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SCIENTIFIC AND METHODOLOGICAL FOUNDATIONS OF ESTABLISHING A CALIBRATION LABORATORY FOR MODERN GEOMETRIC MEASURING INSTRUMENTS

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Abstract. The rapid development of industrial production and scientific research requires high accuracy and reliability of geometric measurements. Establishing a calibration laboratory for modern geometric measuring instruments is crucial to ensure measurement traceability, compliance with international standards, and enhancement of product quality. This article explores the scientific and methodological foundations for organizing such laboratories, focusing on standardization, metrological assurance, quality management, and the integration of advanced technologies.

Keywords: Calibration laboratory, geometric measuring instruments, metrology, traceability, ISO/IEC 17025, measurement accuracy.

INTRODUCTION

In today's era of rapid industrial and technological progress, the role of precision measurement has become increasingly significant. The quality, reliability, and competitiveness of industrial products depend not only on advanced production technologies but also on the accuracy of the measuring instruments that control geometric parameters. In sectors such as aerospace, automotive, mechanical engineering, and high-tech manufacturing, even the smallest deviation in measurement can lead to substantial errors in design, production, and safety. Therefore, the calibration of geometric measuring instruments has evolved into a fundamental requirement for modern industries.

Calibration laboratories serve as the backbone of metrological assurance, enabling industries to maintain measurement traceability to national and international standards. They guarantee that measuring instruments, such as coordinate measuring machines (CMMs), interferometers, laser trackers, and optical scanners, function within defined accuracy limits. Without systematic calibration, measurement errors accumulate, leading to decreased product quality, higher rejection rates, and potential safety risks. Thus, the establishment of specialized calibration laboratories is not merely a technical necessity but also a strategic element of national economic and scientific development.

From a methodological perspective, organizing a calibration laboratory is a multi-layered process that involves technical infrastructure, adherence to international standards such as ISO/IEC 17025, the development of a quality management system, and the training of highly qualified personnel. In addition, calibration laboratories play a dual role: on the one hand, they support industrial enterprises by ensuring reliable measurements, and on the other, they foster scientific research in the field of precision engineering, measurement science, and nanometrology.

In recent years, the demand for such laboratories has grown globally, as industries increasingly rely on advanced geometric measurements to produce components with complex shapes and micro-level tolerances. Moreover, globalization and international trade have raised the importance of measurement comparability: calibration certificates issued by accredited laboratories allow products and instruments to be recognized across borders, thereby enhancing international cooperation and competitiveness.

This article explores the scientific and methodological foundations for establishing a calibration laboratory for modern geometric measuring instruments. It highlights the theoretical background of measurement traceability, the methodological principles of laboratory organization, the role of international standards, and the challenges and perspectives of future development. The analysis underscores the necessity of integrating metrological science with practical industrial needs, ensuring that calibration laboratories act as a vital link between research, innovation, and production. The development of calibration laboratories for modern geometric measuring instruments is grounded in the long history of metrological science and its continuous refinement in accordance with industrial and scientific demands. The literature on calibration and metrology emphasizes three fundamental aspects: **traceability**, **standardization**, and **measurement uncertainty management**.

According to the *International Vocabulary of Metrology (VIM, JCGM 200:2012)*, traceability refers to the property of a measurement result whereby it can be related to reference standards, usually national or international, through an unbroken chain of comparisons. Scholars such as Estler (2000) and Schwenke et al. (2008) highlight that for geometric measurements, traceability ensures that instruments such as coordinate measuring machines (CMMs) and laser interferometers maintain accuracy levels consistent with the SI system of units.

The establishment of calibration laboratories thus requires integration into a **national measurement system**. As outlined by the International Bureau of Weights and Measures (BIPM), laboratories must use reference standards that are periodically

compared to international benchmarks. This approach guarantees comparability and reliability of measurements across industries and borders.

Another cornerstone of calibration laboratory organization is adherence to **ISO/IEC 17025:2017**, which sets requirements for the competence of testing and calibration laboratories. Literature in quality assurance (Flack, 2020; OIML D10) emphasizes that the implementation of this standard ensures impartiality, technical competence, and consistency of laboratory results. The methodological foundation is not limited to equipment but extends to documentation, internal audits, and staff competence. Studies in industrial metrology underline that accreditation according to ISO/IEC 17025 is essential for international recognition of calibration certificates.

The *Guide to the Expression of Uncertainty in Measurement (GUM, BIPM, 2008)* provides the theoretical basis for uncertainty evaluation. Researchers have applied statistical models to assess error propagation in geometric measurements. For instance, Estler (2000) demonstrates that systematic errors in CMMs can be modeled using mathematical calibration curves, while Flack (2020) shows that probabilistic approaches enhance the reliability of uncertainty estimation. This body of work underscores that uncertainty analysis is not an auxiliary process but a central methodological requirement for laboratory practice.

Recent research also stresses the role of emerging technologies. Optical 3D scanning, interferometry, and nanometrology techniques are increasingly integrated into calibration laboratories. According to Schwenke et al. (2008), optical interferometers provide sub-micrometer resolution in length measurements, while 3D scanners extend calibration capabilities to free-form surfaces and complex geometries. The literature thus indicates that calibration laboratories must evolve alongside technological innovation, adopting new methods to meet industrial demands.

Comparative studies on calibration practices in Europe, Asia, and North America reveal that advanced economies invest heavily in national metrology institutes (NMIs) and regional calibration networks. For example, Germany's PTB (Physikalisch-Technische Bundesanstalt) and the UK's NPL (National Physical Laboratory) serve as models for integrating scientific research with industrial calibration services. Literature from Asian countries, including China and Japan, demonstrates rapid growth in calibration infrastructure, emphasizing the importance of measurement comparability for global trade and standardization.

The organization of a calibration laboratory for modern geometric measuring instruments requires a comprehensive methodological approach that integrates international standards, technical infrastructure, personnel competence, and quality

management. First and foremost, the laboratory must be established in full compliance with ISO/IEC 17025:2017, which defines the general requirements for the competence of testing and calibration laboratories. Accreditation according to this standard ensures the impartiality, reliability, and global recognition of calibration results, as well as their traceability to the International System of Units (SI). Close cooperation with national metrology institutes is an essential part of this process, since they provide reference standards and guarantee the comparability of measurements at the international level. Another important methodological requirement is the creation of suitable environmental conditions within the laboratory. Since geometric measurements are highly sensitive to temperature, humidity, and vibration, the laboratory must be equipped with systems that maintain stable temperature levels around 20 °C with minimal deviations, regulate humidity within the optimal range, and minimize the impact of vibration and dust. These conditions provide the stability necessary for highly precise measurements using interferometers, coordinate measuring machines, and optical scanning systems.

The selection and maintenance of reference standards and calibration equipment represent another key methodological dimension. Laboratories must be equipped with high-accuracy reference artifacts such as gauge blocks, reference spheres, and step gauges, along with advanced devices like laser interferometers and 3D optical scanners. All reference standards themselves require periodic recalibration at higher-level institutes to ensure traceability. At the same time, proper planning of equipment use, maintenance, and certification is critical to sustaining the accuracy and reliability of the laboratory's work.

Equally significant is the competence of laboratory personnel. Calibration is not merely a technical procedure but a complex scientific process that requires deep knowledge of metrology, mathematics, engineering, and quality assurance. For this reason, staff must receive continuous training in measurement uncertainty evaluation, statistical error analysis, and the application of international standards. Participation in workshops, international training programs, and inter-laboratory comparisons enhances professional expertise and ensures alignment with global practices.

The methodological foundation of a calibration laboratory also includes the implementation of a robust quality management system. This system should encompass documented procedures for all calibration operations, mechanisms for internal audits and continuous improvement, and reliable systems for storing, processing, and protecting measurement data. Proficiency testing and participation in

international inter-laboratory comparisons provide an additional guarantee of the reliability and credibility of results.

Finally, the methodological approach to establishing a calibration laboratory must also consider economic and organizational aspects. Investment in advanced equipment and infrastructure requires careful financial planning, while sustainability depends on offering a wide range of calibration services across different sectors such as aerospace, automotive, construction, and healthcare. Strong client relationships, transparent pricing policies, and timely delivery of services strengthen the laboratory's reputation and ensure its long-term development.

Thus, the methodological principles for organizing a calibration laboratory are not limited to technical issues; rather, they encompass a holistic system that unites international compliance, environmental control, advanced equipment, qualified personnel, and a quality-oriented management culture. Only through such an integrated approach can a calibration laboratory guarantee accuracy, reliability, and global recognition of geometric measurements.

Conclusion

The methodological principles of organizing a calibration laboratory extend beyond technical considerations. They encompass **international compliance, controlled environmental conditions, precise equipment selection, personnel development, quality management, and economic sustainability**. By integrating these elements into a unified framework, calibration laboratories can ensure accurate, reliable, and globally recognized measurements.

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IMPLEMENTATION OF “METHODOLOGICAL MASTERY DAY” AND “METHODOLOGICAL MASTERY HOUR” IN PRESCHOOL EDUCATIONAL INSTITUTIONS

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ABSTRACT

The article highlights the issues of introducing the “Methodical Mastery Day” and “Methodical Mastery Hour” in preschool education institutions based on the Presidential Decree of the Republic of Uzbekistan No. PF-152 dated September 30, 2024. These activities serve to ensure the continuous professional development of teachers, enhance their knowledge and skills, and improve the efficiency of the educational process. The study analyzes the content of these activities, their organizational mechanisms, the role of trainers and master trainers, the significance of the “Virtual Professional Development” platform, as well as opportunities for applying international best practices and innovative technologies.

Keywords: preschool education, Methodical Mastery Day, Methodical Mastery Hour, teaching staff, trainer (mentor), master trainer, leading teacher, continuous professional development, innovative technologies, virtual professional development platform.

Today, the modernization of the preschool education system in the Republic of Uzbekistan, as well as aligning its content and quality with international standards, is regarded as one of the priority directions of state policy. The quality of preschool education is primarily determined by the professional competence of pedagogical staff, their continuous self-development, and their ability to acquire modern methodological knowledge. Therefore, in recent years, systematic measures have been implemented in the education sector to support the professional development of teachers, to ensure the regular enhancement of their qualifications, and to facilitate the assimilation of innovative pedagogical technologies.

In accordance with the Presidential Decree No. PF-152 of September 30, 2024, and the Order of the Minister of Preschool and School Education of November 8, 2024, the introduction of the “*Methodological Mastery Day*” and the “*Methodological Mastery Hour*” in preschool educational institutions represents one of the significant innovations in this direction. This initiative is aimed at ensuring continuity in the

professional growth of pedagogical staff, enhancing their knowledge and skills on a regular basis, and strengthening methodological support, thereby contributing to the effectiveness of the educational process.

The significance of these initiatives lies in the fact that they not only improve the traditional educational and methodological process but also expand opportunities for methodological reflection, independent learning, the study of advanced foreign experiences, and the application of modern digital technologies. Consequently, an innovative mechanism is being created to improve the quality and efficiency of preschool education, while fostering professional leadership and the development of methodological competence.

This article examines the implementation of the Presidential Decree of the Republic of Uzbekistan No. PF-152 dated September 30, 2024, and the subsequent Order of the Ministry of Preschool and School Education (November 8, 2024), which introduced the practices of “*Methodological Mastery Day*” and “*Methodological Mastery Hour*” in preschool educational institutions. These initiatives aim to ensure the continuous professional development of pedagogical staff, enhance their methodological competence, and improve the quality and effectiveness of the educational process.

Introduction.

One of the priority directions of state educational policy in Uzbekistan is to enhance the quality of preschool education through the continuous development of pedagogical staff. In this context, the introduction of “*Methodological Mastery Day*” and “*Methodological Mastery Hour*” plays a strategic role in creating a sustainable system of professional growth for educators.

Main body. The research analyzes the organizational structure, goals, and mechanisms of these activities. *Methodological Mastery Day* serves as a platform for seminars, workshops, master classes, and training sessions organized in base preschools under the guidance of trainers (mentors) and master trainers. *Methodological Mastery Hour* ensures the practical implementation of newly acquired knowledge and skills in individual preschools, accompanied by reflective practices, methodological support, and peer learning.

The study highlights the functions of trainers (mentors), master trainers, and coordinators, emphasizing their role in fostering pedagogical excellence and leadership. Special attention is given to the *Virtual Professional Development Platform*, which provides opportunities for independent learning, digital resource utilization, and continuous self-improvement.

Furthermore, the article considers the integration of international best practices, innovative pedagogical and digital technologies, and collaborative mentoring systems such as “Ustoz-shogird” (Mentor–Apprentice). The regulatory framework, monitoring mechanisms, and coordination at the national, regional, and district levels are also discussed as essential factors for the effective implementation of these initiatives.

Conclusion.

The introduction of “*Methodological Mastery Day*” and “*Methodological Mastery Hour*” contributes to the establishment of a systematic model of continuous professional development for preschool educators. These activities not only improve the methodological competence of teachers but also foster innovation, creativity, and leadership in preschool education, thereby enhancing the overall quality and effectiveness of the national education system.

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HARBIY XIZMATCHILARNI KASBIY FAOLIYATGA MOSLASHUVNING PSIXOLOGIK NAZARIY VA AMALIY JIHATLARI

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Annotasiya: Mazkur maqolada fuqarolarning Qurolli Kuchlar harbiy qismlari va muassasalarida harbiy majburiyatni bajarishdan iborat davlat xizmat turlari keltirilgan. Shu jumladan, harbiy xizmatchining shaxsi, uning kompetentligi, harbiy xizmatchining harbiy xizmatga moslashuv jarayonining mohiyati va moslashuvning ijtimoiylashuv jarayoni bilan aloqasi yoritib berilgan.

Kalit so'zlar: Moslashish, harbiy xizmatchi, harbiy xizmat, jamoa. harbiy xizmatchilarning kompetentligi, kasbiy faoliyatga moslashuv, ijtimoiylashuv jarayoni, burchga sodiqlik, samarali moslashuv, kasbiy ong.

KIRISH

Harbiy xizmatchilarning kasbiy faoliyatga moslashuvi bizning nazarimizda harbiy kiyim kiygan kundan boshlanadi. Chunki, avvalo, harbiy kiyimga, keyin muhitga va faoliyatga moslashadi. Bu uchta omil harbiy xizmatchilar kasbiy ongini shakllantirishga xizmat qiladi. Birinchidan, kasbiy moslashuv, avvalo, har bir harbiy xizmatchining burchiga, vazifasiga bo'lgan munosabatlarida namoyon bo'ladi. Ikkinchidan, harbiy xizmatchilarning kasbiy faoliyati jarayonida qay darajada umumharbiy Nizom talablariga bo'lgan munosabatlarida namoyon bo'ladi.

Jumladan, Harbiy xizmatchilarning kasbiy faoliyatga moslashuvi ularni kompetentligining tarkibiy qismi hisoblanadi. Kompetentlik esa komil insonni shakllanishiga xizmat qiladi. Harbiy xizmatchilarning kompetentligi bevosita huquqiy, psixologik, pedagogik, kibernetik bilimlar bilan chambarchas bog'liq. Kompetensiya so'ziga pedagogika va psixologiyada ko'plab ta'riflar berilgan, biroq kompetensiya biz

o'rganayotgan obyektning predmeti hisoblanmaydi. Har bir harbiy xizmatchining kompetentligi bevosita moslashuv ya'ni kasbiy faoliyatga moslashuv jarayoni bilan bog'liqdir. "Jarayon" deganda ma'lum muddatni o'z ichiga oladigan va shu muddatda harbiy xizmatchining tarbiyalanadigan, shakllanadigan davri tushuniladi. "Jarayon" so'zi arab tilidan olingan bo'lib, oqib borish, sodir bo'lish, ish harakat, voqea-hodisaning birin-ketin borishi, rivoji ma'nosida tushuniladi. Harbiy xizmatchilarning kasbiy faoliyati bir qancha jarayonlardan iborat va bu jarayonlar harbiy xizmatchilarni kasbiy faoliyatga yo'naltiradi va xizmatga moslashtirishga xizmat qiladi.

Kasbiy faoliyatga moslashuv bevosita kasbiy ong, kasbiy madaniyatning rivoji bilan uzviy aloqadorlikda shakllanadi va bu bir tomondan harbiy xizmatchining kasbiy faoliyatiga moslashuvi uning kompetentligi, avvalambor, individual xususiyatiga bog'liq bo'lsa, yuqoridagi fikrimizda aytganimizdek, irodasi bilan bevosita va bilvosita bog'liqlikda namoyon bo'lsa, boshqa tomondan esa har bir harbiy xizmatchini kasbiy faoliyatga moslashuviga davlatning yordamisiz, qo'llab quvvatlashisiz erishib bo'lmaydi. Bugungi kunda ijtimoiy fanlarda, "moslashuv" istihola tushunchalariga ta'riflarni o'nlab topish mumkin. Maqolani yozishda o'z oldimizga mazkur tushunchani har tomonlama chuqur tahlil etish maqsad qilib qo'yilgan, ammo bu tushunchani birgina maqolada yoritib berish imkoni yo'q albatta. Lekin bir nechta tushunchaga to'xtalib o'tamiz, chunki, maqola asosan muammoning nazariy tomonlarining tahliliga qaratilgan.

