealants; collagen patches.*

Introduction

Pulmonary air leakage represents a frequent complication following pulmonary resection in thoracic surgery, typically arising from abnormal communication between alveoli of distal bronchioles and the pleural cavity[1]. Air leakage persisting for ≥ 5 days is defined as a prolonged air leak (PAL). PAL is associated with severe complications, including atelectasis, respiratory failure, and pleural empyema [2]. Studies indicate that the incidence of PAL after video-assisted thoracoscopic pulmonary resection ranges from 5% to 26.3% [3, 4], which not only prolongs drainage duration and hospitalization but also elevates risks of infections and economic burdens.

Traditional methods, such as mechanical suture reinforcement or pleurodesis, present limitations, including technical complexity, prolonged procedural time, risks of secondary injury to fragile lung tissue, or suture dehiscence, all of which impair lung re-expansion. These drawbacks are particularly critical in patients with compromised pulmonary function.

Advancements in biomaterials have introduced novel applications for surgical sealants. These materials form a protective layer on wound surfaces, achieving hemostasis and airtight sealing[5]. However, the dynamic properties of the lungs (compliance, volumetric changes) diminish the efficacy of isolated sealant use.

During intraoperative ventilation or coughing, elevated pressure frequently disrupts adhesive integrity.

To enhance stability, a strategy combining sealants with resorbable collagen plates has been proposed to provide mechanical reinforcement. Preliminary data demonstrate improved sealing outcomes [6], however, systematic comparisons of load-bearing capacity among different material combinations remain absent in the literature. Furthermore, the mechanisms of synergistic interaction and the mechanical resilience limits of composite materials under physiological loads remain unclear.

In this study, we selected three representative medical sealants with distinct properties for evaluation:

Acrylate latex

A white, viscous, hydrophilic, homogeneous colloidal composition based on acrylate latex, polyvinyl alcohol (PVA), and pharmacological additives (aminocaproic acid and chlorhexidine). Acrylate latex forms an elastic adhesive layer upon contact with biological tissues. PVA enhances adhesion to histological surfaces. Aminocaproic acid and chlorhexidine provide antimicrobial effects and stimulate tissue regeneration. The hydrophilic properties of the latex adhesive maintain adhesion stability under high-humidity conditions, ensuring effective tissue bonding and airtight sealing.

Fibrin Glue

Contains thrombin, fibrinogen, and factor XIII. Thrombin catalyzes the proteolytic cleavage of fibrinogen into soluble fibrin monomers, followed by activation of factor XIII, which induces cross-linking of fibrin fibers to form a stable clot for mechanical occlusion of tissue defects.

Cyanoacrylate glue

The mechanism of action relies on the high electrophilicity of the carbon atom in the cyano (-CN) and ester (-COOR) groups, amplified by inductive effects. Upon contact with weak nucleophiles (e.g., water or tissue amino groups), anionic polymerization occurs, rapidly curing into a rigid adhesive polymer that creates a durable bond.

Collagen Plate as a Biomechanical Scaffold was additionally employed. It provides a three-dimensional supportive structure that promotes fibroblast infiltration and enhances sealing efficacy[7].

The objective of this study was to establish a standardized model of penetrating pulmonary injury in isolated porcine lungs, simulating clinical mechanical ventilation conditions (PEEP = 5 cm H₂O, I:E ratio = 1:2), to evaluate the sealing properties of individual sealants and their combined application with collagen plates.

To achieve this goal, we assessed the sealing efficacy of surgical adhesives alone and in combination with a collagen plate by developing a standardized ex

vivo model of through-and-through pulmonary defects in isolated porcine lungs, replicating clinically relevant mechanical ventilation parameters (PEEP = 5 cm H₂O, I:E ratio = 1:2).

Materials and Methods

This study employed a standardized model of isolated porcine lungs to evaluate the efficacy of air leak sealing using three sealants (acrylate latex, fibrin-thrombin glue, and cyanoacrylate glue) alone or in combination with collagen biomaterial.

A total of 18 fresh porcine lungs were processed within two hours post-slaughter, including saline lavage, removal of compromised tissues, and storage at room temperature under sterile conditions. In addition to sealants, a resorbable collagen biomembrane (3×3 cm, 0.5 mm thickness), provided by the Biomedical Park of Sechenov University, was utilized. Key equipment included a Mindray Animal Care Veta 5 ventilator and surgical instruments.

The experimental model was established by creating three standardized 2 cm-diameter through-and-through parenchymal defects per lung using a scalpel to simulate clinical alveolo-pleural leakage. Defect localization was randomized across pulmonary lobes, excluding areas adjacent to major vessels or bronchi. Injured lobes were connected to a ventilator with parameters set to respiratory rate 15 cycles/min, inspiratory-to-expiratory (I:E) ratio 1:2, and positive end-expiratory pressure (PEEP) 5 cm H₂O, mimicking clinical mechanical ventilation. Samples were randomized into six groups (n=3/group): sealant-only application groups and combined groups (sealant + collagen plate).