"Moslashuv" atamasi bevosita kasbiy faoliyatga nisbatan qo'llanilishi ham mumkin, ikkinchi tomondan esa huquqiy jihatdan moslashuv tushunchasi bilan ham bog'liq. Huquqiy jihatdan kasbiy faoliyatga moslashuv huquqiy madaniyatni shakllantirish tushunchasi bilan. bevosita bog'liqdir. Lekin, huquqiy jihatdan kasbiy faoliyatga moslashuv biz o'rganayotgan muammoning bir qismi hisoblanadi va bizni o'rganish obyektimizga taalluqli emas. Bugungi kunda harbiy xizmatchilarning kasbiy faoliyatga moslashuvi barcha ijtimoiy fanlar singari harbiy xizmatchining kasbiy faoliyatga moslashuv muammosini pedagogika nazariyasining bahs mavzusiga aylantirmoqda. "Xodim" atamasi ko'pchilik olimlarimiz ya'ni, V.Alimasov, N.N.Azizxodjayeva, O.M.Asqarova, I.Ismoilov, Z.Zaripov, X.Mamatov, U.Tadjixanov va R.Maxmudovlar tomonidan keng o'rganilgan va o'rganib kelinmoqda. Yuqorida zikr etilgan olimlarning ishlarida tadqiqotlarning ahamiyatini qayd etish barobarida shuni ta'kidlash lozimki, mazkur olimlarning ilmiy ishlarida harbiy xizmatchi va uning kasbiy faoliyatiga moslashuvi chuqur o'rganilmagan, chunki ularning o'rganish obyekti boshqa

muammoga qaratilgan bo'lgan va moslashuvning ayrim jihatlari o'zlarining ilmiy ishlarida yoritishga harakat qilingan. Shu bilan birga kasbiy faoliyatga moslashuv tadqiqot mavzusi sifatida tahlil etilmagan. Hozirgi vaqtda aksariyat yoshlar yangi sharoitga qiyinchiliklarsiz moslashish imkonini beradigan jismoniy, psixologik va ijtimoiy rivojlanishning yuqori mezonlariga mos kelmaydi. Shu munosabat bilan bo'linma ofitseriga me'yorlarga muvofiq shaxsning boshlang'ich sifat va imkoniyatlarini, bu sifatlarni rivojlantirishning yo'llarini hisobga olgan holda moslashish jarayonini amalga oshirishning optimal usullarini qidirish vazifasi yuklanadi. Shuning uchun ushbu mavzuni ahamiyatli deb hisoblash mumkin. Moslashish (Lotincha) bu tananing, shaxsning, uning xarakterlar tizimining 12 alohida ta'sirlar yoki o'zgargan yashash sharoitlariga moslashishi. Qaysi sharoitlarda va qaysi mexanizmlar vositada muhitga moslashish sodir bo'lishiga qarab, har xil moslashishning turlari ajraladi:

- organizmdagi turli tizimlarining fiziologik o'zaro ta'siri: hayotiy ahamiyat ta'siriga mos ravishda a'zolar funksiyalarida moddalar almashinuvida biologik o'zgarish; psixik jarayon darajasidagi vazifalarga, xususiyatlarga, holatlarga, masalan qorong'uda ko'z sezgirligini oshishi kabi sharoitlarga insonning psixologik moslashishi;
- yangi jamoadagi o'zaro munosabatlarga ijtimoiy-psixologik moslashish. Moslashishning bu turlari bir vaqtning o'zida o'zaro aloqada bo'lishi va o'zini namoyon qilishi mumkin. Agar inson bo'lajak faoliyatning ehtimoliy holatlari bilan tanish bo'lsa, to'g'ri yo'nalish uchun zarur bo'lgan bilim va ma'lumotlarga ega bo'lsa yangi vaziyatga moslashish jarayoni tezlashadi.

Muvaffaqiyatli moslashish uchun o'zining hatti-harakatlarini boshqarishni, ichki holatini muhit talablari bilan muvofiqlashtirishni, hayotning yangi vaziyatlariga muvofiq tayyorlikni rivojlantirishni o'rganish kerak. Moslashish muammolarining dolzarbligi, harbiy faoliyat uchun harbiy xizmatchilarni tayyorlash manfaatlarida uning mohiyati, tarkibi, xususiyatlari va unga samarali ta'siri yo'llarini faol va sarmahsul izlanishi shartligiga olib keldi. Ammo shu bilan birga, tabiiy ravishda "Moslashish" atamasiga ko'plab tarif berishga urinishlar paydo bo'lishiga olib keldi. Harbiy xizmatchilarning moslashish jarayonida ularning psixologik xususiyatlari va sifatlari taqdim etilgan yangi faoliyat talablarga muvofiq tiklash sodir bolatiofiqliklar, idealar, e'tiqodlar, yangi istiqbollarga hot qayta tiklash sodir bo'ladi. Motivatsion kompleksni qayta tiklash harbiy xizmatchida maqsadlarining paydo bo'lishiga yoki kuchayishiga

olib keladi. Ularning mahorati, ko'nikmalari va odatlarida sezilarli o'zgarishlardir oshkor bo'ladi. Ulardan harbiy jamoadagi xulq-atvor talablariga javob beradiganlari rivojlanadi, javob bermaydiganlari zaiflashadi va yo'qoladi. Yosh harbiy xizmatchilar bilan butlangan harbiy jamoalar umumiy va farqlovchi xususiyatlariga ega. Har bir yosh harbiy xizmatchining harbiy xizmatni o'tash shartlariga moslashish bo'yicha jiddiy ishlarni amalga oshirmasdan turib, individual tarbiyaviy ishlarni takomillashtirish, axloqiy, jangovar va psixologik tayyorgarlik samaradorligini oshirish, harbiy intizomni mustahkamlashning imkoni bo'lmaydi. Harbiy xizmatdagi eng muhim davr moslashish davri bo'lib shaxs ichki dunyosida qayta tiklanish, uning yashash tarzi va maishiy hayotida harbiy muhitning talablariga moslashish sodir bo'ladi. Ushbu davrning qanchalik darajada muvaffaqiyatli o'tishi, keyingi xizmatni davom etishiga bog'liq bo'ladi. Ushbu davrning muhim jihati, shaxs qanday qilib atrofdagilar bilan munosabatlarni tiklashi, nizoli holatlarda o'zini qanday tutishi, o'zining munosibligini qanday saqlashi, o'zining "Meni", qaysi psixologik himoya mexanizmlaridan foydalanishi hisoblanadi.

Armiyadagi harbiy xizmatchilarning ijtimoiy-psixologik moslashuv jarayoni juda dinamik va uning muvaffaqiyati ko'p jihatdan bir qator ob'ektiv va sub'ektiv sharoitlar, funksional holat, ijtimoiy tajriba, hayotga munosabat va boshqalarga bog'liq. Ijtimoiy-psixologik moslashuvning sabablari yangi o'ziga xos muhitda sodir bo'ladigan va yoshlar fuqarolik hayotida uchramagan ko'plab omillardir:

- harbiy-professional faoliyat qat'iy tartibga solinadi;
- umum harbiy nizomning talablari;
- munosabatlarning yangi shakllari;
- murakkab harbiy texnikaga texnik xizmat ko'rsatish;
- faoliyatning o'zaro bog'langan jamoaviy xususiyati;
- hal qilinadigan vazifalarning umumiyliigi.

Agar harbiy jamoa zaif bo'lsa, jamoaning aksariyat a'zolari xizmat va jamoat vazifalarini yechishda passivdirlar, komandirlar ishning asl mohiyatini bilishmaydi, aks holda harbiy xizmatchida "Moslashishi" ning boshqacha qiyofasini ko'rishingiz mumkin. Zamonaviy armiyada harbiy xizmatga chaqirilgan yoshlar, moslashish jarayonidan kamida ikki marta o'tkazishi kerak:

-ular maxsus o'quv bo'linmalariga o'qishga kirganda;

-ular keyingi xizmatini davom ettirish uchun jangovar bo'linmalarga tayinlanganda. Harbiy xizmatchilarning ijtimoiy-psixologik moslashuv darajasi qanchalik yuqori bo'lsa, harbiy-professional yo'nalish ham shunchalik yuqori bo'ladi.

Qurolli Kuchlar tizimidagi bo'lajak harbiy xizmatchilarda kasbiy moslashuvchanlikni oshirishni ijtimoiy-psixologik jihatdan tadqiq etish o'ta muhim masala hisoblanadi.

Qurolli Kuchlar tizimidagi bo'lajak harbiy xizmatchilarda kasbiy moslashuvchanlikni oshirishni keng ko'lamli tadqiqotlar olib borilsa, moslashuvchanlikka xos xususiyatlar aniqlansa, kasbiy moslashuvchanlik ta'sir etuvchi ijtimoiy-psixologik omillar tadqiq etilsa, u holda harbiy xizmatchilar uchun shart sanalgan ko'plab psixologik sifatlarning aniqlanishi ehtimoldan holi bo'maydi.

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NERV SISTEMASI ANATOMIYASI, TUZILISHI VA VAZIFALARI

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Annotatsiya: Ushbu maqolada nerv sistemasi nima. Nerv sistemasining tuzilishi haqida. Markaziy nerv sistemasidagi psixik jarayonlar qanday kechishi. Nerv sistemasining funksiyalari. Parasimpatik nerv sistemasi nima ekanligi va somatik nerv sistemasi haqida batafsil yoritilgan.

Kalit so'zlar: Nerv sistemasi, markaziy nerv sistemasi, parasimpatik nerv sistemasi, somatik nerv sistemasi, dendrit, akson.

Organizmlarning tarixiy rivojlanish jarayonida Nerv sistemasining tuzilishi murakkablashib, nerv hujayralarining hajmi va turlari osha borgan, neyronlar strukturasi va ayrim nerv hujayralari o‘rtasidagi o‘zaro munosabatlar, shu bilan birga Nerv sistemasining funksiyasi ham shakllangan. Nerv sistemasiga xos ikkinchi to‘qima — neyrogliya paydo bo‘lgan (u tayanch va trofik funksiyalarni bajaradi). Hayvonlar organizmining evolyutsiya jarayonida va organizmlar bilan tashqi muhit o‘rtasidagi murakkab munosabatlarning shakllanishida Nerv sistemasi hal qiluvchi ahamiyatga ega. Nerv sistemasi asosini nerv hujayralari tashkil qiladi. Har bir hujayra o‘zidan chiqqan kalta shoxchalar (dendrit), bitta uzun tola (akson) bilan birga neyron deb ataladi. Nerv sistemasi, asosan, neyronlar to‘plamidan iborat. Nerv sistemasi filogeneza va ontogeneza davrida tashqi qavat — ektodermadan rivojlanadi.

Nerv sistemasi — odam va hayvonlar organizmida barcha a‘zolar faoliyatini bir-biriga bog‘lagan holda hayotiy muhim funksiyalarni bajaradigan hamda organizmni tashqi muhit bilan bog‘laydigan sistema. Hayvonlar organizmining evolyutsiya jarayonida va organizmlar bilan tashqi muhit o‘rtasidagi murakkab munosabatlarning shakllanishida Nerv sistemasi hal qiluvchi ahamiyatga ega.

Nerv sistemasi ning rivojlanishi davrida markaziy nerv sistemasi va periferik nerv sistemasi vujudga keladi. Nerv sistemasi shartli ravishda ikki qismga bo‘linadi.

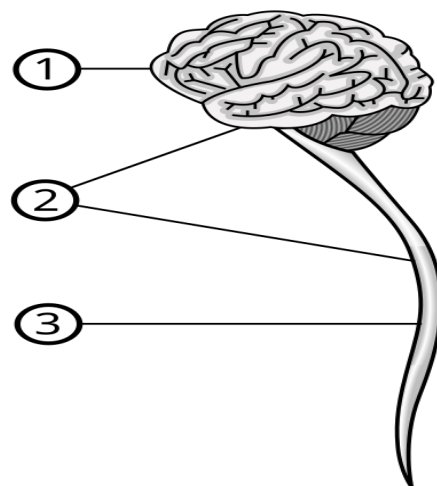
Ulardan biri organizmning odam ixtiyoriga bo'ysinmaydigan a'zolariga borib, ularni nerv bilan ta'minlaydigan vegetativ nerv sistemasidir. Ikkinchi qism odam ixtiyoriga bo'ysinib, skelet muskullariga va harakatda ishtirok etadigan ayrim a'zolarga boradi. Nerv sistemasi qo'zg'alish to'liqlini — impuls larni nerv tolalari orqali tez o'tkazilishini ta'minlaydi. Nerv impulslari bir lahzada ro'y beradi va turli a'zoldan miyaga yoki miyadan a'zolarga boradi. Nerv sistemasi harakat funksiyasini, ovqat hazm qilish, nafas olish va boshqa sistemalar faoliyatini, kon aylanishini va boshqa jarayonlarni boshqaradi. Nerv sistemasi tuzilmalari ta'sirotni sezadi, ta'sirotlar energiyasini nerv qo'zg'alishi energiyasiga aylantiradi, bu energiya nerv impulslari shaklida nerv tolalaridan o'tadi. Nerv sistemasi murakkablashgan sayin va unda maxsus retseptor (sezuvchi) hujayralar ixtisoslashgan sayin Nerv sistemasi funksiyalari tobora turli-tuman bo'lib qolgan. Nerv sistemasi refleks yo'li bilan ishlaydi. Organizmda tashqi va ichki muxit ta'sirotlarini sezadigan retseptorlar bor. Normal sharoitda organizmga tashqi muhit turli-tuman va doimiy ta'sir kursatishi tufayli retseptorlarda impuls lar vujudga keladi, bular afferent nerv tolalari orqali markaziy Nerv sistemasiga o'tadi; o'zgartirilgan impuls lar esa markaziy Nerv sistemasidan efferent nerv tolalari orqali ishchi a'zolar (muskullar, bezlar va hokazo)ga kelib, ularni ishga soladi yoki ishlash tezligini o'zgartiradi. Nerv sistemasining faoliyati qo'zg'alish va tormozlanish jarayonlariga asoslangan. Butun organizm kabi Nerv sistemasida ham moddalar almashinib turadi. Bu biokimyoviy jarayon natijasida energiya hosil bo'ladi. Nerv tolalari ishlaganda energiyani juda kam sarf qiladi, nervlarning amalda charchamay, barqaror ishlashiga sabab shu. Nerv hujayralarining tanalarida energiya nisbatan koproq sarflanadi va moddalar tezroq almashinadi. Shuning uchun oziq moddalar va kislorod kamchiligi miyaning kulrang moddasiga kuchli ta'sir ko'rsatadi. Nerv sistemasining faoliyatida bir neyron dan ikkinchi neyron ga yoki boshqa hujayraga impuls utishida fiziologik faol moddalar — mediatorlar muhim rol o'ynaydi. Nerv sistemasining ishlashida biotoklar (bioelektr potentsiallari) muhim ahamiyat kasb etadi. Ular qo'zg'alish jarayonining harakterli belgisi bo'lib, nerv impulslarining utishida katta ahamiyatga ega. Nerv sistemasi biotoklarini sezgir asbobl ar yordamida qayd qilish Nerv sistemasi fiziologiyasini o'rganishda asosiy usullardan biridir, ba'zan odamdagi Nerv sistemasi kasalliklarini aniqlashda ham bu usul qo'llanadi.

I. P. Pavlov nerv sistemasining tiplari (hayvonlar va odam oliy nerv faoliyatining individual xususiyatlari) haqidagi tushunchani fiziologiyaga kiritgan. Qo'zg'alish va tormozlanish jarayonlarining kuchi muvozanatlanganligi, harakatchanligi kabi 3 ta

asosiy funksional xossani nazarda tutib, Nerv sistemasining odam va hayvonlar uchun umumiy bo'lgan quyidagi tiplari aniqlangan: 1) juda jonsarak tipda qo'zg'alish va tormozlanish jarayonlari kuchli, ammo muvozanatlashmagan (qo'zg'alish tormozlanishdan ustun) bo'ladi; 2) juda serharakat tipda nerv jarayonlari juda kuchli, muvozanatlashgan va yaxshi harakatchan (tez almashinadigan) buladi; 3) juda yuvosh tipda nerv jarayonlari kuchli, muvozanatlashgan, lekin harakatchanligi kamroq (sekin almashinadigan) buladi; 4) nimjon tipda nerv jarayonlari sust, bosh miya po'stlog'idan nerv hujayralarining ish qirbi-liyati past bo'ladi. I.P. Pavlov Nerv sistemasining tiplari bilan odamlarning 4 xil temperamenti (mizoj) o'rtasida o'xshashlik borligini anikdadi. Jonsarak tip xolerik temperamentga, serharakat tip sangvinik temperamentga, yuvosh tip flegmatik temperamentga, nimjon tip melanxolik temperamentga mos keladi.

Markaziy nerv sistemasi - odam va hayvonlar nerv sistemasining asosiy qismi; nerv hujayralari (neyronlar) va ularning o'simtalaridan tarkib topgan. Markaziy nerv sistemasida. umurtqasiz hayvonlarda o'zaro birikkan nerv tugunlari (gangliy) sistemasidan, umurtqali hayvonlar va odamda bosh miya va orka miyadan iborat. Markaziy nerv sistemasida. va periferiy, nerv sistemasi funksional jihatdan bir butun sistema bo'lib, sezuvchi (afferent) va harakatlantiruvchi (efferent) nerv tolalari orqali barcha a'zolar va to'qimalar bilan bog'langan. Markaziy nerv sistemasida. ning eng murakkab va maxsus qismi bosh miya katta yarimsharlardir. Markaziy nerv sistemasida. ning asosiy funksiyasi atrof muhit hamda a'zolar va to'qimalardagi o'zgarishlar to'g'risidagi axborotni qabul qilish, qayta ishlash, o'tkazish va saqlash; organizmning barcha sistemalari faoliyatini boshqarish, ular o'rtasidagi bog'lanishni amalga oshirish orqali organizmning bir butunligini ta'minlashdan iborat. Evolyusiya jarayonida umurtqasiz hayvonlarda 2 xil: tarqoq-tugunli (bo'shliqichlilarda) va ancha murakkab tuzilgan tugunli (halqali chuvalchanglar va bo'g'imoyoqlilarda) Markaziy nerv sistemasida. shakllangan. Umurtqali hayvonlarning embrional rivojlanishida Markaziy nerv sistemasida. dastlab yaxlit nerv nayi ko'rinishida bo'lsa, tuban xordalilar (mas, lansetnik)da nerv nayi ularning butun hayoti davomida saqlanib qoladi. Yuksak xordalilarda embrional rivojlanish davrida nerv nayining oldingi qismi yo'g'onlashib bosh miya bo'limlarini hosil qiladi. Dastlab oldingi, o'rta va rombsimon bo'limlar, keyinroq oldingi miyaning bir qismi — oraliq miya tashkil topadi; rombsimon bo'limdan Varoli ko'prigi, miyacha va uzunchoq miya shakllanadi. Sudralib yuruvchilar, qushlar va sut emizuvchilarda oldingi miyaning po'stloq-osti tuzilmalari (bazal gangliylar, oraliq miya) va bosh miya katta yarimsharlari po'stlog'i rivojlanadi. Sut emizuvchilarda katta yarimsharlar po'stlog'i bosh miyaning eng yirik kismini

tashkil etadi. Bosh miya ham orqa miya singari oraliq va harakatlantiruvchi neyronlardan iborat. Sezuvchi neyronlar tanasi esa Markazii nerv sistemasis. dan tashqarida gangliylarda joylashgan. Filogenez jarayenida oraliq neyronlarning miqdoriy nisbati ortadi. Yuksak primatlarda ular barcha neyronlarning 99,95% ini tashkil etadi. Markazii nerv sistemasis.da neyroglia hujayralari ham bo'ladi.



(1) Miya (2) Markaziy nerv sistemasisi (3) Orqa miya

Markazii nerv sistemasisining funksiyasi reflekslar orqali amalga oshadi. Barcha psixik jarayonlar (o'rganish, eslash, tafakkur, nutq va boshqalar) shartli reflekslar bilan bog'liq. Har qanday refleksning moddiy asosini refleks yoyi tashkil etadi. Muayyan ta'sirlovchiga iqtisoslashgan retseptorlar bo'lishi, nerv impulslarini bir yo'nalishda o'tkazish, neyronlar o'rtasida sinaptik bog'lanish (qarang Sinapslar), ishchi organda funksional javobning vujudga kelishi reflektor yoyi uchun xos bo'lgan xususiyatlar hisoblanadi. Reflektor yoyining markaziy qismi keladigan va chiqadigan impulslarni nazorat qilish sistemasiga ega. Sut emizuvchilarning Markazii nerv sistemasis.da eng sodda reflektor yoyi monoseptik yey hisoblanadi. Odatda umurtqali hayvonlar Markazii nerv sistemasis.dagi reflektor yoylari miya bo'limlaridan ham tashqariga chiqadigan nerv hujayralarining murakkab tutashuvidan iborat. Miya reflektorining o'zaro integratsiyalanishi (muvofiklashuvi) tufayli Markazii nerv sistemasis. bir butun, izchil sistemada namoyon bo'ladi. Integrativ sistemalar taxminan bir xildagi funksional elementlardan iborat bo'ladi. Ularning elementlari son jihatdan cheklangan nerv jarayonlari (postsinaptik potentsiallarni kuzatuvchi va tormozlovchi, javob beruvchi potentsiallar) orqali o'zaro bog'langan. Nisbatan sodda tuzilgan integrativ sistemaga misol qilib orqa miya refleksini ko'rsatish mumkin. Neyronal programmali integrativ sistema ham mavjud. Bu sistema tashqi va ichki afferent signallarga javob tariqasida ketma-ket sodir bo'ladigan va o'zaro qat'iy muvofikdashgan reflekslarni ishga soladi. Bu reflekslar tufayli nafas olish,

harakatlanish, yutinish kabi murakkab jarayonlar amalga oshadi. Miya dastasi integrativ sistemasi oldingi miyaga o'tadigan ax-borot hamda orqa miya motoneyronlariga chiqadigan signallar oqimi orqali boshqarib turiladi. Emotsional reaksiyalar asosini ham Markazii nerv sistemasis.ning bir qancha integrativ sistemalari tashkil etadi. Miya dastasi neyronlarining maxsus guruhi neyromediatorlar (monoaminlar, peptidlar, aminokislotalar va boshqalar) ishlab chiqaradi. Bu neyromediatorlar aksonlari Markazii nerv sistemasis.ning funksional ixtisoslashgan maxsus qismiga boradi. Neyromediatorlar nerv funksiyasini faollashtiruvchi yoki tormozlovchi neyromo-dullashtiruvchi sistemalar qatoriga kiradi. Organizmning tetikligini saqlab, kishi tabiatini va tush ko'rishini boshqarib turuvchi noradrenergik sistema; emotsional reaksiyalar, murakkab harakatlar, tetiklik, huzurhalovatni sezishni boshqaruvchi dofaminergik sistema; termoregulyasiya, sezgi, uyquga ketishni boshqaruvchi seratoninergik sistema ham neyromodullashtiruvchi sistemaga kiradi. Neyromodul va integrativ sistemalarning o'zaro ta'siri tufayli Markazii nerv sistemasis.ning murakkab fiziologik jarayonlarni boshqarish imkoniyati oshadi.

Orqa miya ikki xil: reflektor va o'tkazuvchilik fimksiyasini bajaradi. Orqa miyaning reflektor funksiyasi. Orqa miyaning reflektor funksiyasi reflekslar hosil qilishdan iborat. Refleks - bu tashqi va ichki muhit ta'siriga organizmning javob reaksiyasidir. Refleks markaziy nerv sistemasining asosiy va maxsus funksiyasi hisoblanadi. Odam organizmining barcha faoliyati reflekslar orqali amalga oshadi. Masalan, og'riqni sezish, qo'l va oyoqlarning harakati, nafas olish va chiqarish, ko'zni yumish va ochish kabilar.

Refleks yoyi. Har bir refleksning rejleks yoyi bo'lib, u quyidagi qismJardan iborat: 1) retseptor - to'qima va organlarda joylashgan bo'lib, tashqi va ichki muhit ta'sirini qabul qilib qo'zg'aladi; 2) sezuvchi nerv tolasi - reseptorning qo'zg'alishidan hosil bo'lgan impulsni nerv markaziga yetkazadi; 3) nerv markazi miyada joylashgan sezuvchi, oraliq va harakatlantiruvchi nerv hujayralaridan iborat; 4) harakatlantiruvchi nerv tolasi - nerv markazidagi qo'zg'alishni ishchi organga yetkazadi; 5) ishchi a'zo - muskul, bez, qon tomirlari, ichki organlar va hokazo.

Orqa miya reOekslari. Bosh miyasi olib tashlangan baqani keyingi oyoq panjasiga kislota yoki biron mexanik qitiqlagich ta'sir ettirilganda baqa ta'sirga javoban o'sha oyog'ini tortib oladi. Agar baqaning panjasi qattiqroq qisib olinsa, u nafaqat ta'sir etilgan oyog'ini, balki ikkinchisini ham tortib oladi. Chunki qattiq ta'sir ko'rsatilganda qo'zg'alish ta'sir benlgan to'qimaning nerv markazidan tashqari, uning atrofidagi boshqa markazlarga ham tarqaladi. Odamda orqa miyaning harakatlantiruvchi

refleksini quyidagi tajribada kuzatish mumkin. Buning uchun tekshiriluvchi odam stulda oyoqlarini chalishtirib o'tiradi. Uning yuqorida turgan oyog'ining tizza payiga maxsus rezina bolg'acha bilan sekin urganda, yuqoridagi oyoq silkinib ko'tariladi. Bu tizzaning harakat refleksini ko'rsatadi. Tizza refleksi hosil bo'lishida quyidagi retleks yoyi ishtirok etadi. Tizza payiga bolg'acha bilan urilganda uning muskulida joylashgan retseptor qo'zg'aladi. Retseptorning qo'zg'alishidan hosil bo'lgan impuls sezuvchi nerv tolasi orqali orqa miyaning sezuvchi nerv hujayralariga borib, uni qo'zg'atadi. Uning qo'zg'alishioraliq nerv hujayrasiga o'tib, undan harakatlantiruvchi nerv hujayrasini qo'zg'atadi. Bu hujayradan impuls harakatlantiruvchi nerv tolasi orqali tizza muskulini qisqartirib, oyoqni harakatga keltiradi. Shunday qilib, tizza retleksi quyidagi retleks yoyi bo'yicha hosil bo'ladi: retseptor sezuvchi nerv tolasi - sezuvchi nerv hujayrasi, oraliq nerv hujayrasi, harakatlantiruvchi nerv hujayrasi, harakatlantiruvchi nerv tolasi, muskul. Binobarin, refleks hosil bo'lishi uchun refleks yoyining barcha qismlari butun va sog'lom bo'lishi kerak. Ularning birortasi shikastlansa, refleks hosil bo'lmaydi. Orqa miyaning o'tkazuvchilik funksiyasi. Tananing turli joylaridagi retseptorlardan sezuvchi nerv tolalari orqali orqa miya nerv markazlariga kelgan impuls uning oq moddasida joylashgan o'tkazuvchi nerv yo'llari orqali bosh miyaning nerv markazlariga o'tkaziladi. Bosh miyaning nerv markazlarida hosil bo'lgan qo'zg'alish pastga tushuvchi o'tkazuvchi nerv yo'llari orqali orqa miyaning shunga taalluqli nerv markazlariga keladi va undan ishchi a'zolarga o'tkaziladi. Shunday qilib, bosh miya bilan orqa miyaning o'tkazuvchi yo'llari orqali barcha to'qima va organing sezish hamda harakatlanish funksiyasi boshqariladi.

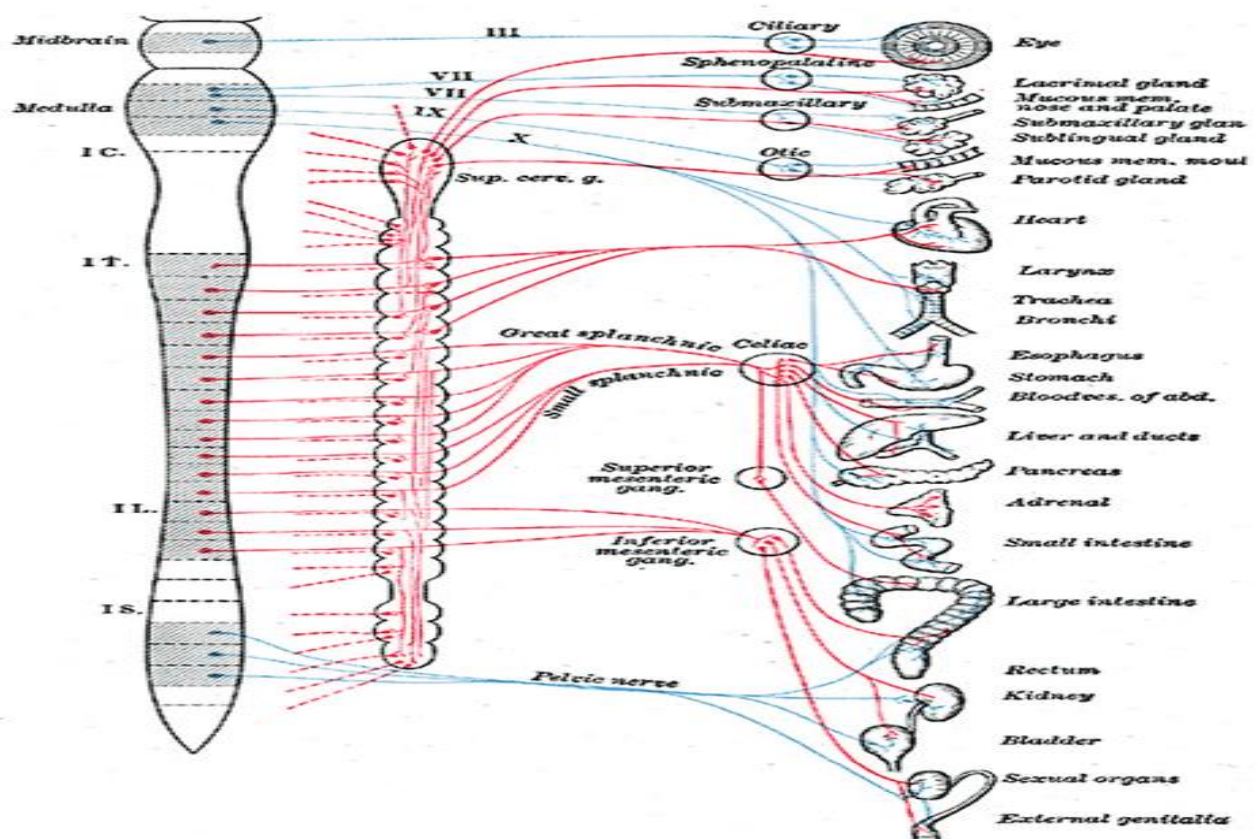
Shuni alohida ta'kidlash kerakki, yuqoriga ko'tariluvchi va pastga tushuvchi, o'tkazuvchi nerv yo'llari bosh miyaning pastki qismlarida kesishadi. Bosh miyaning o'ng yarim sharlardagi nerv markazlaridan kelayotgan nerv tolalari chap tomonga, chap yarim sharniki esa o'ng tomonga o'tadi. Buning natijasida o'ng yarim shar tananing chap tomonidagi to'qima va hujayralar funksiyasini boshqaradi, chap yarim shar esa o'ng tomonidagi to'qima va organlar funksiyasini boshqaradi. Orqa miya turli segmentlarining funksiyasi. Orqa miyaning har qaysi segmentida joylashgan nerv markazlari (nerv hujayralari to'plami) tananing turli sohalaridagi to'qima va organlarning sezuvchanligini hamda harakatini ta'minlaydi.

Orqa miyaning bo'yin segmentida joylashgan nerv markazlari tananing bosh sohasidan to ko'krakning 5- qovurg'asigacha, qo'lning tashqi yuzasi, kaft va barmoqlarning terisi hamda muskullarining sezish va harakatlanish funksiyasini ta'minlaydi;

- orqa miyaning ko'krak segmentida joylashgan nerv markazlari ko'krak qafasining 5-qovurg'a sohasidan boshlab, to qovuqqa qadar va qo'ining ichki yuzasi teri va muskullarini hamda shu sohada joylashgan ichki a'zolarining sezish va harakatlanish funksiyasini ta'minlaydi;
- orqa miyaning bel segmentida joylashgan nerv. markazlari tananing qovuq sohasidan boshlab, to oyoqlarning oldingi yuzasi va oyoq bannoqlarigacha bo'lgan to'qima va organlarning sezish va harakatlanish funksiyasini boshqaradi;
- orqa miyaning qaysi bir segmentida joylashgan nerv hujayralari va ularning nerv tolalari shikastlansa yoki kasallansa, o'sha joydagi nerv markazlaridan ta'minlanadigan to'qima va organlarning sezish va harakatlanish funksiyasi yo'qoladi, shu to'qima yoki muskul falajlanib qoladi. Bosh miyaning ahamiyati haqida tushuncha. Bosh miya tabiat yaratgan ajoyib mo'jizadir. Odamning bosh miyasi uning aql idroki, fikrlash qobiliyati, ongi kabi muhim ruhiy xususiyatlarining fiziologik asosi hisoblanadi. U tashqi va ichki muhit ta'sirini analiz-sintez qilib, ularga javob qaytaradi. Tananing barcha to'qima va a'zolari ish faoliyatini bir-biriga bog'lab boshqaradi, organizm bilan tashqi muhitning aloqasini ta'minlab, uni muhit sharoitiga moslashtiradi. Bosh miyaning tuzilishi va funksiyasi. Bosh miya kalla suyagining ichida joylashgan bo'lib, og'irligi katta odamda 1020-1970 g gacha bo'ladi. Shuni ta'kidlash kerakki, bosh miyaning katta-kichikligi odamning aqlini, ish qobiliyatini belgilamaydi. Odamning aqliy faoliyati bosh miya yarim sharlarining po'stloq qismida joylashgan nerv hujayralarining murakkab fiziologik, biokimyoviy va biofizik xususiyatlariga bog'liq. Shuningdek, odam aqliy faoliyatining rivojlanishi uning yoshlikdan tarbiyasi, bilim olishi, mashq qilishiga bog'liq. Bosh miya ikki qismdan iborat: bosh miyaning stvol (ustun) qismi va bosh miya yarim sharlari. Bosh miyaning stvol qismiga uzunchoq miya, Varoliev ko'prigi (miya ko'prigi), o'rta miya, oraliq miya hamda miyacha kiradi. Uzunchoq miya bosh miyaning eng pastki qismi bo'lib, uning quyi qismi orqa miyaga, yuqori qismi esa miya ko'prigiga tutashgan. Uning uzunligi 3-3,5 sm, massasi o'rtacha 7 g bo'ladi. Uzunchoq miyaning tashqi qismi oq rangda bo'lib, unda nerv tolalari joylashgan, ichki qismi kulrang moddadan iborat bo'lib, unda nerv hujayralari bo'ladi. Uzunchoq miya reflektor va o'tkazuvchanlik funksiyalarini bajaradi. Reflektorlik funksiyasi shundan iboratki, unda nafas olish, yurak ishini boshqarish markazlari joylashgan. Binobarin, uzunchoq miyaning shikastlanishi nafas olishning va yurak ishining to'xtab qolishiga sabab bo'ladi. Bundan tashqari, uzunchoq miyadagi nerv markazlarida ko'zni ochib-yumish, ko'z yoshi, aksa urish, yo'talish, oshqozon-ichakda shira ajralishi kabi funksiyalarni ta'minlaydigan reflekslarning markazlari joylashgan.

Parasimpatik nerv sistemasi — vegetativ nerv sistemasining bir qismi. Parasimpatik nerv sistemasi. O‘zi innervatsiya qiladigan a‘zolariga xilma-xil, ko‘pincha, simpatik nerv sistemasi ta‘siriga qarama-qarshi ta‘sir ko‘rsatadi. Parasimpatik nerv sistemasi simpatik nerv sistemasi bilan birga barcha ichki organlar va bezlar faoliyatini boshqarishda qatnashadi.

Vegetativ nerv sistemasi: Simpatik nerv sistemasi (qizil) va Parasimpatik nerv sistemasi (ko‘k).



Somatik nerv sistemasi - odam va hayvonlar nerv sistemasining bir qismi. Tana muskullarini, teri va bo‘g‘imlarni innervatsiyalakdi; organizmning sensor va motor funksiyalarini ta‘minlaydi. Umurtqali qayvonlarda skelet ko‘ndalang targ‘il muskullari Somatik nerv sistemasi s. x, isoblanadi. Ularni orqa miya old shoxlarining motoneyronlari va bosh miya ustuni qismining ba‘zi motor yadrolari innervatsiya qiladi. Bu motoneyronlar harakatining uyg‘unligi to‘g‘ridanto‘g‘ri yoxud muskul, paylardan axborot oladigan neyronlar, shuningdek, bosh miyaning turli qismlaridagi markazlar va boshqa sensor yoki sezuvchi motoneyronlardan keluvchi

internyoyronlarning sinaptik ta'siri vositasida yuzaga keladi. Nerv sistemasining somatik va visseral, ya'ni ichki nerv sistemasiga ajratilishi (k., Vegetativ nerv sistemasi) shartlidir.

Vegetativ nerv sistemasi (lotincha: vegetatio — o'sish, rivojlanish, qo'zg'alish) — odam va umurtqali hayvonlar nerv sistemasining bir qismi; Vegetativ nerv sistemasi ning tolalari barcha ichki a'zolarining silliq muskullariga tarqalib, ular faoliyatini kishi ixtiyorisiz (avtonom holda) boshqarib turadi. Ammo Vegetativ nerv sistemasi animal (skelet muskullarigacha tarqaluvchi) nervlar singari bosh miya katta yarim sharlari po'stlog'i boshqaruvida faoliyat ko'rsatadi. Bu terminni fanga birinchi marta fransuz vrachi M. Bisha kiritgan (1801) va uning somatik nerv sistemasi faoliyatidan farqini ilmiy jihatdan asoslab bergan. Ingliz fiziologi J. Lengli (1903) V.n.s.ni "avtonom nerv sistemasi" deb atadi, chunki Vegetativ nerv sistemasi ning faoliyati ong bilan boshqarilmaydi, shu sababli "avtonom" yoki ixtiyorsiz nerv sistemasi deb ham yuritiladi. V.n.s. moddalar almashinuvi jarayonida qatnashadigan barcha a'zolarining (yurak-qon tomir, nafas, hazm qilish, ajratish, ko'payish) to'qima va muskullar trofikasini (trophe — ovqat) bevosita yoki gumoral (suyuqlik muhit vositasida) yo'l bilan idora etadi. V.n.s. joylanishi va faoliyatiga ko'ra animal nerv sistemasidan birmuncha farq qiladi. Animal nerv sistemasi faqat ko'ndalang-targ'il (skelet) muskullarni idora qilsa, V.n.s. hujayralar, to'qimalar va silliq muskullarni nerv bilan ta'minlaydi. Animal nervlar miya stvoli (ustuni) va orqa miyaning barcha segmentlaridan bir tekisda chiqadi, vegetativ nervlar esa markaziy nerv sistemasining ma'lum qismlaridan (o'rta va uzunchoq miyadan, orqa miyaning barcha ko'krak va uchta bel segmentlarida o'ziga tegishli umurtqalar oraliq'idan, shuningdek dumg'aza sohasidan, ikkinchi — to'rtinchi dumg'aza umurtqalari oraliq'idan) tarqaladi. Animal nervlar orqa miyadan chiqib uzilmasdan ishchi a'zolarga boradi. Vegetativ nervlar miya sohasidan chiqqandan so'ng yo'l-yo'lakay vegetativ tugunlarda to'xtab, keyin ishchi a'zolarga tarqaladi. Bundan tashqari, tugundan oldingi tolalarning har biri tugundan keyingi bir qancha tolalarga o'z ta'sirini o'tkazadi. Animal nervlar miyelin (yog') pardaga o'ralgan va yo'g'onroq, vegetativ nervlar esa miyelinsiz va ingichka bo'ladi. Vegetativ nervlar asosan animal nervlar tarkibida, qon tomirlar devorida chigallar hosil qilib tarqaladi. Vegetativ nervlarning har biri ham sezuvchi, ham harakatlanuvchi tolalar vazifasini bajaradi. Ularda impuls (ta'sir)lar sekundiga 10 m tezlikka yetadi. Somatik nervlar tarkibidagi tolalar (sezuvchi va harakatlanuvchi) esa alohida, miyelin pardali bo'lgani uchun ularda impuls sekundiga 100 m tezlikka yetadi. V.n.s. faoliyatiga ko'ra simpatik va parasimpatik nerv sistemasiga ajratiladi.