The intervention protocol comprised three phases: pre-treatment, sealant application, and plate fixation. During pre-treatment, defects were irrigated with saline and dried with sterile gauze. Sealants were uniformly applied to the defect surface, followed by polymerization time per manufacturer guidelines: latex adhesive — 5–10 min, fibrin glue — 2–5 min, cyanoacrylate glue — 0.5–1.5 min. In combined groups, collagen plates were applied before complete sealant curing, with sustained pressure applied for 10 seconds to enhance interfacial adhesion.

Sealing efficacy was assessed via a stepwise pressure escalation protocol: initial pressure 20 cm H₂O, incrementally increased by 5 cm H₂O every minute until reaching 50 cm H₂O (maximum ventilator limit). Air leakage was visually identified by continuous bubble formation (≥3 sec) upon saline spray, with maximum tolerated pressure recorded at first leak detection. Plate stability was graded as: Grade 0 — no defects, Grade 1 — edge delamination <10% of area, Grade 2 — significant delamination or detachment. Additional parameters included sealant polymerization time, ease of application, and tissue-material interfacial adhesion strength.

Results

This study evaluated the efficacy of air leak sealing using three sealants alone and in combination with a collagen plate (Fig. 1). The results demonstrated a sta-

tistically significant effect of sealant type and its combination with the plate on maximum tolerated pressure and sealing stability.

Cyanoacrylate glue exhibited the highest performance. When used without the plate, its maximum tolerated pressure reached 40 cm H₂O, surpassing both acrylate latex (20 cm H₂O) and fibrin glue (30 cm H₂O). However, at pressures ≥ 40 cm H₂O, partial sealing failure—manifested as edge delamination or crack formation—was observed across all groups.

The combination of cyanoacrylate glue with the collagen plate demonstrated exceptional efficacy. At the maximum pressure of 50 cm H₂O (the technical limit of mechanical ventilation), this group maintained complete sealing integrity (100% absence of leaks) with no evidence of delamination or plate displacement at the tissue-material interface (stability: Grade 0).

In the fibrin glue with plate group, edge delamination (Grade 1 stability) and localized air bubble formation were recorded at 40 cm H₂O. The least effective combination was acrylate latex with the plate: complete plate detachment (Grade 2 stability) and extensive leakage across the entire defect area were observed as early as 25 cm H₂O.

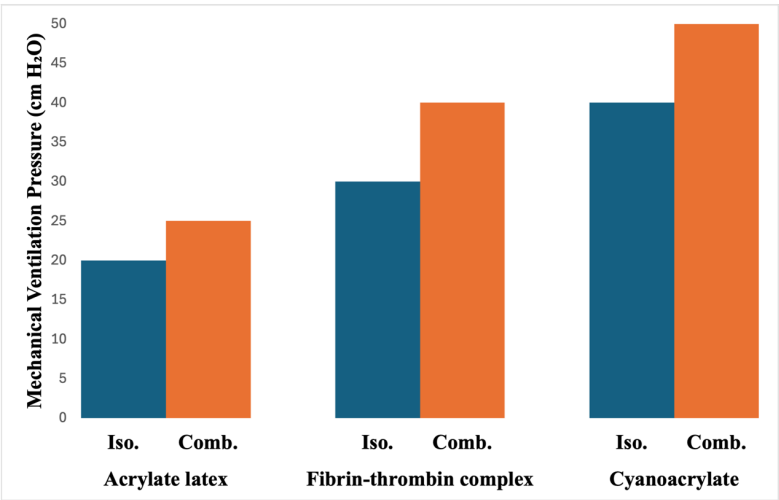


Figure 1. Maximum Tolerated Pressure of Three Sealants, Iso.: Isolated sealant, Comb.: Combination with plate

Rapid polymerization of the cyanoacrylate glue (30–90 seconds) significantly reduced procedural time, while its cyanoacrylate component formed a seamless composite structure with the collagen plate, demonstrating the highest interfacial

adhesion strength. In contrast, fibrin glue—dependent on the fibrinogen-thrombin reaction (polymerization time 120–300 seconds)—exhibited weak interfacial bonding, predisposing to edge delamination of the plate under mechanical stress. Acrylate latex, with the longest polymerization time (300–600 seconds) and low adhesive capacity of acrylate latex, resulted in rapid sealing failure under pressure escalation.

Regarding ease of application, cyanoacrylate glue proved optimal: its application required no adjustments to layer thickness. Conversely, acrylate latex necessitated repeated volume adjustments during application. Notably, cyanoacrylate glue generated minimal heat during polymerization, but no visible tissue damage was observed.

Discussion

This study utilized an *ex vivo* model of isolated porcine lungs to systematically evaluate the efficacy of three sealants alone and in combination with a collagen plate for air leak closure, revealing significant differences in sealing capacity among material combinations under mechanical ventilation. The results demonstrate that the cyanoacrylate glue-collagen plate combination outperformed other groups in pressure resistance (50 cm H₂O) and interfacial stability, attributed to rapid polymerization, high adhesive strength, and mechanical reinforcement provided by the plate.

The cyanoacrylate sealant forms a high-strength adhesive layer within 30–90 seconds via an anionic polymerization mechanism. This property enables adaptation to dynamic intraoperative conditions, creating a rigid film resistant to delamination under high pressure, even on hydrated tissue surfaces[8, 9] When combined with the collagen plate, the robust adhesion of cyanoacrylate ensures seamless integration of the plate with lung tissue, minimizing the risk of mechanical failure due to shear stress. Similar findings were reported by Pascual et al.[10], who demonstrated the efficacy of cyanoacrylate adhesives in reinforcing plate fixation during hernioplasty, reducing postoperative recurrence rates.

The mechanical structure of the collagen plate not only distributes ventilatory pressure but also synergistically enhances short-term sealing and long-term tissue healing. However, despite the absence of visible tissue damage in the experiment, the exothermic reaction during polymerization necessitates caution in clinical settings.

The suboptimal performance of acrylate latex and fibrin-based systems likely stems from their biological properties and polymerization kinetics. Fibrin glue, as a product of the enzymatic fibrinogen-thrombin reaction, is characterized by prolonged polymerization time and forms a fibrin network with low elastic modulus, reducing resistance to cyclic stretching under high ventilatory pressure. An additional factor may be interfacial swelling of the fibrin layer, weakening adhesive

strength at the plate contact zone. Acrylate latex, despite the hydrophilic stability of acrylate latex, exhibits insufficient viscoelasticity to compensate for tensile stresses in pulmonary parenchyma. Particularly critical is the dynamic impact of mechanical ventilation during incomplete material curing, leading to premature plate detachment.

This study has several limitations. The ex vivo model does not fully replicate the dynamic physiological in vivo environment, including blood flow and immune responses. The small sample size may limit the statistical power of the conclusions. Furthermore, long-term effects—such as collagen plate degradation, biocompatibility of residual sealant components, and tissue remodeling processes—were not assessed.

Future studies should expand the sample size and conduct in vivo animal experiments to evaluate long-term sealing efficacy. Concurrent monitoring of biological markers, including inflammatory responses, angiogenesis, and fibrosis at the material application site, is essential. Specific attention must be directed toward investigating tissue thermotolerance when using cyanoacrylate sealants, given their exothermic properties.

Conclusion

This study confirmed that the combination of cyanoacrylate glue with a collagen plate demonstrates superior sealing efficacy under high-pressure conditions in an ex vivo model, where rapid polymerization and high interfacial adhesion strength present a promising solution for clinical air leak management. However, the exothermic properties of cyanoacrylate and its long-term biocompatibility require further in vivo validation to ensure safety and efficacy in clinical applications.

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通过选择自适应天线阵元上最优幅度分布来提高射电源测向精度
**IMPROVING THE ACCURACY OF THE DIRECTION FINDING
OF THE RADIO SOURCE BY SELECTING THE OPTIMAL
DISTRIBUTION OF AMPLITUDES ON THE ELEMENTS OF THE
ADAPTIVE ANTENNA ARRAY**

Baimov Roman Irekovich

Student

South Ural State University

Telezhkin Vladimir Fedorovich

Professor

South Ural State University

摘要.研究了新型最优幅度分布在无线电测向仪AFAR单元中的应用。幅度分布的选择应遵循以下准则：AFAR辐射方向图（RP）中存在零点和最大值；最小化总RP旁瓣和差值RP的最大电平，同时使AFAR总RP主瓣的角扩展最小；以及单脉冲方位法鉴别特性的陡度最大。这些准则可提高射电源角坐标的确定精度。

关键词：自适应相控阵天线，幅度权重分布，辐射方向图，无线电测向仪，角坐标，射电发射源。

Abstract. *The application of new optimal amplitude distributions on AFAR elements in the radio direction finder is investigated. The choice of amplitude distributions according to the criteria: the presence of zero and maximum in the AFAR radiation pattern (RP), minimizing the maximum level of the side lobes of the total and difference RP with a minimum angular expansion of the main lobe of the total RP of the AFAR and the maximum steepness of the discriminatory characteristic of the monopulse bearing method improves the accuracy of determining the angular coordinates of the radio source.*

Keywords: *adaptive phased array antenna, amplitude weight distribution, radiation pattern, radio direction finder, angular coordinates, radio emission source.*

The formation of amplitude distributions based on optimality criteria makes it possible to reduce the level of the side lobes and reduce the width of the main lobe of the bottom. This helps to increase the noise immunity of an open communication channel. The change in the vector of weighting coefficients (VWC) from the

initial state to the optimal one (w_{opt}) depends on the chosen optimality criterion [1-4].

The choice of an optimality criterion is closely related to an indicator that quantifies the quality of reception of a useful signal against interference. The objective function describes how the quality indicator changes depending on the values of the weighting amplitude coefficients. The extremum of the objective function is an optimality criterion that can be achieved by optimizing the weighting function.

Table 1 defines the optimal VWC (w_{opt}) depending on the optimality criterion.