Simpatik nerv sistemasi adrenalining o'xshaydigan simpatii, parasimpatik nerv sistemasi esa atsetilxolin vositasi ta'sirida qo'zg'aladi. Bu moddalar qonga va limfa suyukligiga shilib, ular orqali nervlar qo'zg'aladi. Markaziy nerv sistemasi tashqi va ichki muhit ta'sirlariga V.n.s. orqali javob beradi va organizmni doim o'zgarib turadigan muhitga moslashtiradi. Odatda simpatik nervlar funksiyasi jihatidan parasimpatik nervlarga qarama-qarshi ta'sir ko'rsatadi. Simpatik nervlar ko'z qorachig'ini kengaytiradi, so'lak va b. ajralishini kamaytiradi, yurak qisqarishini kuchaytiradi, me'da va ichak harakati (peristaltika)ni susaytirib, ularning shira chiqarish faoliyatini pasaytiradi, o'pka, bronxlarni kengaytiradi. Parasimpatik nervlar esa aksincha ko'z qorachig'ini siqib toraytiradi, sulak bezlari ishini kuchaytiradi, yurak faoliyatini pasaytiradi, ichak harakatini tezlashtiradi, o'pka, bronxlarni toraytiradi. V.n.s. somatik nerv sistemasi bilan bir butun hamjihat bo'lib ishlaydi, uni markaziy nerv sistemasining oliy bo'limlari, asosan bosh miya katta yarim sharlari po'stlog'i nazorat qilib turadi. Mas., organizmga sovuq ta'sir qilganda simpatik nervlar qo'zg'alib, qon tomirlar torayadi. Gipofiz, buyrak usti bezi, qalqonsimon bez faoliyati kuchayadi, natijada bir talay adrenalin ajralib, organizmda issiqlik saqlanishini ta'minlaydi. Aksincha, organizmda issiqlik ko'payishi tufayli parasimpatik nervlar qo'zg'aladi. Vegetativ nerv sistemasi ning faoliyati turli kasalliklar davrida, obhavoning o'zgarishi, tashqi va ichki ta'sirlar orqali o'zgaradi.

Xulosa o'rnida Eric Kandelning ishlari nerv tizimi va xotira o'rganishida inqilobiy ahamiyatga egaligini ko'rsatib o'tishim mumkin. Uning tadqiqotlari molekulyar nevrologiya va xotira shakllanishining fiziologik mexanizmlarini tushunishda katta yutuqlarga olib keldi. Mana, Eric Kandel haqida qisqacha ma'lumot va uning ishlari: Eric Kandel 2000-yilda Nobel mukofoti bilan taqdirlandi. Uning kashfiyotlari asosan xotira shakllanishi va o'rganish jarayonini molekulyar darajada tushuntirishga qaratilgan. Uning eng mashhur tadqiqoti Aplysia (yumaloq orqa suyakli molyuskalar) modeli yordamida o'tkazilgan. Kandel Aplysia molluskasining nerv tizimini o'rganib, uning o'rganish va xotira shakllanishidagi mexanizmlarini tushunishga muvaffaq bo'ldi. Aplysia, katta va oson kuzatiladigan nerv hujayralari tufayli, o'rganish va xotira shakllanishi jarayonlarini o'rganishda ideal model bo'ldi. Kandelning eng muhim kashfiyoti shundaki, xotira va o'rganish sinapslarda, ya'ni nerv hujayralari o'rtasidagi aloqa nuqtalarida amalga oshadi. U, sinaptik plastisitetni (ya'ni sinapslarning o'zgarish qobiliyatini) va uzun muddatli potentiatsiya (LTP) kabi jarayonlarni o'rgandi. Bu jarayonlar nerv tizimida xotira saqlanishi va o'rganishning asosiy mexanizmlari sifatida qoraladi. Kandel o'z ishlarida sinapslarning

kuchayishi va zaiflashishi molekulyar darajada qanday ro'y berishini tushuntirdi. U cAMP (adenozin monofosfat tsiklik) va PKA (proteinkinaza A) kabi molekulalarning roli haqida ko'plab ma'lumotlarni kashf etdi. Bu molekulalar xotira va o'rganishning molekulyar asoslarini tashkil etadi.

Eric Kandelning Ma'lumotlari:

1. "The Age of Insight" (2012) – Bu kitobda u xotira, his-tuyg'ular va san'atga oid ilmiy yondoshuvlarni bayon qiladi.
2. "In Search of Memory: The Emergence of a New Science of Mind" (2006) – Bu uning xotira va o'rganish jarayonlaridagi ilmiy tadqiqotlarini o'z ichiga olgan kitobi bo'lib, unda o'zining ilmiy yutuqlarini va kashfiyotlarini yoritadi.

Kandelning Asosiy Yutuqlari. Xotira shakllanishi va uzluksiz o'rganish mexanizmlari haqida yangi tushunchalar yaratdi.

Nerv tizimidagi sinapslarning uzluksiz o'zgarishi (plastisitet) va uzun muddatli potentiatsiya (LTP) kabi jarayonlarni kashf etdi.

Molekulyar darajada o'rganish va xotira shakllanishi qanday ro'y berishini ko'rsatadi. Kandelning ishlari Nobel mukofotiga sazovor bo'lganidan so'ng, ilmiy dunyoda keng tarqaldi.

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PROFESSIONAL LIABILITY INSURANCE IN THE MEDICAL BUSINESS: BALANCING THE INTERESTS OF PATIENTS AND DOCTORS

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ANNOTATION

This thesis explores professional liability insurance in the medical business as a key mechanism for ensuring a balance between the interests of patients and doctors. It examines the legal framework of Uzbekistan, including the 2019–2025 Healthcare Development Concept and the draft Law “On Medical Practice and Mandatory Professional Liability Insurance for Medical Workers.” Based on the analysis of regulatory acts and expert opinions of the National Chamber of Innovative Healthcare, the main problems and directions of reform are identified. A comparative legal study of international experience (USA, Europe, Scandinavia, New Zealand, and Kazakhstan) demonstrates that an effective insurance model should combine guaranteed compensation for patients with the protection of doctors from excessive risks and unfounded claims. The study concludes that Uzbekistan’s legislation requires improvement, taking into account international models, the development of a transparent compensation mechanism, and the possible creation of a state guarantee fund. It is emphasized that building an optimal insurance model is a dynamic process requiring continuous monitoring and constructive interaction between the state, the medical community, insurers, and patients.

Keywords: professional liability insurance; medical business; patients’ rights; legal status of doctors; Uzbekistan; international experience; balance of interests; medical law.

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**СТРАХОВАНИЕ ПРОФЕССИОНАЛЬНОЙ ОТВЕТСТВЕННОСТИ В
МЕДИЦИНСКОМ БИЗНЕСЕ: БАЛАНС ИНТЕРЕСОВ ПАЦИЕНТОВ И ВРАЧЕЙ****Розметова Асаль Анварзода**

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Тезис посвящён исследованию страхования профессиональной ответственности в медицинском бизнесе как ключевого механизма обеспечения баланса интересов пациентов и врачей. Рассматриваются правовые основы Узбекистана, включая Концепцию развития здравоохранения 2019–2025 гг. и проект закона «О медицинской деятельности и обязательном страховании профессиональной ответственности медицинских работников». На основе анализа нормативных актов и экспертных заключений Национальной палаты инновационного здравоохранения определены основные проблемы и направления реформ. Проведён сравнительно-правовой анализ зарубежного опыта (США, Европы, Скандинавии, Новой Зеландии и Казахстана), показавший, что эффективная модель страхования должна сочетать гарантированное возмещение вреда пациентам с защитой врачей от чрезмерных рисков и необоснованных исков. Сделан вывод о необходимости совершенствования законодательства Узбекистана с учётом международных моделей, разработки прозрачного механизма компенсаций и возможного создания государственного гарантийного фонда. Подчёркивается, что формирование оптимальной модели страхования требует постоянного мониторинга и конструктивного взаимодействия между государством, медицинским сообществом, страховщиками и пациентами.

Ключевые слова: страхование профессиональной ответственности; медицинский бизнес; права пациентов; правовой статус врачей; Узбекистан; международный опыт; баланс интересов; медицинское право.

1. INTRODUCTION

Professional liability insurance for medical practitioners is increasingly recognized as a cornerstone of modern healthcare systems, providing a legal and financial mechanism that balances the rights of patients with the interests of physicians. For patients, such insurance serves as a safeguard, ensuring access to timely and fair compensation in cases of medical errors or malpractice, thereby reinforcing trust in healthcare services. For physicians, it functions as a protective shield against disproportionate financial risks and reputational harm, allowing them to practice medicine with greater confidence and professional security.

Globally, two main approaches have emerged in regulating professional medical liability: the fault-based tort system, characteristic of the United States, which relies heavily on litigation and judicial assessment of negligence, and the no-fault compensation system, exemplified by Sweden and other Scandinavian countries, which emphasizes social solidarity and efficient compensation without the

need to prove fault [1]. Many European jurisdictions have sought to combine elements of both, recognizing that well-structured liability insurance systems can reduce litigation rates, improve the quality of medical services, and enhance patient satisfaction [2].

The design of such insurance systems, however, varies significantly across jurisdictions, reflecting differences in legal traditions, institutional frameworks, and healthcare priorities. While some states emphasize mandatory insurance schemes integrated into healthcare financing, others rely on voluntary mechanisms or hybrid approaches. What unites these models is their dual role: compensating patients and preserving the stability of medical practice.

In Uzbekistan, the debate over professional liability insurance has gained momentum in the context of ongoing healthcare reforms and the implementation of the Healthcare Development Concept for 2019–2025. The draft Law “On Medical Practice and Mandatory Professional Liability Insurance for Medical Workers” has highlighted the government’s commitment to introducing systemic changes aimed at improving both patient protection and the working conditions of healthcare professionals. However, questions remain regarding the scope of coverage, financing mechanisms, and the balance between state involvement and private insurance markets.

This thesis aims to explore the development of legal and institutional mechanisms for professional liability insurance in Uzbekistan, situating it within a broader comparative context. By analyzing both domestic initiatives and international best practices, it seeks to identify possible pathways for establishing a fair, transparent, and sustainable system that ensures compensation for patients while protecting physicians from excessive risks. The search for such a balanced model represents not only a legal and economic challenge but also an essential step toward strengthening the resilience and trustworthiness of the national healthcare system.

2. METHODS

The study employs a review-analytical and comparative legal methodology. Uzbek legislation relating to healthcare and insurance was analyzed, in particular the Healthcare Development Concept 2019–2025 and the draft law on compulsory insurance of medical professional liability prepared on its basis [3]. Expert opinions from the National Chamber of Innovative Healthcare of Uzbekistan on the draft law were also taken into account [4]. Comparative analysis focused on international models, with emphasis on Kazakhstan’s newly implemented liability insurance scheme for medical workers [5], including official statements from the Ministry of Health and statistical results from its first year [6]. Broader global practices—such as malpractice insurance in the US and no-fault systems in Scandinavia and New Zealand—were also reviewed. This interdisciplinary approach (legal analysis + comparative study) enables evaluation of both theoretical principles and practical outcomes of liability insurance, as well as the extent to which the balance between patient and physician interests is realized.

3. RESULTS

Until recently, Uzbekistan lacked a specific law mandating professional liability insurance for physicians. Cases of harm to patients were generally resolved under civil or criminal law. Individual licensing of doctors has not yet been introduced, which complicates the establishment of insurance for individual practitioners. In practice, liability claims are directed against the medical organization employing the doctor [4]. Presidential Decree № UP-5590 (2018) laid the foundation for reforms, calling for the adoption of a law “On Medical Activities and Compulsory Professional Liability

Insurance for Medical Workers” [3]. A draft was prepared in 2019 with the stated aim of guaranteeing compensation to harmed patients [4]. However, expert analysis revealed shortcomings. First, the draft was set to take effect immediately despite the absence of a licensing system for doctors [4]. Second, compensation was capped within the insured amount, without ensuring full restitution [4]. If damages exceeded the limit, the remainder fell on the doctor or clinic. Third, moral damages and lost income were excluded, although these constitute up to 80% of real claims [4]. Finally, the draft introduced a regress clause: insurers could reclaim paid compensation from doctors found guilty in court, which undermined the very idea of insurance. The National Chamber concluded the draft favored insurers at the expense of medical professionals. As of 2025, the law has not been enacted, but reforms continue. Meanwhile, Uzbekistan has introduced related measures to protect doctors, such as administrative liability for obstructing lawful medical activity [7].

Globally, models vary. In many European and Asian countries, compulsory insurance through private insurers operates under state regulation. For example, Kazakhstan introduced compulsory professional liability insurance in 2024 via an insurance pool [5]. Employers pay annual premiums for each doctor, and compensation is drawn from pooled funds. The system emphasizes multi-level dispute resolution (internal clinic committees, independent expert review, health authorities) to avoid court litigation [5]. Importantly, physicians no longer pay damages personally; liability shifts to insurers. However, the first-year results were disappointing. Out of 2834 patient complaints, only 9 led to insurance payouts totaling ~59 million tenge, while premiums exceeded 3 billion tenge [6]. Moreover, criminal cases against doctors did not decrease significantly, with 107 new prosecutions in just six months of 2025. Experts argue the law was rushed and failed to deliver systemic improvements. Still, Kazakhstan is refining its approach, including public awareness campaigns and stricter protections for physicians [6].

Elsewhere, models diverge. The US employs a fault-based malpractice system with high compensation but also high costs and “defensive medicine.” Scandinavia and New Zealand, by contrast, operate no-fault schemes, compensating patients via public funds without litigating physician guilt [1]. Many EU countries adopt hybrid models requiring mandatory liability insurance as a condition for medical practice, with minimum coverage limits. In Russia, liability insurance remains voluntary but is gaining traction, particularly in the private sector [2]. Across all systems, the dual objective is clear: ensure fair patient compensation while preventing doctors from being financially ruined by claims.

DISCUSSION

The results of the analysis demonstrate that the introduction of professional liability insurance in healthcare is a complex but necessary measure that requires consideration of numerous factors to balance the interests of patients and physicians. First, the legal foundation must be solid: in Uzbekistan, before compulsory physician insurance can be introduced, the reform of individual licensing of medical practice must be completed [4]. Only with licensed subjects (physicians) does insuring their liability gain legal meaning [4]. At the same time, related norms (for example, the Civil Code) should be amended, or the new law should clearly stipulate that when damages exceed the insured amount, the excess should not automatically fall upon the physician or clinic. Otherwise, insurance will fail to protect medical workers, while patients may still receive insufficient compensation. Uzbek legislators must consider expert criticism: insurance coverage should include

both direct and moral damages suffered by the patient, otherwise trust in the system will remain low [4]. It may be advisable to set higher liability limits or establish a state reserve fund for extraordinary cases beyond the insured ceiling, ensuring victims are never left without full support.

Second, the balance of interests directly depends on the distribution of financial burdens and risks. Kazakhstan's experience shows that shifting premium payments to employers (clinics) and pooling risks through an insurance pool is a step in the right direction, freeing individual doctors from direct payments [5]. However, if insurers simultaneously retain the right of recourse claims against doctors (as in the initial Uzbek draft law) [4], physicians remain under financial threat even with an insurance policy. This contradicts the very essence of liability insurance. For genuine protection of doctors, the right of regress must be legally limited—permitted only in cases of intentional harm or gross negligence, not ordinary error. Such a guarantee would reduce fear among medical personnel that any insurance case could turn into a personal debt to the insurance company. In Uzbekistan, where doctors often fear criminal prosecution and aggressive claims, such legal safeguards would reduce tension and become part of the “social package” for medical workers.

Third, patient interests require a transparent and accessible mechanism of compensation. Here, institutional measures are crucial: creating an independent expert commission or medical ombudsman to handle complaints of harm. A pre-trial settlement procedure should be provided, in which the commission establishes the fact of medical error (or accident) and the recommended compensation amount. This would speed up compensation and reduce prolonged court disputes. European practice shows that active involvement of insurers in assessing and resolving cases reduces conflict if patients feel they have a real chance for fair compensation without lengthy litigation. Moreover, insurers, motivated to minimize payouts, will promote prevention: training doctors, implementing safety protocols—benefiting both patients (fewer incidents) and doctors (fewer claims). Thus, liability insurance should be integrated into the broader healthcare quality management system.

Fourth, international lessons show that without broad awareness and trust, the system will not function. Even the most well-drafted law is ineffective if neither patients nor healthcare professionals understand it. For example, in the first months after liability insurance was introduced in Kazakhstan, many patients were unaware of their right to seek compensation from clinics [6]. Therefore, legislative changes must be accompanied by public awareness campaigns: informing citizens about their rights and procedures for obtaining compensation, and educating medical staff about their rights and obligations under insurance. Medical associations and the National Chamber can play a central role in disseminating this information and protecting physicians' interests during implementation.

Finally, the search for an optimal model may require combining mechanisms. Uzbekistan could consider phased introduction: at the first stage, compulsory liability insurance for private clinics and independent practitioners, where disputes are more likely, as a pilot program. Later, it could be expanded across the entire healthcare system. Another possibility is establishing a state liability guarantee fund (a social model), as previously proposed in the region [8]. Such a fund, financed through insurance contributions or the state budget, could cover cases where insurers refuse to pay due to formalities or when insured limits are exceeded. This “two-layer” mechanism would enhance patient protection. At the same time, state participation would moderate commercial insurer interests, preventing situations where collected premiums vastly exceed payouts. Ultimately, experts

emphasize: laws must be carefully tuned so both sides feel protected and disputes are resolved within the legal framework, not through confrontation [6].