Table 1.
VWC (w_{opt}) by optimality criteria

The criterion of optimality	w_{opt}
Optimal with total petal width	$w_{opt} = \frac{\sin(\pi n / N)}{(\pi n / N)}$
Optimal with minimal lateral lobe energy	$w_{opt} = \exp\left\{-\frac{[\sin(\pi n / N)]^2}{2\sigma^2}\right\}$
Optimal with the minimum sum of pedestal squares	$w_{opt} = \begin{cases} 1, & \text{if } n = 0; \\ \frac{\sin[(\pi n / N) / 2]}{[(\pi n / N) / 2]}, & \text{if } n > 0 \end{cases}$
Optimal with a minimum area under the curve of the radiation pattern	$w_{opt} = \sqrt{\frac{2}{N}} \cdot \cos\left(\frac{\pi n}{N}\right)$
Optimal phase mismatch with minimal amount	$w_{opt} = \cos\left(\frac{\pi n}{N}\right) + j \cdot \sin\left(\frac{\pi n}{N}\right)$
The optimal one with the least power on the pedestal	$w_{opt} = \sqrt{\frac{2}{N}} \cdot \cos\left(\frac{\pi n}{N}\right) \cdot \exp\left\{-j \cdot \sin\left(\frac{\pi n}{N}\right)\right\}$

Figures 1 and 2 show calculations of total and difference radiation patterns(RP) for previously unexplored optimal amplitude distributions.

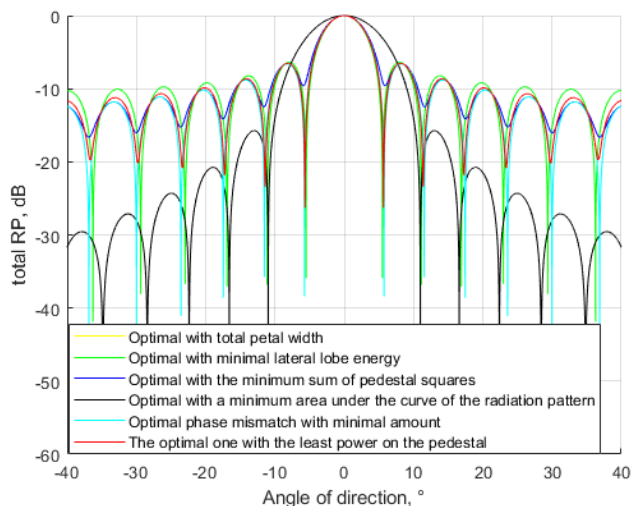


Figure 1. The results of calculations of the total radiation patterns of the AFAR according to the criteria of optimality of amplitude distributions

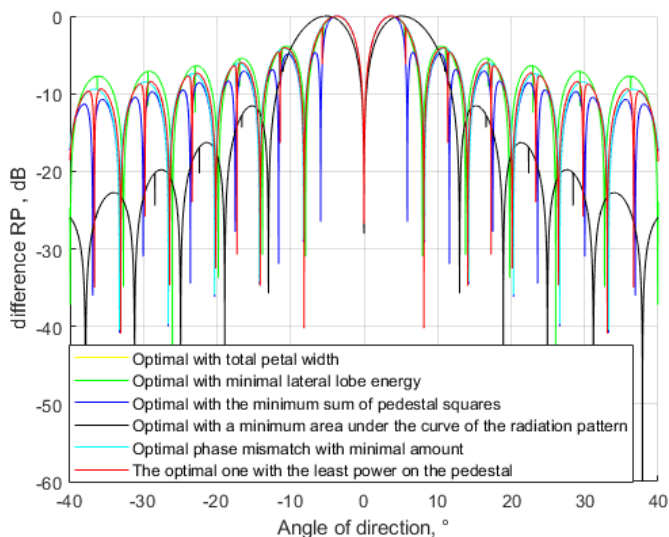


Figure 2. The results of calculations of the difference radiation patterns of the AFAR according to the criteria of optimality of amplitude distributions

The analysis of the results is summarized in Table 2.

Table 2.
Comparison of amplitude distributions

The criterion of optimality	The width of the main lobe, deg.	Side lobe level total RP, dB	Side lobe level difference RP, dB
Optimal with total petal width	2,1	-8,78	-5,9
Optimal with minimal lateral lobe energy	2,15	-8,77	-5,9
Optimal with the minimum sum of pedestal squares	2,35	-8,89	-7,03
Optimal with a minimum area under the curve of the radiation pattern	3,5	-15,74	-11,6
Optimal phase mismatch with minimal amount	2,22	-8,89	-6,05
The optimal one with the least power on the pedestal	2,18	-8,86	-6,01

The formation of deep zeros in the AFAR radiation pattern consists in assessing and determining the direction of useful and interfering radio sources. By adapting the amplitude distributions on the AFAR elements, it is possible to achieve increased noise immunity of the communication channel from intentional interference.

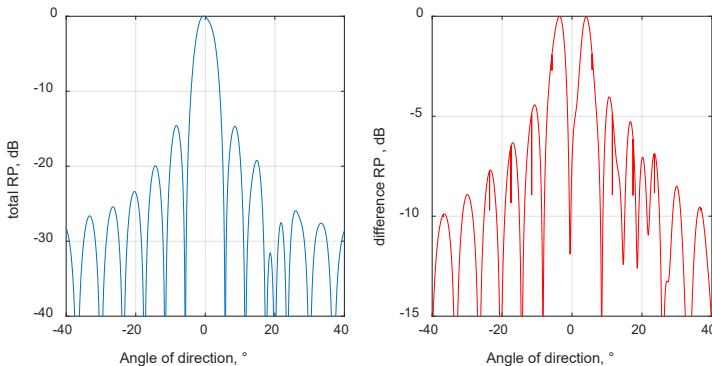


Figure 3. The results of RP calculations with zero in the direction of interference

Wide dips in the radiation pattern in the direction of interference are formed in AFAR by using adaptive signal processing algorithms. Adaptive signal processing algorithms are used to adjust the phases and amplitudes of the AR elements in

accordance with the direction of interference suppression in a given wide angular sector. The sector selected for the simulation is in the direction of $[-80^\circ; 30^\circ]$. Changes in this sector will not affect the simulation results.

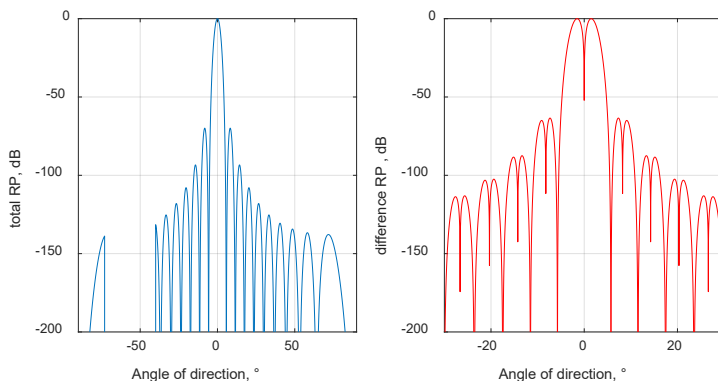


Figure 4. The results of RP calculations with wide dips in the interference direction

In the course of the study, based on the results of the analysis of the data shown in Table 2 and the results of the graph analysis (Fig. 1-4), it can be concluded that the method of forming zeros and wide dips in RP AFAR with an optimal weight amplitude distribution on the elements in the form of a distribution with the lowest power on a pedestal on the AFAR elements implements criteria for accurate direction finding a radio source in conditions of high interference load in a given angular sector. This is due to the fact that the level of the side lobes of the directional control panel, responsible for noise immunity, is minimal.

The method of forming wide dips in RP AFAR makes it possible to effectively simultaneously suppress several sources of interference acting from different angular directions.

The results of the study can be used to optimize and improve the operation of a radio direction finder as part of a radiocarbon dating system.

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北海航线对俄中贸易的影响

THE IMPACT OF THE NORTHERN SEA ROUTE ON RUSSIAN-CHINESE TRADE

Lebedeva Natalia Sergeevna

Senior Lecturer

Admiral F. F. Ushakov State Maritime University

Popov Anatoliy Nikolaevich

Doctor of Technical Sciences, Associate Professor, Head of Department

Admiral F. F. Ushakov State Maritime University

摘要: 北方海航道 (NSR) 是连接欧洲和亚洲经北冰洋的重要国际贸易路线。近年来, 各国, 尤其是俄罗斯和中国, 对这条航线的兴趣日益浓厚。本文从经济、地缘政治和环境角度分析了北方海航道对中俄贸易的影响。

关键词: 北方海航道、中俄贸易、物流、经济合作、效率、自然资源。

Abstract. *The Northern Sea Route (NSR) is an important route for international trade connecting Europe and Asia via the Arctic Ocean. In recent years, there has been growing interest in this route, especially from Russia and China. This article analyzes the impact of the NSR on Russian-Chinese trade, considering economic, geopolitical and environmental aspects.*

Keywords: *Northern Sea Route, Russian-Chinese trade, logistics, economic cooperation, efficiency, natural resources.*

The Northern Sea Route (NSR) is an important route for international trade connecting Europe and Asia via the Arctic Ocean. In recent years, there has been growing interest in this route, especially from Russia and China. This article analyzes the impact of the NSR on Russian-Chinese trade, considering economic, geopolitical and environmental aspects.

Economic aspects.

The Northern Sea Route (NSR) is an important route for international trade, which opens up new economic opportunities for both Russia and other countries. This route, which runs along the northern coast of Russia, reduces the time and distance of cargo delivery between Europe and Asia. However, its development is also associated with a number of challenges and risks [2]. Let's consider the main economic aspects of the NSR in more detail.

1. Reducing the time and cost of transportation.

The NSR can significantly reduce the time of cargo delivery compared to traditional routes through the Suez Canal. It is estimated that travel time can be reduced by 30-40%, making this route more attractive for business.

Reduced fuel costs: The shorter distance also leads to lower fuel consumption, which is an important factor for shipping companies. This can reduce overall transportation costs and increase the competitiveness of goods.

2. Increased trade volumes.

With the increase in cargo flow through the NSR, there has been an increase in the volume of Russian-Chinese trade. According to the Federal Customs Service of Russia, in 2022, the volume of trade between the countries reached record levels, which is due to the active use of the new sea route. New Trade Routes: The opening of the NSR creates new opportunities for trade between Europe, Asia and North America. This can increase cargo volumes and create new markets for goods.