To conclude the discussion, it must be stressed that the balance of interests is not static but a dynamic process. Constant monitoring of practice, collecting data on insurance cases, litigation, and financial outcomes is necessary. If it becomes clear that the system is “misaligned”—for example, generating excessive profits for insurers with minimal patient benefit or failing to ease court burdens—timely adjustments to legislation and procedures will be needed [6]. Constructive dialogue among patients, physicians, insurers, and the state is the key to ensuring professional liability insurance becomes a true bridge balancing interests rather than a source of conflict [9].

CONCLUSION

The development of a legal mechanism for professional liability insurance in the medical business is a complex but essential reform for Uzbekistan. International and regional experience shows that well-designed insurance can act as an effective mediator between patient and physician: the harmed patient receives guaranteed compensation, and the doctor is shielded from the destructive consequences of litigation [10]. Yet this balance can only be achieved through careful refinement of legislation and infrastructure. In Uzbekistan [11], initial steps have been taken: the need for insurance has been acknowledged, and a draft law prepared and subjected to expert review [3]. The review revealed key areas for improvement: aligning provisions with other laws, resolving contradictions (such as licensing), and ensuring fair risk distribution without excessive burdens on doctors [4]. At the same time, the best features of foreign models and neighboring countries’ mistakes should be considered. Crucially, in the final system, patients must be confident of receiving full compensation for justified harm, doctors must be protected from disproportionate punishment for unintentional errors, and insurers must serve as financial guarantors rather than arbiters of doctors’ fate. In other words, a legal framework must be created in which both patient and physician feel secure, knowing their rights are safeguarded. The legislator’s art lies in finding the golden mean: a mechanism that promotes quality and accountability in medicine without generating fear or mistrust. Standing on the path of introducing compulsory health insurance more broadly, Uzbekistan has the opportunity to synchronize this reform with liability insurance—building a comprehensive system that protects both citizens’ health and medical workers’ professional standing. Ongoing legislative improvement, grounded in monitoring and dialogue with stakeholders, will allow the achievement of a truly sustainable balance of interests, where both physicians and patients are equal beneficiaries of insurance protection.

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METHODOLOGY FOR ORGANIZING INDEPENDENT LEARNING ACTIVITIES IN THE ACADEMIC LYCEUMS OF THE MINISTRY OF INTERNAL AFFAIRS

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Annotation. This article addresses the issues of effectively organizing independent learning activities of students in the academic lyceums under the Ministry of Internal Affairs. In particular, it presents proposals and recommendations for organizing independent learning activities through a web-based platform.

Keywords: independent learning activity, academic lyceums of the Ministry of Internal Affairs, students, web platform, organization.

Today, in the educational process, fostering students' ability to acquire knowledge independently, engage in self-directed learning, and develop personal growth skills is regarded as an essential task. In particular, in the academic lyceums under the Ministry of Internal Affairs, the proper organization of independent learning activities plays a crucial role in preparing the younger generation who will work in law enforcement agencies in the future. This is because such students should not only master theoretical knowledge but also acquire the ability to make independent decisions in practical situations, demonstrate initiative, and assume responsibility.

Traditional classroom processes do not sufficiently foster students' skills of independent thinking and inquiry. Therefore, in organizing independent learning, it is crucial to make use of modern information and communication technologies, particularly web-based platforms. An educational process organized through a web platform enables students to independently plan their time, conduct self-directed inquiry, assess their knowledge, and improve their competencies.

In the education system of Uzbekistan, the widespread introduction of a digital learning environment and the development of opportunities for independent learning are considered one of the priority directions of state policy. In particular, organizing the process of independent knowledge acquisition in a professionally oriented manner in the academic lyceums of the Ministry of Internal Affairs ensures the effective performance of students in their future careers. The use of web-based platforms to enhance the effectiveness of independent learning, on the one hand, strengthens the transparency and monitoring of the educational process, and on the other hand, fosters in students a culture of using information technologies [1].

From this perspective, the scientific and methodological study of the issues related to organizing independent learning activities on the basis of web platforms, the determination of their pedagogical foundations, and the development of mechanisms for their practical implementation represent urgent scientific and pedagogical tasks today [2].

To conduct research on this issue, we first came to the conclusion that it is necessary to analyze the concepts of independent education, independent learning activity, and web platform, as well as the views expressed by researchers regarding these concepts.

In this regard, as Y.R.Azzamov states, “independent learning is not only a form of education but also a culture of continuous learning, inquiry, and self-development throughout life. Its proper organization requires the joint activity of teachers and learners, a clearly planned methodology, and a fair assessment system” [3]. According to Ye.V.Minina, “an individual’s independent learning is a purposeful and systematic cognitive activity necessary to solve problems arising at different stages of life activities, not only to improve the level of education but also to satisfy personal needs for acquiring second and third specializations” [4]. A. Paranthaman notes that “independent learning activity is a type of activity aimed at forming, deepening, and consolidating the learner’s knowledge and skills, which includes self-management, self-monitoring, and self-assessment, and is carried out without external guidance or with minimal assistance” [5].

According to Z.Lein, “independent learning activity is a form of educational activity that involves the learner independently planning, performing educational tasks, analyzing results, and generalizing, which requires activity, independence, and initiative in the process of knowledge acquisition” [6].

Based on the analysis of the scientific and methodological works of the above-mentioned researchers and scholars, we have developed the following definition of the concept of independent learning activity of an academic lyceum student.

The independent learning activity of an academic lyceum student is a form of educational activity consciously carried out through self-management, planning, inquiry, and evaluation, aimed at mastering, analyzing, and creatively applying theoretical and practical knowledge, based on the learner’s individual needs, interests, and intellectual potential oriented towards professional development.

In today’s context, as the education system is stepping into the stage of digital transformation, the effective organization of independent learning activities of academic lyceum students cannot be imagined without the use of digital technologies [1]. Digital tools provide learners with opportunities to work independently on the acquired knowledge, quickly access necessary resources, exercise self-monitoring, and analyze results. In our view, through digital technologies, particularly web-based platforms, students can design their independent tasks, collaborate remotely, and maintain their educational achievements in the form of a portfolio. This serves as an essential factor in developing their metacognitive skills.

In this regard, according to H.O.Jo‘rayev and F.G‘.Tohirova, “web platforms offer features and functions that align with various teaching methods and goals, making them indispensable in modern educational strategies. From interactive modules and simulations to collaborative projects and real-time feedback mechanisms, these platforms create dynamic learning environments that simulate authentic professional scenarios” [7].

Based on the provided definitions and the analysis of scholarly research, it can be stated that the use of web-based platforms plays a crucial role in organizing the independent learning activities of students in the academic lyceums of the Ministry of Internal Affairs.

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CLINICAL AND IMMUNOLOGICAL CHARACTERISTICS OF PATIENTS WITH VARIOUS OUTCOMES OF LIPOFILLING

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Abstract. The most pronounced immunological disturbances were observed with lipofilling of the mammary glands, which corresponds to the high clinical complication rate in this area. The data obtained confirm the presence of an immunological predisposition to an unfavorable outcome of the procedure and can serve as a basis for developing a risk prediction system.

Keywords: lipofilling, immunity, complications

Relevance. A review of literature on the issue of fat tissue engraftment after lipofilling revealed that investigating the causes and mechanisms of complicated outcomes in this procedure requires a comprehensive analysis of not only clinical data but also the immunological and morphological context within which the adverse outcome of the procedure occurs (1,3,5). Furthermore, given that lipofilling surgery involves the transfer and integration of autologous tissue, the outcome is determined not only by technical parameters but also by the body's reactive capabilities, primarily the immune system (2,4).

Failure to engraft fat with the formation of necrosis, cysts, indurations, and other complications, as clinical observations show, is not always explained by anatomical or surgical factors but may be related to the individual immunological characteristics of the patient (3,4).

The aim of the study was to conduct a comprehensive investigation of systemic and local changes in the immune profile in patients undergoing lipofilling with varying clinical outcomes.

Material and Methods. This study assessed the incidence of lipofilling complications in a control group of 93 patients who did not undergo immunological prognostication or prevention. Analysis of the distribution of adverse outcomes by anatomical sites of intervention revealed a clear correlation between the incidence of complications and the location of fat graft injection.

Results and discussion. The lowest complication rate was recorded for facial lipofilling, with 4 cases out of 24 (16.7%). A significantly higher complication rate was observed for breast lipofilling, occurring in 17 out of 37 cases (45.9%). Clinically, these patients experienced the formation of dense masses, swelling, and asymmetry. In some women, cysts or lipogranulomas were verified by ultrasound, and in some cases, aspiration biopsy was performed. Comparable complication rates were also observed for gluteal lipofilling. Of the 21 procedures performed on the gluteal region, complications were noted in 9 cases (42.9%). In this segment, the main complaints were the formation of dense masses, tenderness upon palpation, and volumetric asymmetry. In areas conditionally classified as "other" (including the dorsum of the hands, anterior abdominal wall, and pubic area), complications were observed in 4 of 11 cases (36.4%). Overall, the adverse outcome rate in the control group was 36.6%. The obtained data serve as a baseline clinical picture against which the immunological characteristics of patients and the types of morphological changes in complicated cases will be compared.

In the first stage, a comparative analysis of the cellular immune status in patients who underwent lipofilling, depending on the clinical outcome of the procedure, as well as in relation to a reference group of healthy individuals, revealed that the CD3⁺ T-lymphocyte level, reflecting the overall T-cell component of the immune system, did not demonstrate statistically significant differences between the groups. This may indicate the preservation of the overall T-cell pool in both patients without complications and in those who subsequently developed adverse lipofilling outcomes. Similarly, CD19⁺ B-cell counts remained within physiological norms in all subgroups, with no significant fluctuations, suggesting a limited role for the humoral component of adaptive immunity in the pathogenesis of outcomes. Differences in the CD4⁺ to CD8⁺ T-cell ratios attracted the most attention. In patients with unfavorable lipofilling outcomes, significant immunological changes were observed, including increased CD4⁺ counts, decreased CD8⁺ and NK cells, and an increased CD4⁺/CD8⁺ ratio, which may be considered markers of subclinical immune dysregulation.

To assess the prognostic value of systemic inflammatory markers and cytokines before lipofilling, a comparative analysis of serum levels of IL-6, IL-10, TNF- α , TGF- β 1 and CRP was performed in patients with different clinical outcomes, as well as in healthy reference individuals.

Levels of TNF- α , a key proinflammatory cytokine of innate immunity, were also elevated in patients with complicated outcomes. The average TNF- α level in this group was 9.2 ± 2.7 pg/ml, significantly exceeding both the reference group ($p < 0.01$) and uncomplicated patients ($p < 0.01$). This directly indicates underlying activation of the proinflammatory cascade, predisposing to an overreaction to local changes in the transplantation area. For example, patient B., 44, with a TNF- α level of 10.6 pg/ml preoperatively, developed painful infiltration just 6 weeks after buttock lipofilling, requiring aspiration and subsequent surgical drainage.

Of interest are the levels of TGF- β 1, a key regulator of fibrosis and tissue remodeling. In the group with complications, its level was 3.8 ± 1.0 ng/ml, which is significantly higher than in the reference group ($p < 0.05$) and higher than in patients without complications ($p < 0.05$). In contrast, the level of IL-10 (an anti-inflammatory regulatory cytokine) did not differ significantly between the groups. In patients with complications, IL-10 was lower than in healthy patients, but did not reach statistical significance ($p > 0.05$). This may indicate insufficient anti-inflammatory compensation in some patients, but requires further analysis in larger samples.

CRP levels also showed a consistent trend. Thus, with normal values in healthy individuals at 1.2 ± 0.4 mg/l and moderately elevated in patients without complications, CRP in the group with an unfavorable outcome increased more than 2-fold ($p < 0.001$), which may indicate the presence of subclinical inflammation prior to the intervention.

Thus, preoperative elevations in IL-6, TNF- α , TGF- β 1, and CRP may be considered an immunological predisposition to the development of lipofilling complications.

The conducted correlation analysis revealed consistent functional links between cellular immunity disturbances (especially CD4⁺/CD8⁺, CD4⁺, NK) and increased inflammatory cytokine responses (IL-6, TNF- α , CRP). These data confirm that preoperative immune imbalance may be a key predictor of adverse lipofilling outcomes and should be considered when planning preventive measures.

To establish the anatomically specific immunological changes in patients with complicated lipofilling outcomes, a comparative analysis of significant immune parameters was conducted depending on the location of the procedure.

The most pronounced changes were observed in patients who underwent breast lipofilling. This group demonstrated the highest levels of IL-6 and CRP, which significantly differed from similar values for facial lipofilling ($p < 0.05$). These differences indicate the most pronounced systemic proinflammatory activity in patients who had fat tissue injected into the mammary glands, which is likely related to both the vascular bed and tissue resistance in this area, as well as hormonal reactivity. Thus, the most pronounced deviations in significant immunological parameters in complicated lipofilling outcomes are observed in the mammary gland area. These data may directly indicate the high anatomical and functional vulnerability of this area to impaired fat graft engraftment under conditions of subclinical immune activation.

A clinical and immunological study revealed that patients with complicated lipofilling outcomes already had pronounced signs of subclinical immune imbalance preoperatively. The most significant differences in the complicated group were elevated levels of IL-6, TNF- α , CRP, and TGF- β 1, increased CD4⁺ lymphocyte counts, and the CD4⁺/CD8⁺ ratio, along with decreased CD8⁺ and NK cell counts. Significant positive correlations were also established between cellular and cytokine components of the immune system, increasing from reference values to complicated outcomes.

The most pronounced immunological disturbances were observed in breast lipofilling, consistent with the high clinical complication rate in this area. The data obtained confirm the presence of an immunological predisposition to an unfavorable outcome and can serve as the basis for developing a risk prediction system.

Conclusions:

1. A clinical and immunological study showed that patients with complicated lipofilling outcomes already had pronounced signs of subclinical immune imbalance preoperatively.
2. The most pronounced immunological disturbances were observed during lipofilling of the mammary glands, which corresponds to the high clinical complication rate in this area. The data obtained confirm the existence of an immunological predisposition to an unfavorable outcome and can serve as a basis for developing a risk prediction system.

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**BOSHLANG'ICH SINIF O'QUVCHILARIDA EKOLOGIK TAFAKKURNI
INNOVATSION YONDASHUV ASOSIDA TAKOMILLASHTIRISH METODIKASI**

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Annotatsiya

Ushbu maqolada boshlang'ich sinf o'quvchilarida ekologik tafakkurni shakllantirish va uni innovatsion yondashuvlar asosida takomillashtirish masalalari yoritilgan. Muallif ekologik ta'lim mazmuni, didaktik vositalar, interaktiv usullar va zamonaviy axborot texnologiyalari orqali o'quvchilarda ekologik ong va madaniyatni rivojlantirish metodikasini asoslab beradi.

Kalit so'zlar: ekologik tafakkur, boshlang'ich sinf, innovatsion yondashuv, metodika, ekologik tarbiya, ta'lim texnologiyalari.

Annotation

This article features issues of formation of environmental medicine on primary school students and improving it on the basis of innovative approaches. The author based on the content of environmental education, didactic means, interactive means, and modern information technology based on methodologists of environmental and culture development .

Keywords: Ecological thinking, primary school, innovative approach, methodology, environmental education, educational technologies

Аннотация

В этой статье представлены проблемы формирования экологической медицины для учащихся начальных школ и улучшения ее на основе инновационных подходов. Автор, основанный на содержании экологического образования, дидактических средств, интерактивных методов и современных информационных технологий, основанных на методологах экологического сознания и культуры.

Ключевые слова: экологическое мышление, начальная школа, инновационный подход, методология, экологическое образование, образовательные технологии.

KIRISH

XXI asrda insoniyat oldida turgan eng dolzarb muammolardan biri bu ekologik muvozanatning buzilishi va atrof-muhitga bo'lgan beparvo munosabatdir. Shu boisdan ham, ekologik ong va tafakkurni shakllantirish ta'lim tizimining barcha bosqichlarida, ayniqsa, boshlang'ich ta'lim davridayoq boshlanishi zarur. Boshlang'ich sinf o'quvchilari ekologik bilimlarni egallash, tabiatga nisbatan e'tiborli va mas'uliyatli munosabatni shakllantirishda eng muhim davrdir.

Bugungi kunda innovatsion ta'lim texnologiyalari orqali ekologik tarbiyani samarali tashkil etish imkoniyatlari kengaymoqda. Shu nuqtai nazardan, boshlang'ich sinfda ekologik tafakkurni innovatsion yondashuv asosida rivojlantirish dolzarb ilmiy-metodik muammo hisoblanadi.

Asosiy qism

1. Ekologik tafakkur tushunchasi va uning tarkibiy qismlari

Ekologik tafakkur – bu insonning tabiatga ongli munosabati, atrof-muhitdagi o‘zgarishlarni tahlil qilish va ekologik muammolarga yechim topa olish qobiliyatidir. Uning asosiy tarkibiy qismlari quyidagilardan iborat:

- **Ekologik bilimlar:** O‘quvchining tabiat, ekologik tizimlar, atrof-muhit muhofazasi haqidagi fundamental tushunchalari.
- **Ekologik qadriyatlar:** Tabiatni qadrlash, uni asrash va himoya qilishga intilish.
- **Ekologik munosabatlar:** O‘quvchining amaliy faoliyatida ekologik xulq-atvor va odatlarning namoyon bo‘lishi.

2. Innovatsion yondashuvning zarurati

An‘anaviy ta‘lim metodlari ekologik tafakkurni shakllantirishda yetarli samara bermaydi. Innovatsion yondashuvlar esa quyidagi afzalliklarga ega:

- O‘quvchilarni faol fikrlashga undaydi;
- Amaliy faoliyatga asoslanadi;
- Tashabbuskorlik va ijodkorlikni rivojlantiradi;
- Raqamli texnologiyalar yordamida ekologik muammolarni virtual ko‘rsatadi.

3. Ekologik tafakkurni rivojlantirishda qo‘llaniladigan innovatsion metodlar

a) Loyiha usuli (Project-based learning)

O‘quvchilar kichik guruhlarda ekologik mavzular asosida loyihalar ishlab chiqadilar (masalan: “Maktab hududini obodonlashtirish”, “Qog‘ozni qayta ishlash aksiyasi” va h.k.). Bu usul ekologik muammolarni tahlil qilish, yechim izlash va natijalarni taqdim etish ko‘nikmalarini shakllantiradi.

b) Ekologik ekskursiyalar va dala darslari

Tabiat qo‘ynida o‘tkaziladigan darslar bolalarda bevosita kuzatish, voqelikni anglash va tabiatga bo‘lgan mehrni oshiradi.

c) Multimedia va AR texnologiyalar

Virtual ekskursiyalar, animatsion filmlar va ekologik simulyatsiyalar orqali o‘quvchilar murakkab jarayonlarni osonroq anglaydilar. Masalan, “iNaturalist” yoki “EarthViewer” kabi ilovalar ekologik bilimlarni chuqurlashtirishda yordam beradi.

d) O‘yinga asoslangan ta‘lim (Gamification)

Ekologik viktorinalar, interaktiv o‘yinlar (masalan, “Ekologik jumboq”, “Kim ekolog?”) orqali o‘quvchilar bilimlarni o‘yin davomida egallaydilar.