Export of Natural Resources: Russia, with significant reserves of oil, gas and other natural resources, can use the NSR to export them. This can help strengthen the country's economic position on the international stage.

3. Development of Arctic infrastructure.

Investment in infrastructure: Russia is actively developing ports and infrastructure along the NSR, which creates additional opportunities for Chinese companies. Projects such as the creation of new terminals and the modernization of existing ports help increase the throughput capacity of the route.

Investment in ports and logistics: To effectively use the NSR, it is necessary to develop port infrastructure and logistics centers. This requires significant investment, which can be directed from both the public and private sectors [3].

Creation of new jobs: Infrastructure development will create new jobs in the Arctic regions, which can lead to economic growth and an improvement in the standard of living of the local population.

4. Attracting foreign investment.

International cooperation: The development of the NSR can attract foreign investment to the Arctic region. Countries interested in using this route can invest in infrastructure and technology, which will contribute to the development of the region's economy.

Establishment of joint ventures: The possibility of creating joint ventures between Russian and foreign companies can facilitate the exchange of technology and improve business efficiency.

5. Economic risks and challenges.

The development of the NSR is associated with environmental risks that can affect the long-term sustainability of the region's economy. Oil spills, water pollution and destruction of ecosystems can have serious consequences for fisheries and tourism.

Geopolitical instability: The political situation in the Arctic can affect the use of the NSR. Conflicts of interest between countries can lead to restrictions on shipping or increased security costs.

6. Development Prospects

Sustainable Development of Shipping: The introduction of environmentally friendly technologies in shipping can help minimize the negative impact on the environment and ensure long-term economic sustainability.

Tourism Development: The NSR can become not only a trade route, but also a tourist destination. An increase in the number of cruise ships and tourist expeditions to the Arctic can become an additional source of income for the region.

Geopolitical Aspects.

The Northern Sea Route (NSR) is not only an important trade route, but also a key element of the geopolitical strategy in the Arctic region. Its development affects the interests of many countries, which leads to complex dynamics of international relations. Let's consider the main geopolitical aspects associated with the NSR.

1. Geostrategic Importance.

Increasing Russian Influence: The NSR runs along the northern coast of Russia and provides the country with a strategic advantage in controlling one of the shortest routes between Europe and Asia. Russia is actively developing infrastructure and strengthening its naval power in the region, which allows it to strengthen its position as a leading power in the Arctic [4].

Competition for resources: The Arctic is rich in natural resources, including oil, gas, minerals and fishing grounds. Control over the NSR gives Russia access to these resources and the ability to export them, which is of interest to other countries such as the United States, Canada and the European Union.

2. International relations and conflicts.

Confrontation with the West: The development of the NSR occurs against the backdrop of tensions in relations between Russia and the West. Sanctions and political isolation of Russia may affect its ability to develop the NSR and attract investment. At the same time, Western countries are seeking to secure their interests in the Arctic, which may lead to conflicts.

Arctic Council: The Arctic Council, which includes eight countries (Russia, the United States, Canada, Norway, Denmark, Sweden, Finland and Iceland), plays an important role in regulating cooperation and resolving disputes in the region. However, its capabilities are limited as it does not have the power to enforce decisions.

3. Military aspects.

Militarization of the Arctic: Russia is increasing its military presence in the Arctic, creating new bases and upgrading existing ones. This is causing concern

among other countries, which are also starting to increase their military capabilities in the region.

Shipping security: With the increase in cargo traffic along the NSR, there is a need to ensure shipping security. This includes both countering piracy and protecting against potential military threats.

4. Environmental and legal aspects

Environmental challenges: The development of the NSR can lead to environmental disasters, which creates additional challenges for the international community. Conflicts of interest can arise due to differences in approaches to environmental protection.

Legal issues: Questions about the right to use sea routes and resources remain open. The United Nations Convention on the Law of the Sea (UNCLOS) regulates many aspects, but the interpretation of its rules can cause disputes between states [1].

5. Economic cooperation and competition.

Investment and partnership: Many countries are interested in investing in the NSR infrastructure. This creates opportunities for economic cooperation, but also creates competition for control over routes and resources.

Alternative routes: Other countries, such as China, are considering creating alternative trade routes, which could reduce dependence on the NSR and increase competition for influence in the region.

6. Development prospects.

The future of international cooperation: Sustainable development of the NSR requires international cooperation to address security, environmental and legal issues. This could become the basis for new forms of diplomacy in the Arctic.

The role of new players: Countries without direct access to the Arctic (such as China) are actively showing interest in the NSR and could become important players in the Arctic arena. This could change the balance of power and influence the strategy of Russia and other Arctic powers.

Environmental aspects.

The Northern Sea Route (NSR) opens up new opportunities for international trade, but its development is also associated with a number of environmental risks and challenges. In the context of climate change and melting Arctic ice, it is important to consider the potential impacts on the environment. The key environmental aspects associated with the use of the NSR are presented below.

1. Environmental risks.

The development of the NSR is associated with potential environmental risks, including marine pollution and threats to Arctic ecosystems. Measures are needed to protect the environment and ensure sustainable development in the region.