4. Taklif qilinayotgan metodikaning asosiy bosqichlari

1. **Diagnostika bosqichi:** O‘quvchilarning mavjud ekologik bilim darajasini aniqlash.
2. **Rejalashtirish bosqichi:** Innovatsion metodlarni tanlash va dars mazmuniga integratsiya qilish.
3. **Amalga oshirish bosqichi:** Loyihalar, interaktiv darslar, ekskursiyalar orqali bilimlarni mustahkamlash.
4. **Refleksiya va tahlil:** O‘quvchilarning o‘zlashtirgan bilim va ko‘nikmalarini tahlil qilish, takomillashtirish yo‘llarini aniqlash.

Xulosa

Boshlang'ich sinf o'quvchilarida ekologik tafakkurni innovatsion yondashuv asosida takomillashtirish – bu nafaqat ekologik tarbiya, balki umuman ta'lim sifatini oshirishda ham muhim omildir. Ushbu maqolada taklif etilgan metodik yondashuvlar orqali o'quvchilarda ekologik ong, mas'uliyat va faol hayotiy pozitsiyani shakllantirish mumkin. Kelajakda bunday yondashuvlar kengroq miqyosda joriy etilishi ekologik madaniyatli avlodni voyaga yetkazishga xizmat qiladi.

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**ПРАВОВОЕ РЕГУЛИРОВАНИЕ ПРЕДПРИНИМАТЕЛЬСКОЙ ДЕЯТЕЛЬНОСТИ В
СФЕРЕ ПРЕДОСТАВЛЕНИЯ ТУРИСТИЧЕСКИХ УСЛУГ В УСЛОВИЯХ
ЦИФРОВОЙ РЕАЛЬНОСТИ**

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АННОТАЦИЯ

Статья посвящена исследованию договорных обязательств, возникающих при возмездном оказании туристических услуг, а также особенностям их правового регулирования. Рассматриваются правовая природа договоров в сфере туризма, специфика статуса туристских организаций, туроператоров и турагентов, их функции и разграничение ответственности. Проанализированы национальные и международные нормативные акты, регулирующие обязательства участников туристской деятельности, а также опыт зарубежных государств в данной области. Особое внимание уделено проблемам исполнения и неисполнения обязательств туристическими компаниями, с приведением примеров из практики Узбекистана и других стран. На основе проведённого анализа сформулированы рекомендации по включению в договор оказания туристских услуг ключевых условий, направленных на минимизацию правовых рисков и обеспечение защиты прав туристов. Делается вывод о необходимости гармонизации национального законодательства с международными стандартами, закреплёнными Всемирной туристской организацией. Полученные выводы и рекомендации могут быть использованы при совершенствовании договорно-правового регулирования туристских услуг.

Ключевые слова: туристские услуги, договор, обязательства, туроператор, турагент, турист, международный опыт, правовое регулирование.

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**LEGAL REGULATION OF ENTREPRENEURIAL ACTIVITIES IN THE PROVISION OF
TOURISM SERVICES IN THE CONTEXT OF DIGITAL REALITY**

ANNOTATION

The article is devoted to the study of contractual obligations arising from the paid provision of tourism services, as well as the specifics of their legal regulation. The legal nature of contracts in the field of tourism, the special status of tourism organizations, tour operators and travel agents, their functions, and the delineation of liability are examined. National and international regulatory acts governing the obligations of participants in tourism activities, as well as the experience of foreign countries in this area, are analyzed. Particular attention is paid to the problems of performance and non-performance of obligations by tourism companies, with examples drawn from the practice of Uzbekistan and other countries. Based on the analysis, recommendations are formulated for including key provisions in tourism service contracts aimed at minimizing legal risks and ensuring the protection of tourists' rights. The article concludes with the need to harmonize national legislation with international standards established by the World Tourism Organization. The findings and recommendations can be used to improve contractual and legal regulation of tourism services.

Keywords: tourism services, contract, obligations, tour operator, travel agent, tourist, international experience, legal regulation.

INTRODUCTION

Tourism is currently regarded as one of the strategic sectors of the economy of the Republic of Uzbekistan, exerting a significant impact on GDP growth, employment development, and the formation of the country's positive international image. In recent years, the state has implemented a complex of institutional reforms aimed at liberalizing the visa regime, improving transport infrastructure, and creating favorable conditions for attracting private investment into the hotel and tourism business [Presidential Decree of the Republic of Uzbekistan No. PP-5611 of January 5, 2019 "On Additional Measures for the Accelerated Development of Tourism"]. [1]

In the context of digital transformation of the global economy, entrepreneurial activities in the tourism sector of Uzbekistan are increasingly associated with the use of online platforms, digital marketing tools, and cross-border transactions. The modern tourism product is no longer limited to physical infrastructure (hotels, tour operators, agencies) but is largely mediated through digital services — mobile applications, online aggregators, and virtual reality (VR) technologies. This transformation requires a revision of legal regulation and the adaptation of national legislation to the challenges of the digital economy. [2]

Digitalization and Transformation of Tourism Entrepreneurship in Uzbekistan

The spread of global platforms (Booking.com, Airbnb, Expedia) and national digital aggregators (Bookatour, Mybooking, Trip.uz) has fundamentally reshaped the traditional model of doing business in the tourism industry of Uzbekistan. Today, entrepreneurs — hotel owners, hostels, guesthouses, tour operators, and travel agencies — increasingly depend on digital ecosystems for customer acquisition, booking services, and online payments [3].

Innovative technologies that are actively applied in global practice are gradually being implemented in Uzbekistan as well:

- Artificial Intelligence (AI) is used for personalized travel recommendations and dynamic pricing;
- Blockchain technologies provide transparency in transactions and reduce risks of fraud;

- Big Data analytics helps forecast demand and optimize marketing strategies;
- Virtual Reality (VR) tours are used for the promotion of Uzbekistan's cultural heritage, including Samarkand, Bukhara, and Khiva [UNWTO, 2023] [4].

Nevertheless, digitalization of the tourism sector generates a range of legal challenges:

1. Jurisdiction and licensing. Current legislation of Uzbekistan lacks a clear classification of short-term rentals under the Airbnb model. In many cases, hosts are not registered as individual entrepreneurs, which raises issues related to licensing, taxation, and consumer protection. According to the Law of the Republic of Uzbekistan "On Licensing, Permitting and Notification Procedures" (2021), tour operators are required to obtain licenses, while the activity of digital intermediaries remains outside of explicit regulation [5].
2. Taxation of digital services. International online platforms operate in Uzbekistan without establishing a permanent representative office, complicating taxation processes and creating unfair competition with local businesses. The introduction of VAT for foreign digital service providers (effective from January 1, 2020) has been an important step, but challenges of administration and enforcement still remain [Law of the Republic of Uzbekistan "On Taxes" (2020, as amended)] [6].
3. Consumer rights in online contracts. With the rise of electronic contracts and cross-border transactions, disputes related to refunds, service quality, and delivery deadlines have increased. The Law of the Republic of Uzbekistan "On Consumer Protection" (2019, as amended) and the Law "On Electronic Commerce" (2004, with amendments) provide general provisions, but do not contain specific rules on online tourism transactions, particularly in cross-border relations [7].
4. Personal data protection and cybersecurity. The tourism sector is one of the largest processors of personal data (passport information, banking details, travel itineraries). The Law of the Republic of Uzbekistan "On Personal Data" (2019) introduced basic principles of data protection, but its application in the tourism industry reveals an insufficient level of cybersecurity and enforcement mechanisms [OECD Digital Economy Outlook, 2022]. [8]

Comparative Legal Analysis — detailed academic account.

A comparative examination of regulatory approaches to digital tourism services reveals distinct priorities, instruments and institutional arrangements across jurisdictions. These differences reflect underlying legal traditions (civil-law vs. common-law), policy objectives (consumer protection and data privacy versus innovation and competitiveness), and the degree of state involvement in the digital economy. Below we set out the principal features of four clusters of models — the European Union, the United States, selected Asian jurisdictions, and Uzbekistan — and identify the implications of each approach for the regulation of entrepreneurial activity in the tourism sector. [9]

European Union: protection-centric, harmonised, platform-oriented regulation.

The EU model is characterised by a high degree of harmonisation and an overriding emphasis on consumer protection and personal data rights. Key instruments that affect digital tourism include the Package Travel Directive (Directive 2015/2302/EU), [10] which clarifies contractual rights and liability regimes for package travel and linked travel arrangements, and the General Data Protection Regulation (Regulation (EU) 2016/679, GDPR), which establishes stringent requirements for personal data processing, cross-border transfers and supervisory cooperation. More recently, the EU has developed platform-specific rules (e.g., the Digital Services Act and the Digital Markets Act) and

has been an active participant in international tax coordination initiatives addressing the digital economy [11].

For tourism entrepreneurs, the EU approach means clear mandatory obligations with respect to information duties, cancellation and refund rights, and data protection compliance. It also imposes platform liability and transparency obligations on intermediaries and requires national authorities to cooperate in enforcement. The one-stop-shop mechanism under the GDPR and EU-level consumer redress mechanisms (including online dispute resolution platforms) facilitate cross-border enforcement, but they also increase compliance costs for service providers. The EU model therefore prioritises consumer trust and market integrity even at the cost of heavier regulatory burdens for service providers.

United States: litigation-driven, sectoral regulation and innovation focus

The United States follows a markedly different pattern. Regulation is more fragmented: substantive consumer protection, privacy and platform liability are governed by a combination of federal statutes, sectoral rules and state law. Competition policy and fostering innovation often take precedence, and private enforcement (tort litigation and class actions) plays a central role in shaping provider behaviour. Federal agencies (notably the Federal Trade Commission) and state attorneys general enforce consumer protection standards, while states such as California have adopted comprehensive privacy legislation that affects national markets.

For tourism businesses, the U.S. environment often means greater flexibility in service design and pricing, paired with significant exposure to private litigation and state-level regulatory variation. Regulatory uncertainty is mitigated by robust case law and market mechanisms, but smaller businesses may face unpredictable liability exposure. The American model underscores the trade-off between promoting entrepreneurial dynamism and managing litigation risk.

Selected Asian models (China, Singapore, Kazakhstan): active state regulation and platform governance

Asian jurisdictions demonstrate a range of approaches but share a tendency toward proactive regulatory intervention in the platform economy. China has developed a comprehensive regulatory architecture — including laws on e-commerce, personal information protection and data security — that imposes strict obligations on platforms, data localization and government oversight. Singapore combines a pro-business stance with clear data protection rules (PDPA) and regulatory sandboxes to encourage innovation under supervised conditions. Kazakhstan has pursued digitalization policies and taken measures to regulate online service providers, including steps toward data localization and enhanced platform oversight [12].

In practice, these models place heavy compliance obligations on platform operators (registration, reporting, content and transaction monitoring) and often assign important enforcement and coordination roles to state agencies. For tourism entrepreneurs, the Asian approaches can provide legal certainty and rapid state-led market integration, but they also require significant regulatory compliance and may limit operational autonomy [13].

Uzbekistan: evolving framework, regulatory gaps and reform momentum.

Uzbekistan's regulatory framework is in a transitional phase. Recent policy initiatives (e.g., tourism development programmes, legislative steps on e-commerce and personal data protection) signal an intent to modernize the legal environment and to stimulate digital tourism. Domestic laws establishing

basic consumer rights and data protection principles provide an important foundation; however, several structural gaps remain salient for tourism entrepreneurship: unclear legal status and licensing regime for short-term rental platforms and digital intermediaries; uneven application and enforcement of tax rules for foreign digital service providers; limited sector-specific rules for electronic tourism [14] contracts and cross-border dispute resolution; and weaknesses in practical data-protection enforcement and cyber-security capacities.

The Uzbek case illustrates the difficulties states face when rapid digital adoption outpaces institutional capacity. While current reforms indicate alignment with international standards, the absence of tailored rules for platform liability, electronic contracting in tourism, and effective cross-border enforcement mechanisms undermines both consumer protection and the predictable legal environment entrepreneurs require [15].

Synthesis and policy implications for tourism regulation

Comparative analysis exposes several trade-offs that policymakers must weigh when designing legal regimes for digital tourism services:

Consumer protection vs. innovation costs. The EU model maximises consumer safeguards but increases compliance costs; the U.S. model favours innovation and market dynamism but shifts risk to litigation; Asian models often achieve rapid regulatory integration via strong state intervention, at the expense of operational freedom for platforms [16].

Centralised harmonisation vs. jurisdictional flexibility. Harmonised rules (GDPR, EU directives) simplify cross-border operations but require sophisticated compliance infrastructure; fragmented systems create legal uncertainty for cross-border tourism services.

Platform governance and liability. Effective regulation of intermediaries (transparency, accountability, registration) is necessary to protect consumers in digital markets; models differ in the extent to which liability is placed on platforms versus service providers [17].

Taxation and market fairness. Coordinated international tax rules and domestic measures (e.g., VAT on foreign digital services) are critical to prevent regulatory arbitrage and ensure fair competition between local and foreign providers.

For Uzbekistan, the comparative panorama suggests a pragmatic hybrid approach: adopt clear consumer-protection and data-protection standards comparable to international best practices (to build trust), introduce proportionate but enforceable obligations for digital intermediaries (to ensure accountability), improve tax administration for cross-border digital services (to secure fair competition), and foster regulatory sandboxes and capacity-building to support innovation while testing new regulatory instruments. Such an approach would reconcile the competing objectives of consumer protection, market development and technological innovation in the tourism sector [18].

Prospects for Uzbekistan — detailed policy and legal measures

The digitalisation of the tourism sector presents Uzbekistan with a dual policy challenge: to foster innovation and market entry by digital entrepreneurs while creating a predictable, rights-respecting regulatory environment for consumers and service providers. The following expanded measures set out concrete legal and institutional directions, implementation steps, and foreseeable challenges [19].

1. Adopt clear rules on digital contracts and consumer protection in online tourism services. Electronic contracts underpin most cross-border and domestic online tourism transactions; unclear rules increase disputes and reduce consumer trust. Recommended legal instruments and steps: amend

consumer protection and e-commerce legislation to specify requirements for online tourism contracts (pre-contractual disclosure, standard terms, cancellation and refund regimes, automatic renewal rules); introduce mandatory minimum content for online booking confirmations (price breakdowns, cancellation policy, third-party services, complaint procedures); require platforms and providers to implement accessible electronic notice and consent mechanisms and to preserve transaction records for a defined retention period; create tailored consumer information obligations for tourism (e.g., language of contract, passports/visa information, insurance disclaimers).

Institutional actions: empower consumer protection authorities and tourism regulators to monitor platform compliance and operate hotlines/portals for complaints. Risk of over-prescription that stifles innovation can be mitigated by outcome-based rules (transparency + remedies) rather than prescriptive technical standards. Reduced transactional disputes, higher consumer confidence, clearer allocation of contractual liability between platforms and service providers.

2. Develop a comprehensive framework for personal data protection and cybersecurity

Rationale. Tourism services process sensitive personal and payment data; weak safeguards expose citizens to fraud and reputational harm for providers. Recommended legal instruments and steps: strengthen the national personal data law with sectoral guidance for tourism (data minimisation, retention limits, special requirements for passport and payment data); adopt technical and organisational cybersecurity standards for tourism enterprises (incident response, encryption, access control, regular audits); define lawful bases for cross-border transfers (standard contractual clauses, approved adequacy mechanisms) tailored to tourism flows; establish mandatory breach notification timelines and require notification to affected individuals and a supervisory authority.

Institutional actions: capacity building for data protection authorities, certification schemes for compliant tourism platforms, and public-private ‘cyber hygiene’ initiatives. Balancing data localisation instincts with need for cross-border interoperability — address by explicit, proportional transfer safeguards rather than blanket bans. higher resilience against cyber incidents, harmonised handling of personal data by hotels, platforms and agents, and improved international interoperability.

3. Harmonize national legislation with international standards, especially on taxation and licensing of online platforms

Rationale. Misalignment with international norms creates administrative frictions, tax base erosion and unfair competition.

Recommended legal instruments and steps:

- Clarify the legal status and licensing requirements for digital intermediaries (platforms, OTA, short-term rental hosts) within tourism law or by regulation, specifying which activities trigger licensing or registration.
- Introduce clear tax rules for cross-border digital services (registration thresholds, VAT registration and collection mechanisms for foreign providers, reporting obligations).
- Align personal data, consumer protection and electronic identification rules with internationally recognised instruments to facilitate inbound tourism and foreign investment.

Institutional actions: interagency taskforce (tourism, tax, communications, justice) to coordinate implementation; use bilateral and multilateral forums to enforce tax and regulatory rules on foreign providers.

Challenges & mitigations: enforcement against non-resident providers; mitigate through platform liability rules, marketplace collection obligations, and cooperation agreements with major platform operators.

Expected outcome: level playing field between domestic and foreign providers, improved tax compliance, clearer regulatory perimeter for digital tourism services.

4. Establish alternative dispute resolution (ADR) mechanisms for cross-border tourism disputes

Rationale. Judicial processes are slow and costly for cross-border tourism disputes; ADR increases access to remedies and reduces litigation burden.

Recommended legal instruments and steps:

- Create an accredited online dispute resolution (ODR) platform for tourism complaints, integrated with consumer protection authorities and payment-card chargeback systems.
- Legislate for enforceability of ADR decisions within a domestic framework and provide pathways to limited judicial review.
- Encourage industry codes of conduct with mandatory ADR clauses for platforms and tour operators.

Institutional actions: set up a specialised tourism ADR body or designate existing consumer ombudsman with online jurisdiction and multilingual capacity.

Challenges & mitigations: ensuring enforceability across borders — pursue recognition agreements and incorporate ADR clauses into standard contracts used by platforms.

Expected outcome: faster, cheaper resolution of consumer disputes, lower reputational risk for the sector, and better aggregated data to inform policy.

5. Introduce state-supported digital platforms integrating local tourism services with international markets

Rationale. A public-private digital aggregator can raise market visibility of local suppliers, improve regulatory oversight, and foster exportable tourism products.

Recommended legal instruments and steps: design a state-backed marketplace/API hub that aggregates licensed local hotels, guides and tour operators, guaranteeing compliance with national quality and data standards; establish governance rules for the platform (service level obligations, dispute escalation, data sharing protocols) and enable voluntary integration with private OTAs; promote public-private partnerships (PPP) and provide incentives (training, digital grants) for SMEs to onboard the platform.

Assign a lead body (tourism ministry/board) to manage platform strategy, ensure interoperability with existing booking systems, and provide cybersecurity oversight.

Challenges & mitigations: avoid crowding out private innovation by positioning the state platform as an enabler and certification mark rather than a monopoly distributor. Increased visibility of domestic tourism supply, improved compliance with regulatory norms, and enhanced capacity for market analytics and crisis response.

A coherent package combining the five measures above — clear e-contract rules, robust data and cybersecurity regimes, harmonised taxation and licensing, accessible ADR mechanisms, and state-enabled digital infrastructure — would materially strengthen Uzbekistan's legal environment for digital tourism entrepreneurship. Implementation will require phased legislative amendments,

interagency coordination, capacity building for regulators and industry, and stakeholder engagement (platforms, insurers, banks, consumer associations). If well calibrated, these reforms can both stimulate innovation in the tourism sector and safeguard consumer rights, thereby supporting sustainable growth of Uzbekistan's tourism economy.

Conclusion

The digital transformation of tourism entrepreneurship in Uzbekistan is not only reshaping the structure of the national tourism industry but also redefining the role of legal regulation in ensuring sustainable development. On the one hand, digital platforms and innovative business models significantly expand access to international markets, enhance service quality, and increase the competitiveness of tourism enterprises. On the other hand, the rapid pace of technological change has revealed a range of unresolved legal and institutional issues that must be addressed in order to achieve long-term stability and growth.

First, the gaps in licensing and taxation of digital platforms remain a pressing concern. While global platforms such as Booking.com and Airbnb operate widely in Uzbekistan, the absence of a comprehensive taxation and licensing framework creates regulatory asymmetry between international digital providers and domestic tourism businesses. Without effective oversight, the state risks revenue losses, while local enterprises face unfair competition. Addressing these issues requires harmonization of national tax rules with international standards and the introduction of clear legal provisions for online intermediaries.

Second, consumer protection in digital tourism transactions is a critical area for legal reform. Online booking, cross-border payments, and electronic contracts often leave consumers vulnerable to unfair practices, lack of transparency, and difficulties in dispute resolution. Comparative experience from the European Union demonstrates the importance of establishing binding obligations for disclosure of information, refund mechanisms, and guarantees of consumer rights in the online environment. For Uzbekistan, the adoption of similar standards would enhance consumer confidence and increase the attractiveness of the national tourism market.

Third, the protection of personal data and cybersecurity emerges as one of the most sensitive issues in the digitalization of tourism. Hotels, travel agencies, and online platforms process large volumes of personal information, including biometric and financial data. Weak safeguards not only endanger consumer privacy but also undermine international trust in the country's tourism infrastructure. Strengthening the national framework for personal data protection and aligning it with international instruments, such as the EU's GDPR, will be a decisive step toward ensuring data security and fostering cross-border cooperation.

Fourth, the creation of effective mechanisms of dispute resolution is essential in the context of digital tourism. Traditional court procedures are often lengthy and ill-suited for resolving low-value, high-volume disputes that characterize online tourism transactions. Therefore, the development of alternative and online dispute resolution (ADR/ODR) mechanisms would allow consumers and businesses to settle disputes efficiently and cost-effectively, while also reducing the burden on judicial institutions.

Finally, the long-term success of Uzbekistan's digital tourism strategy depends on the establishment of state-supported digital platforms that integrate local tourism services with international markets. Such platforms could serve as a guarantee of quality and compliance with national regulations, while

also supporting small and medium-sized enterprises in accessing digital ecosystems. However, their development must be carefully balanced to avoid overregulation or the suppression of private sector innovation.

In conclusion, the legal regulation of entrepreneurial activities in the provision of tourism services in the digital era is a multidimensional challenge requiring an integrated approach. It involves not only the modernization of substantive and procedural laws but also the strengthening of institutional capacity, inter-agency coordination, and cooperation with international organizations. For Uzbekistan, the digitalization of tourism presents a strategic opportunity: by adopting international best practices while adapting them to national realities, the country can create a resilient and transparent legal environment. Such an environment will safeguard consumer rights, reduce business risks, and position Uzbekistan as a competitive and trustworthy destination in the global tourism market.

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БИОХИМИЧЕСКИЙ СОСТАВ И ЭКОЛОГИЧЕСКАЯ РОЛЬ САКСАУЛОВОЙ КОБОЧКИ (Haloxylon)

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Введение

Саксауловая кобочка (*Haloxylon bucri*) — это вид саранчовых насекомых, встречающийся в пустынных и полупустынных районах Узбекистана, играющий важную роль в поддержании устойчивости экосистем. Основным кормом этого вида служат растения саксаула, при этом он не наносит вреда сельскохозяйственным культурам. В последние годы растет интерес к изучению его экологической роли, пищевой ценности и экономического значения. Исследования показывают, что данный вид содержит высокий уровень белка и полезных жирных кислот, а также является важным источником питания для животных.

Основная часть

Саксауловая кобочка относится к семейству Acrididae и широко распространена в пустынях Узбекистана, Туркменистана и Казахстана. Длина её тела составляет 3–4 см, окраска зелёная, сходная с листьями саксаула, что способствует маскировке. Благодаря способности прыгать и летать на большие расстояния, насекомое может находить пищу на обширных территориях. В экосистеме оно играет важную роль в регулировании численности растений, стабилизации пищевых цепей и сохранении биологического разнообразия.

С точки зрения питания саксауловая кобочка является высокоценным продуктом. До 60–70% её массы составляет белок — показатель, значительно превышающий содержание белка в мясе. Доля жиров — около 15–20%, при этом преобладают ненасыщенные жирные кислоты. В составе насекомого присутствуют кальций, железо, магний и цинк, а также витамины А, В и Е, способствующие укреплению костной, мышечной и иммунной систем.

На глобальном уровне саранчовые рассматриваются как устойчивый источник белка. В странах Африки и Азии существует традиция употребления саранчи в пищу. Она используется как источник энергии, пищевая добавка и корм для животных. Саксауловая кобочка, благодаря низким требованиям к воде и питанию с саксаулом, является экологически устойчивым ресурсом.

Рентгено-флуоресцентный анализ (XRF) показал, что в теле кобочки содержатся калий (31,8%), кальций (23,2%), фосфор (7,47%) и сера (6,11%). Эти элементы подтверждают богатое содержание биологически активных веществ. Наличие микроэлементов, таких как железо, цинк и медь, свидетельствует об их участии в важных метаболических процессах организма.

Экономическая ценность саксауловой кобочки проявляется в нескольких аспектах. Во-первых, сбор и переработка саранчи создают новые рабочие места. Например, в Африке сельские жители собирают, сушат, жарят и продают саранчу, тем самым повышая доход своих семей. Во-вторых, переработка саранчи в белковые продукты способствует развитию пищевой промышленности — производству смесей и белковых кондитерских изделий, открывая новые возможности для инновационного бизнеса и стартапов. В-третьих, саранча является естественным источником питания для птиц, рептилий и мелких млекопитающих. Её высокий уровень белков и витаминов способствует здоровому росту животных и повышает их репродуктивные способности. Кроме того, саксауловая кобочка экономически выгодна благодаря экологической устойчивости — она не требует большого количества воды, удобрений и других ресурсов, что делает процесс её сбора и переработки более эффективным.

В глобальной продовольственной системе саксауловая кобочка имеет значение как устойчивый ресурс. В засушливых районах, где производство мяса и молока затруднено, она играет важную роль как источник белка. Массовый сбор саранчи осуществляется без нанесения вреда естественным экосистемам, что способствует сохранению экологического баланса. Кроме того, саранча способна выживать в засушливых и полупустынных условиях, что делает её менее уязвимой к изменению климата и устойчивым источником пищи. Высокое содержание белка и витаминов способствует укреплению здоровья людей и животных, повышая уровень продовольственной безопасности.

По мировым статистическим данным, около 2 миллиардов человек на планете употребляют в пищу саранчу и других насекомых. Содержание белка в саранче выше, чем в традиционном мясе: в 100 г сухого продукта содержится 60–70 г белка. Благодаря этому она является энергетически эффективным и питательным источником. Экономически отрасль переработки саранчи стремительно развивается: только в Азии и Африке её потенциал оценивается в миллиарды долларов. Таким образом, саксауловая кобочка представляет собой устойчивый, питательный и экономически выгодный ресурс в мировой продовольственной системе.

Рост численности саранчи иногда может наносить ущерб сельскому хозяйству, особенно при совместном распространении с вредными видами. Поэтому применяются меры мониторинга и контроля:

1. Химическая обработка (только против вредных видов).
2. Биологическая борьба (с использованием естественных хищников и паразитов).
3. Наблюдение за популяцией (оценка стадий жизненного цикла и ареалов распространения).
4. Эти мероприятия способствуют сохранению экологического равновесия и снижению ущерба, связанного с деятельностью человека.

Заключение

Саксауловая кобочка (*Haloxylon bucri*) является экологически, пищево и экономически важным организмом. Она играет ключевую роль в пищевой цепи экосистем, регулируя численность растений и обеспечивая кормовую базу для животных. Высокое содержание белков и полезных жиров делает этот вид ценным для здоровья человека и животных. В перспективе необходимо расширять использование саксауловой кобочки как пищевого источника, а также усиливать научные исследования и экологический мониторинг. Это будет способствовать развитию устойчивой продовольственной системы и обеспечению продовольственной безопасности в засушливых регионах.

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ВЛИЯНИЕ БИНАРНЫХ КОМПЛЕКСОВ МАРГАНЦА И СЕРЫ НА ЭЛЕКТРОФИЗИЧЕСКИЕ СВОЙСТВА КРЕМНИЯ

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Аннотация

Современное развитие микро- и оптоэлектроники требует создания новых функциональных материалов, способных совмещать в себе управляемые электрические, оптические и магнитные свойства. Кремний, являющийся базовым материалом полупроводниковой промышленности, обладает рядом уникальных характеристик, однако его стандартные параметры не всегда удовлетворяют возросшим требованиям к приборам нового поколения. В этой связи большое внимание уделяется модификации свойств кремния за счёт примесного легирования и образования сложных дефектных комплексов.

Особый интерес вызывает совместное внедрение атомов переходных металлов и элементов VI группы, поскольку именно такая комбинация позволяет формировать устойчивые дефектные структуры с новыми энергетическими характеристиками. Марганец (Mn), как представитель 3d-переходных металлов, известен способностью формировать глубокие уровни в запрещённой зоне кремния. Эти уровни оказывают сильное влияние на процессы рекомбинации носителей заряда, сокращая их время жизни, что обычно считается неблагоприятным фактором для традиционной электроники. Однако именно эти свойства открывают перспективы для применения марганца в спинтронных устройствах и системах, основанных на управлении рекомбинацией.

Ключевые слова: Кремний, марганец, сера, бинарные комплексы, глубокие уровни, рекомбинация, фотопроводимость, спинтроника, дефектные состояния, термостабильность.

Abstract

The modern development of micro- and optoelectronics requires the creation of new functional materials capable of combining controlled electrical, optical, and magnetic properties. Silicon, a fundamental material in the semiconductor industry, possesses a number of unique characteristics, but its standard parameters do not always meet the increased requirements for next-generation devices. Therefore, considerable attention is being paid to modifying silicon's properties through impurity doping and the formation of complex defect complexes.

The combined incorporation of transition metal atoms and Group VI elements is of particular interest, as this combination enables the formation of stable defect structures with new energy characteristics. Manganese (Mn), a 3d transition metal, is known for its ability to form deep levels in the silicon band gap. These levels have a strong influence on charge carrier recombination processes, shortening their lifetimes, which is generally considered unfavorable for traditional electronics. However, these very properties offer promising applications for manganese in spintronic devices and systems based on recombination control.

Keywords: Silicon, manganese, sulfur, binary complexes, deep levels, recombination, photoconductivity, spintronics, defect states, thermal stability.

Введение. Кремний занимает центральное место в микроэлектронике и оптоэлектронике благодаря своей доступности, стабильности и технологичности. Тем не менее современные задачи электроники требуют от материалов значительно более широких функциональных характеристик, чем традиционные параметры кремния. Одним из направлений, позволяющих существенно изменить свойства этого полупроводника, является примесное легирование.

Исторически легирование кремния бором и фосфором дало возможность управлять типом проводимости и создавать p-n-переходы, что стало основой современной микроэлектроники. Однако развитие новых технологий – солнечной энергетики, квантовой электроники, спинтроники – показало необходимость внедрения в кремний нестандартных примесей, способных создавать новые уровни в запрещённой зоне и обеспечивать появление дополнительных физических эффектов.

Переходные металлы, в частности марганец, представляют особый интерес в связи с их способностью формировать глубокие уровни в запрещённой зоне кремния. Эти уровни изменяют рекомбинационные процессы и могут использоваться для управления временем жизни носителей заряда. Но при этом марганец в чистом виде приводит к сильному уменьшению времени жизни носителей, что ограничивает его применение в традиционных электронных приборах.

Элементы VI группы, такие как сера, селен или теллур, формируют донорно-акцепторные центры, способные расширять спектральный диапазон фоточувствительности кремния. Однако их одиночное внедрение не всегда обеспечивает требуемую стабильность.

Поэтому особый интерес представляет бинарное легирование кремния марганцем и серой, что приводит к образованию комплексов «Mn–S». Такие комплексы сочетают свойства обоих компонентов: сера стабилизирует дефектные центры, а марганец обеспечивает формирование новых энергетических уровней и возможность реализации спин-зависимых эффектов. Это создаёт фундамент для получения материалов с уникальными электрофизическими параметрами, которые востребованы в новых поколениях микро- и оптоэлектронных устройств.

Основная часть. Образование комплексов «Mn–S» в кремнии происходит при совместной имплантации этих элементов с последующим отжигом в диапазоне температур 700–900 °С. При таких условиях марганец, внедряющийся в междоузельные позиции, взаимодействует с серой, находящейся в замещённых позициях, образуя устойчивые бинарные комплексы.

Экспериментальные исследования с использованием спектроскопии глубоких уровней (DLTS) показали, что в образцах с комплексами «Mn–S» появляются новые уровни на глубине 0,32–0,36 эВ от зоны проводимости. Эти уровни отсутствуют в кремнии, легированном только марганцем или только серой, что указывает на бинарную природу дефектов.

Измерения фотопроводимости продемонстрировали расширение спектральной чувствительности кремния до 1,2 мкм. Это объясняется влиянием серы, которая в комплексе с марганцем формирует более устойчивые донорные уровни. Таким образом, комплексное легирование открывает перспективы использования кремния в инфракрасных фотоприёмниках.

Кроме того, электронно-микроскопические исследования выявили, что комплексы «Mn–S» препятствуют кластеризации атомов марганца, которая обычно наблюдается при высоких концентрациях. Это приводит к повышению однородности материала и улучшению его стабильности.

Теоретические расчёты методом функционала плотности подтвердили, что энергия образования комплексов «Mn–S» ниже, чем у отдельных атомов, что объясняет их устойчивость. Более того, расчёты показали сохранение спиновых состояний марганца, что делает такие комплексы перспективными для применения в спинтронных устройствах.

Таким образом, комплексное легирование кремния марганцем и серой приводит к формированию дефектов с новыми свойствами, которые сочетают в себе преимущества обоих элементов и компенсируют их отдельные недостатки.

Заключение. Проведённое исследование влияния бинарных комплексов марганца и серы на свойства кремния позволяет сделать следующие выводы:

1. Совместное легирование марганцем и серой приводит к образованию устойчивых комплексов «Mn–S», обладающих термодинамической стабильностью и новыми энергетическими характеристиками.
2. Эти комплексы формируют новые уровни в запрещённой зоне кремния, которые отсутствуют при одиночном легировании, и обеспечивают возможность управления рекомбинационными процессами.
3. Комплексы «Mn–S» расширяют спектральную область фоточувствительности кремния до ближнего инфракрасного диапазона, что делает их перспективными для применения в солнечных элементах и фотоприёмниках.
4. Теоретические и экспериментальные данные указывают на сохранение спиновых свойств марганца в составе комплексов, что открывает перспективы применения таких материалов в спинтронике.

Практическая значимость результатов заключается в создании предпосылок для разработки новых поколений кремниевых материалов с регулируемыми свойствами. Это открывает путь к созданию более эффективных и multifunctional электронных устройств, соответствующих современным требованиям.

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НАЛИЧИЕ СИНОНИМИИ И ПОЛИСЕМИИ В ТЕРМИНОЛОГИИ РАСТЕНИЕВОДСТВА

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Аннотация. В лингвистике синонимия и полисемия являются близкими, но различными явлениями. Синонимия — это наличие лексических единиц с одинаковым или сходным значением, тогда как полисемия объясняется способностью одного слова выражать разные значения в зависимости от контекста. В терминологии растениеводства данные явления широко распространены: разнообразие терминов, возникших в научной литературе, устном народном творчестве, религиозных и практических источниках, приводит к их употреблению в синонимической или полисемической форме.

Ключевые слова: лексико-терминологические синонимы, терминологическая точность, семантика терминов, перевод и транскрипция, лексические единицы, омонимы, семантические слои, потенциальная путаница, контрастный подход, лексико-семантический анализ, этимологические исследования.

Annotation. In linguistics, synonymy and polysemy are closely related but distinct phenomena. Synonymy refers to the existence of lexical units with the same or similar meanings, whereas polysemy is explained by the ability of a single word to convey different meanings depending on the context. In plant science terminology, these phenomena are widespread: the diversity of terms that emerged in scientific literature, oral folklore, religious and practical sources has led to their usage in synonymous or polysemous forms.

Keywords: lexical-terminological synonyms, terminological accuracy, term semantics, translation and transcription, lexical units, homonyms, semantic layers, potential confusion, contrastive approach, lexical-semantic analysis, etymological research.

В терминологии растениеводства наличие синонимии и полисемии, хотя и является естественным языковым явлением, в научной сфере противоречит требованиям точности и последовательности. Анализ, проведённый на основе новых названий растений, показал необходимость обеспечения лексико-

семантической последовательности в языкознании, повышения точности в переводе и изучения научных источников на сравнительной основе.

Одним из актуальных направлений современной лексикологии является семантика терминов, в частности проблемы, связанные с синонимией и полисемией. С развитием науки и техники терминологическая система также обогащается, и многозначность (полисемия) и близость значений (синонимия) находят своё отражение в терминологии. В данной статье на основе новых терминов в области растениеводства (ботаники) проводится анализ явлений синонимии и полисемии.

Синонимия и её терминологические особенности: Синонимия – это система различных выражений, обозначающих одно и то же или очень близкое значение. В научной терминологии синонимия встречается редко, однако в процессе естественного развития языка формируются лексико-терминологические синонимы.

Синонимичные термины в растениеводстве: В следующих примерах наблюдается использование некоторых названий растений или их частей в разных источниках в качестве синонимов.