Oil and chemical spills: Increased shipping along the NSR increases the risk of oil spills and other hazardous substances. Given that the Arctic is a fragile

ecosystem, spills can have catastrophic consequences for marine organisms and ecosystems.

Shipping waste: Vessels transiting the NSR can discharge waste, including plastic, sewage and other pollutants. This can lead to deterioration of water quality and negative impacts on marine flora and fauna.

Habitat change: Infrastructure development along the NSR, including ports and logistics hubs, can destroy natural habitats for many species, such as polar bears, seals and seabirds.

Impact on biodiversity: Increased shipping can alter animal migration routes and disrupt their natural habitats. It also increases the risk of introducing invasive species that could threaten local ecosystems.

3. Climate change.

Carbon emissions: While the NSR can reduce the distance and time it takes to ship cargo, increased shipping also increases carbon emissions from ships. This can exacerbate the problem of climate change and affect the melting of ice in the Arctic.

Melting permafrost: Infrastructure construction in the Arctic can contribute to the melting of permafrost, releasing greenhouse gases such as methane, further exacerbating climate change. Melting ice offers new opportunities for shipping, but also highlights the importance of combating climate change. Russia and China must consider the environmental impact of their activities along the NSR.

4. Legal and governance aspects.

Shipping regulation: The need to create strict environmental standards and rules for shipping along the NSR is becoming increasingly urgent. This includes requirements for ships to reduce emissions and prevent pollution.

International cooperation: Effective management of environmental risks requires international cooperation between countries using the NSR. The establishment of joint programs for monitoring and protecting ecosystems can help minimize negative impacts.

5. Sustainable development

Green logistics: Implementing sustainable development principles in shipping can help reduce negative impacts on the environment. This includes the use of cleaner technologies and alternative energy sources.

Environmental impact assessment (EIA): Before implementing major projects in the Arctic region, thorough environmental impact assessments must be carried out to identify potential risks and develop mitigation measures.

Thus, the Northern Sea Route is a key element in the development of Russian-Chinese trade. Its use contributes to economic growth, strengthens bilateral relations and creates new business opportunities. However, it is necessary to take into account environmental risks and geopolitical aspects to ensure the sustainable de-

velopment of this important transport corridor. In the future, the NSR may become one of the main routes for international trade, which will require joint efforts from participating countries to use it effectively and safely. Moreover, the development of the Northern Sea Route opens up new economic opportunities, but it is necessary to take into account the serious environmental risks associated with its use. To ensure sustainable development of the region, it is important to implement effective environmental protection measures, regulate shipping activities and develop international cooperation. This is the only way to minimize the negative impact on fragile Arctic ecosystems and ensure their preservation for future generations. The Northern Sea Route represents significant economic potential for Russia and other countries, but its development requires an integrated approach taking into account both economic opportunities and environmental risks. Effective resource management, infrastructure investment and international cooperation can help maximize the benefits of the NSR while minimizing negative environmental impacts.

The geopolitical aspects of the Northern Sea Route have many facets and represent a complex picture of the interaction of interests of various countries. Given the growing importance of the Arctic as a region with unique resources and strategic routes, the further development of the NSR will depend on the ability of the international community to find compromises and resolve emerging conflicts.

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噬菌体是食品生产中控制致病菌的有前景的工具

BACTERIOPHAGES AS A PROMISING TOOL FOR SANITARY CONTROL OF PATHOGENIC BACTERIA IN FOOD PRODUCTION

Frolova Darya Dmitrievna

Student

Kolberg Natalia Alexandrovna

*Candidate of Veterinary Sciences, Associate Professor
Ural State University of Economics*

摘要. 本文全面分析了噬菌体在食品工业中对抗大肠杆菌和柠檬酸杆菌属致病菌的应用。文中探讨了噬菌体的作用机制及其应用技术。

关键词: 噬菌体、食品致病菌、致病菌、消毒、食品安全。

Abstract. *This article presents a comprehensive analysis of the use of bacteriophages to combat pathogenic bacteria of the genus Escherichia coli and Citrobacter in the food industry. The mechanisms of phage action and technological aspects of their application are considered.*

Keywords: *Bacteriophages, food pathogens, pathogenic bacteria, disinfection, food safety.*

Food production facilities face the risk of microbiological contamination of products every day. Millions of cases of food poisoning caused by pathogenic bacteria are registered annually [1]. In particular, enteropathogenic strains of *Escherichia coli* (especially O157:H7) and *Citrobacter* spp. pose a serious threat to food safety, since *E. coli* O157:H7 causes hemorrhagic colitis and hemolytic uremic syndrome (mortality rate of 3-5%), and *Citrobacter* spp. produces heat-stable enterotoxins and causes gastroenteritis [2]. The main sources of infection with these pathogens for humans are improperly processed meat products, as well as insufficiently pasteurized milk and dairy products.

The problem for food production is that traditional disinfection methods (chemical and heat treatment) are not always effective and can affect the organoleptic qualities of products and develop resistance in microorganisms.

Studies in recent years to analyze the instability of antibacterial drugs to pathogenic microorganisms have shown that some antibiotics, such as benzpenicillin, lincomycin and ampicillin, demonstrate zero effectiveness against *Escherichia*

coli, although back in 2020, lincomycin showed excellent results, up to 100%. Here we can conclude how much microorganisms have developed resistance to these antibiotics [3]. An alternative to traditional processing methods are bacteriophages - viruses that selectively destroy bacteria, but are safe for humans. Their use opens up new opportunities for the food industry.

Bacteriophages are obligate intracellular viruses that have strict specificity to bacterial cells. As the most ancient and widespread group of viruses, bacteriophages demonstrate quantitative predominance in the biosphere - modern studies estimate their population at over 10^{30} particles. It should also be noted that the average ratio of phage particles to bacterial particles is approximately 10:1.

The structure of these microorganisms includes a capsid (protein shell), nucleic acid - DNA or RNA and receptor proteins that allow them to recognize the host. The action of bacteriophages on bacterial cells consists of several stages: adsorption on specific receptors of the bacterium, injection of its genetic material, replication of viral components and lysis of the cell with the release of 50-200 new phage particles [4].

Although bacteria are capable of developing resistance to antibiotics and chemical disinfectants, resistance to bacteriophages develops much more slowly or does not form at all. This is explained by several key factors.

Thus, the coevolutionary interaction of bacteriophages and bacteria is manifested as follows: bacterial mutations (changes in receptors, CRISPR systems) can temporarily protect them from phages, but the latter evolve faster (high mutation rate, horizontal gene transfer) and adapt to new bacterial strains. Consequently, if a bacterium develops protection in the form of a mutation, phages quickly find a new way of infection.

The next factor that counteracts resistance is the diversity of infection mechanisms. Bacteriophages use different attack strategies, for example: one phage can bind to several structures on the surface of the bacterium (flagella, LPS, outer membrane proteins); lysis enzymes (endolysins and cholsins) produced by bacteriophages are able to destroy the cell wall of bacteria, despite the change in their primary receptor. For example, *E. coli* can lose the OmpC receptor, but the T4 phage mutates and begins to bind to OmpF. It is also possible to use a mixture of bacteriophages (3-5 types), which reduces the likelihood of resistance. An example of a commercial drug is EcoShield™ against *E. Coli* O157:H7, containing 3-6 phages with different mechanisms of action [5].

The advantages of using bacteriophages in food production include their safety. Being highly specific viruses that affect only bacterial cells, these microorganisms are safe for humans, animals, plants and the environment. The key aspects of their safety are listed below.

Bacteriophages are distinguished by their inability to infect eukaryotic cells, since they are evolutionarily adapted to recognize prokaryotic receptors (for ex-

ample, LPS in gram-negative bacteria, teichoic acids in gram-positive bacteria) - human and animal cells do not have molecular “targets” for phage adsorption. This means that when ingested (with food or inhaled), phages do not interact with blood or tissue cells, do not penetrate epithelial barriers and are quickly eliminated by the immune system (phagocytosis by macrophages). The lack of toxicity of bacteriophages is explained by the harmlessness of their structural components: the proteins of the capsid and tail appendage are not toxic even in high concentrations, they are destroyed in the gastrointestinal tract to amino acids (like any food proteins), the nucleic acids of phages (DNA / RNA) do not affect the human genome. Studies have shown that bacteriophages do not cause allergic reactions, intestinal microbiota disorders and are not mutagenic or carcinogenic to the human body. It should be noted that bacteriophages are also safe from an environmental point of view, since they are naturally present in all ecosystems (water, soil, human body), after performing their function - the destruction of target bacteria, they are destroyed by proteases and nucleases and do not accumulate in the environment. And also, unlike antibiotics and chemical disinfectants, they do not suppress beneficial microflora (lacto- and bifidobacteria), and therefore do not cause dysbacteriosis. Bacteriophage-based preparations destroy only target pathogens, without affecting saprophytic bacteria, soil and aquatic microorganisms [6].

The use of bacteriophages to destroy pathogenic bacteria in the food industry is possible at various stages of production.

Primary processing of raw materials at meat processing plants may include irrigation of animal carcasses with preparations containing bacteriophages against *E. coli* before cutting; processing of by-products and bones. At poultry farms, carcasses can be immersed in phage solutions (against *Campylobacter*).

For processing equipment, it is possible to irrigate conveyor lines, disinfect cutting tools, cutting tables, pipelines and tanks.

It also seems promising to use bacteriophages at the final stages of production: application to finished products, spraying meat products, coating cheeses and sausages; integration into packaging as antimicrobial films with immobilized phages [7].

The use of bacteriophages to combat pathogenic bacteria, in particular (*E. coli*), is a promising, safe and effective alternative to traditional disinfection methods in the food industry. Their use reduces the risk of food poisoning and maintains the quality of products. Bacteriophages remain effective and have a number of advantages over antibiotics, eliminating the emergence of pathogen resistance. These microorganisms are safe, as they have biological characteristics (inability to infect humans), lack of toxicity even with prolonged use and are environmentally neutral. Also, the use of drugs containing bacteriophages is possible at all stages of production, which allows you to create an effective barrier against pathogens throughout the production cycle.

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