Термин 1	Термин 2	Пояснение
Япроктомир	Найчатош	Оба термина обозначают систему жилок в листьях растений, однако один заимствован из народной речи, другой — из научных источников.
Шудринг	Dew (англ.)	В узбекском языке слово «шудринг» иногда употребляется в значении «утренние капли влаги». Английское «dew» используется в биологической литературе именно в этом значении.
Кукарган	Нихол	Оба слова обозначают начальную стадию роста растения. «Нихол» — более официальный термин, «кукарган» — разговорное слово.

Анализ: Синонимичные термины могут создавать вариативность в тексте, однако в случаях, где требуется научная точность, важно выбрать один вариант. Особенно при переводе неправильный выбор синонима может привести к ошибочной интерпретации.

Полисемия и её роль в терминологии: Полисемия – это употребление одного слова в нескольких, близких или различных значениях. В научных языках данное

явление может вызывать семантическую неопределённость. Однако оно является важным процессом в развитии языка.

Полисемичные термины в растениеводстве:

Слово	Значение 1	Значение 2
Гузапая	Растение, из которого получают хлопок	Употребляется как термин в значении «сезон хлопководства» («гузапая ишлари»)
Шора	Вид солеустойчивого растения	В некоторых регионах это слово также используется в значении «бесплодная земля»
Поя	Стебель растения	«Бессодержательная речь» (переносное значение) — пример семантического сдвига в языкознании

Анализ: Полисемичные единицы проявляют своё значение в зависимости от контекста. В научных текстах предотвращение неопределённости возможно за счёт чёткого указания контекста. В переводе же игнорирование этих различий приводит к семантическим ошибкам.

Новые термины растениеводства и их лексико-семантические особенности:

В последние годы в узбекском научном языке появились следующие новые термины:

Новый термин	Значение	Синонимичное или полисемичное состояние
Фитопатоген	Микроорганизмы, вызывающие болезни растений	Синоним: паразит растений (в некоторых случаях)
Микрофлора	Совокупность микроорганизмов в почве	Полисемичен: используется и в других биологических областях
Нодуляр	Узлы, образующиеся на корнях бобовых растений	Синоним: корневые узлы
Транспирация	Испарение воды через растения	Синоним: дыхание (иногда ошибочно подменяется)

Новый термин	Значение	Синонимичное или полисемичное состояние
Каллус	Искусственно образованное новообразование в тканях растений	Синоним: ткань роста (неофициально)

Анализ синонимичных и полисемичных терминов растениеводства показывает, что семантические слои лексических единиц в этой области сложны и многогранны. Для лингвистов и переводчиков учёт этих особенностей играет важную роль в обеспечении научной точности и сохранении терминологической согласованности.

В будущем на основе компьютерной лингвистики, автоматического перевода и научных корпусов необходимо создавать многоязычные словари по синонимам и полисемичным единицам в этой области.

Анализ по синонимии и полисемии: Некоторые растения отличаются тем, что имеют несколько названий, а одно название может относиться к другим растениям:

Растение	Синонимы	Потенциальная путаница
Имбирь	Ginger, жанджабиль	Пищевой имбирь может путаться с лекарственным
Калонджи	Чёрный тмин, black seed	Часто смешивается с «black cumin»
Бораго	Асалои, гол-е гавзабан	Различие между ботаническим и народным названием
Укроп	Арпабодион, шивид	В общественном языке может иметь другое значение (в английском)

Семантические проблемы в переводе и транскрипции:

Во многих случаях арабские или персидские термины при переводе подвергаются семантическому расширению или сужению. Например:

- **Шора** – иногда переводится как *saltwort*, однако этот термин употребляется редко и не имеет точной идентификации.
- **Тут** – переводится как *mulberry*, но в зависимости от разновидностей (белая, чёрная, красная) может не иметь точного разграничения в английском языке.

Вывод: Анализ выше показал, что лексико-семантические проблемы в терминологии растениеводства во многом связаны с:

- историко-культурным контекстом,
- адаптацией многотерминности,
- синонимией и полисемической средой,
- ошибками перевода и транскрипции.

Это требует последовательного и стандартизированного употребления названий растений. В исследованиях решение подобных вопросов возможно через контрастивный подход, лексико-семантический анализ и этимологические исследования.

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THE STUDY OF AGRICULTURAL, PARTICULARLY BOTANICAL MATERIALS, IN LINGUISTICS

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Annotation: *The article studies the lexical-semantic properties of agricultural, and in particular plant science, terms using the example of historical literature.*

Keywords: *Lexical-semantic, archaic term, stylistics, grammar, phonetics, text in linguistics, speech activity, discourse, terminology, translation theory, extralinguistic factors of lexical units.*

As linguistics has advanced in areas such as text, speech activity, discourse, terminology, and translation theory, the need to study specialized texts has also increased. In plant science texts, scientific terms, their structure, translation, stylistic features, and their role within professional discourse are analyzed through various linguistic methods. However, the number of studies in this direction is still limited, with most remaining within the framework of general terminology or translation issues. This study examines the state of research on agricultural texts, especially those related to plant science, within linguistics, exploring existing approaches, linguistic features, translation problems, and promising research directions in this field. The relevance of this work lies in the fact that it represents a vivid example of language and interdisciplinary integration, allowing for an in-depth theoretical and practical analysis of specialized speech and text.

Terms constitute the main units of this field. While phonetics, stylistics, and grammar are the same in general language and in any scientific domain, the vocabulary differs. Therefore, a distinction is made between general vocabulary and terminological vocabulary. The lexical composition of each terminological system differs from others, which is of great importance in language. According to S.V. Grineva, “Today, the rapid growth of scientific and technical knowledge shows that more than 90 % of new words in modern language consist of specialized vocabulary. The number of terms in different sciences is growing faster than the number of frequently used words in language. Therefore, at present, the number of terms in certain fields (chemistry, biology) may exceed the number of non-specialized words.” This indicates the rapid development of terminology. Thus, a special language consists of special terms, the number of which corresponds to the number of scientific fields. For example, agricultural terms. Unlike commonly used vocabulary, specialized vocabulary as terms has specific features

related to its restricted usage and purpose. Therefore, for non-specialists, these terms may be difficult to understand.

The study revealed that in Uzbekistan, only a few research works have been conducted on agricultural, particularly plant science, terminology, and that dictionaries in this field remain insufficient. Existing dictionaries mostly include the names of plants growing in Central Asia, which is not enough for today's rapidly developing country. Any event or change in society is first reflected in language. Throughout historical and socio-economic development, the vocabulary of a language constantly evolves. This enrichment occurs through the emergence of new words and names that express new concepts. The vocabulary and lexical-semantic system of a language are always in flux; in modern conditions, words denoting obsolete concepts become archaic, replaced by new ones. However, the number of words falling out of use is often much smaller than the number of new ones. Yet, the opposite can sometimes occur. The disappearance of lexical units is linked to linguistic and extralinguistic factors, based on the laws of language nature and development. Two main phenomena are observed in this process: In the course of globalization, obsolete objects and phenomena, along with the words that designate them, leave the vocabulary system and become historical words; In the development of language, lexical units disappear if they fail to properly express the essence of an object or phenomenon, and are replaced by new words that accurately reflect it; The continuous enrichment of vocabulary is one of the main laws of language development. Lexical development takes different forms in different historical periods of society. Russian linguist E.A.Zemskaya wrote: "If a new word were created entirely disconnected from the old one, mastering the language would be very difficult, if not impossible." The expansion of vocabulary serves to facilitate usage and, most importantly, to express real-world interconnected phenomena through interrelated words. Thus, the interconnection of words in language reflects the relationship between real objects and phenomena.

The vocabulary of a language constantly expands with new words, ensuring the development of the language itself. A large proportion of new words are terms. Scientific and technological progress generates new terms, while, at the same time, terms create a foundation for scientific and technological progress. Indeed, a scientific or industrial field that has not been terminologically developed cannot progress as expected. At certain stages of social development, the terminology of a field extends beyond its narrow scope and comes into wide use in general speech. This means that plant science terms are used not only in specialized contexts but also in everyday language.

There are several problems in translating agricultural and plant science terms from English into Uzbek, most of which trace back to their historical development. The polymath, physician, and philosopher known in the West as Avicenna (Abu Ali ibn Sina) devoted much attention to plant science, since most medicinal substances in medicine are derived from plants. In the “*Kitab ash-Shifa*” (*The Book of Healing*), particularly in its “Anna-bot” (“Plants”) section, he wrote about plant types, origins, nutrition, organs and their functions, reproduction, and growth conditions, also contributing to the creation of scientific terminology. For thousands of years, medicinal plants have been the foundation of healthcare, and many are still used today in traditional medicine or as the basis for modern pharmaceuticals. In Avicenna’s “*The Canon of Medicine*”, numerous plants with healing properties are described, many of which have been confirmed by modern science. These plants offer a range of therapeutic effects, including anti-inflammatory properties. As research expanded, plant science terminology naturally grew as well.

Ibn Sina, a Central Asian who spoke Persian (Farsi-Dari), often composed quatrains in this language “to bring peace to the heart.” However, he completed “*The Canon of Medicine*” in Arabic. “*The Canon of Medicine*” was translated into many languages, including Uzbek and Russian, with the participation of Orientalist scholars and specialists. In Uzbek, the translation was significantly contributed to by A.Rasulev, S.Mirzayev, U.Karimov, A.Murodov, A.Qayumov, A.Urinboyev, and Q.Munirov. The Russian translation involved M.A.Salye, U.Karimov, Yu.N.Zavadovsky, P.G.Bulgakov, S.Mirzayev, and A.Rasulov.

The Uzbek translation of “*The Canon of Medicine*” was revised in 1980, on the occasion of Ibn Sina’s 1000th anniversary. This translation, prepared by U. Karimov, was published between 1979 and 1983. Since then, the work has been republished several times in both Uzbek and Russian, in both shortened and complete versions. Thus, many scholars participated in translating “*The Canon of Medicine*” into different languages, with A.Rasulev, S.Mirzayev, and U.Karimov playing particularly important roles in the Uzbek version.

Written by Ibn Sina, “*The Canon of Medicine*” is one of the most important works of medieval medicine. After its translation into Latin, it spread widely in Europe and became the foundation of medieval medicine. Both Ibn Sina’s “*Kitab ash-Shifa*” (*The Book of Healing*) and “*The Canon of Medicine*” have been translated into many languages. For example, into English from Urdu by scholars such as Faquir Muhammad Hunzai, Rashida Nurmohamed-Hunzai, and Brigham Young University researchers Marmura and E.Michael.

While working on my dissertation topic, I also studied Zahiriddin Muhammad Babur's "*Baburnama*". This work contains scientifically grounded observations and conclusions related to social and natural sciences, history, philosophy, jurisprudence, theology, linguistics, geography, natural sciences, mineralogy, agriculture, horticulture, and more, which still retain their historical and scientific significance. Since the 16th century, "*Baburnama*" has been translated multiple times into many languages – English, Dutch, French, Persian, German, Italian, Russian, Hindi, Urdu, and others – and has been published with commentary and notes. Scholars from England, the United States, France, Russia, India, Pakistan, Afghanistan, Turkey, Japan, and many other countries have emphasized "*Baburnama*"'s place among the immortal monuments of humanity. The fame of "*Baburnama*" is largely due to English Orientalists. The first complete edition (in English) was published in 1826 by J.Leyden and W.Erskine. Based on this, F.Talbot published abridged editions in 1878 and 1909. In 1921, English Orientalist A. Beveridge independently translated "*Baburnama*" from the original. In England alone, "*Baburnama*" has been published in translation nine times.

In recent years, the critical edition of "*Baburnama*" was published in the U.S. (Cambridge, Harvard University, 1993) by Professor W.Thackston, and in Japan (Kyoto, 1995-96) in two volumes with comprehensive glossaries, indexes, and commentaries. "*Baburnama*" was translated into Persian (1586), with excerpts rendered into Dutch by Vitsen (1705), into German in abridged form by A.Keyser (1828), and into French in full by Pavet de Courteille (1871). Translation and study of "*Baburnama*" also involved scholars from Afghanistan (Abdulkhay Habibi), Pakistan (Rashid Akhtar Nadvi, Shah Alam Mavliot), India (Mirza Nasruddin Haidar, Muhibbul Hasan Rizvi), Turkey (R.R.Arat, N.I.Bayur), among others. Russian Orientalists (N.I.Pantusov, S.I.Polyakov, V.Vyatkin) also translated excerpts, and N.I.Ilminsky published it in Kazan (1857).

A key common feature of Ibn Sina's and Babur's works is that both devoted attention to botanical terminology, producing their writings mainly in Arabic and Persian. Ibn Sina focused on plants in relation to their medicinal properties and their use in the treatment of diseases, whereas Muhammad Babur described plants in great detail—highlighting the regional variations in their names, as well as their flowers, leaves, and, when relevant, the taste of their fruits – thus presenting a synchronic analysis. Later, foreign scholars who translated these invaluable works examined them through both synchronic (the study of language at a specific point in time) and diachronic (the study of language across historical periods) perspectives in linguistics. For. ex:

Archaic, Arabic or Persian languages	Uzbek language	Latin or Old English	Modern English
<i>Harmal</i>	Isiriq	<i>Peganum</i>	Wild rue
<i>Safarjal/Hayva</i>	Behi	<i>Cydonia oblonga</i>	Quince
<i>Kuzbura [Ibn Sina. The Canon of Medicine]</i>	Kashnich	<i>Coriandrum</i>	Coriander (kashnich urug'i) (When the plant flowers and turns to seed, the aromatic, lightly floral seeds), Cilantro (barra kashnich), (the name for the serrated leaves and stems of the coriander plant) [https://www.southernliving.com/food/seasonings/coriander-vs-cilantro]
<i>Yabruh [Ibn Sina. The Canon of Medicine, Vol. 1, p. 210] / Yabruhus-sanam [Zahiriddin Muhammad Babur, "Baburnoma"]</i>	Mehrighiyoh	<i>Mandragora officinarum</i>	Mandrake
<i>Tin [Ibn Sina. The Canon of Medicine, Vol. 1, p. 274.] /Beyr [https://www.facebook.com/groups/246149995752425/posts/380455762321847/ "Baburnoma"]</i>	Anjir	<i>Ficus carica</i>	Fig

The table shows that in both English and Uzbek, plant names have lost their original ancient forms and have become archaic terms. The following section provides definitions of the botanical terms listed in the table, analyzed within a lexical-semantic

framework. For each term, its semantic domain, lexical evolution, and contextual usage are outlined.

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**COMPARATIVE ANALYSIS OF INFORMATION TECHNOLOGY TEXT
TRANSLATIONS BETWEEN ENGLISH AND UZBEK**

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Abstract. This study offers a comparative analysis of Information Technology (IT) text translation between English and Uzbek, focusing on direction-specific challenges and strategies in English-Uzbek (E-U) and Uzbek-English (U-E) workflows. Drawing on literature and illustrative examples, the paper shows that E-U translation is characterized by terminology non-equivalence, the need to coin or standardize neologisms, and extensive syntactic re-structuring to fit Uzbek's agglutinative morphology. Translators frequently combine borrowing, calque, and paraphrase, and engage in explicitation (e.g., unpacking compound noun phrases and clarifying acronyms) to maintain clarity and accessibility. In contrast, U-E translation benefits from a rich, standardized English technical lexicon but poses stylistic and idiomatic challenges, especially for translators working into an L2. Here, successful practice hinges on normalization and implicitation—condensing circumlocutory Uzbek descriptions into concise English technical terms (e.g., rendering *bulutga joylashtirish* as “cloud deployment”) – alongside rigorous terminological consistency. Across both directions, results underscore the centrality of domain knowledge, terminology management, and audience-aware choices. The discussion situates these findings within directionality research, arguing that with training and editorial workflows, high-quality output is attainable in both directions. The paper concludes with practical implications for translator training in term creation (E-U) and idiomatic polishing (U-E), highlighting how improved practices can enhance cross-lingual access to IT knowledge.

Keywords: English–Uzbek translation; IT terminology; directionality; explicitation and implicitation; term formation and standardization; idiomaticity; normalization; technical communication; bilingual lexicography; translation workflow.

INTRODUCTION. English and Uzbek represent two very different linguistic systems – English is an analytic Indo-European language with relatively fixed word order, whereas Uzbek is an agglutinative Turkic language with rich morphology and more flexible syntax. These fundamental differences pose significant challenges for translation of specialized texts, such as those in the domain of information technology

(IT). Notably, many modern IT terms originated in English and often lack established equivalents in Uzbek. For example, early on terms like “software,” “cloud computing,” and “smartphone” had no standardized Uzbek counterparts, requiring translators to either adopt transliterations (e.g. *smartfon* for “smartphone”) or coin new phrases (e.g. *aqlli telefon*, literally “smart telephone”) to convey the meaning [1, p. 177–178]. Conversely, when translating from Uzbek into English, the target language already dominates the IT domain, but translators face the task of producing idiomatic English text, often working from Uzbek originals that may use descriptive phrasing instead of technical terminology. Complicating matters, many translation projects involve inverse translation – translating into a non-native language. Traditionally, translation theorists maintained that translators should work only into their first language (L1) for optimal quality, viewing translation into a second language (L2) as inherently prone to error [2, p. 1–2]. This prescriptive view is reflected in industry practice where agencies often advertise “native translator” guarantees. However, in settings like Uzbekistan, practical necessity dictates that many professionals must translate both from English to Uzbek and from Uzbek to English, due to the relative scarcity of native English translators with advanced Uzbek skills. Recent research suggests that professional translators can achieve high-quality results in both directions. For instance, Hunziker Heeb (2016) found no substantial differences in the self-concepts or general approaches of translators working into L1 versus L2, indicating that with sufficient training and experience, L2 translation can be performed at a professional standard [3, p. 84]. In this context, a systematic comparison of English–Uzbek vs. Uzbek–English IT translation is valuable for identifying direction-specific challenges and effective strategies.

Aim of the study: Building on the above insights, this study aims to compare the linguistic and technical issues that arise in translating IT texts between English and Uzbek in both directions. We investigate how translators handle terminological gaps, structural differences, and stylistic requirements when going from English to Uzbek (E→U) versus from Uzbek to English (U→E). By highlighting the distinct hurdles and techniques in each case, the study seeks to inform best practices for translators and contribute to translation studies on lesser-studied language pairs like English–Uzbek.

METHODS. This research employed a comparative qualitative analysis of English–Uzbek IT translations in both directions. The analysis combined a review of relevant literature with examination of actual translation examples drawn from technical texts and translator practice. First, we gathered a sample of IT-related source texts and their translations: for English-to-Uzbek, sources included software documentation, technical

manuals, and computing glossaries; for Uzbek-to-English, sources included Uzbek-authored IT articles and user guides. We also consulted established bilingual terminology resources (for example, an English–Uzbek computing glossary by Khakimov) to identify official equivalents or prevalent translations of technical terms. Each sample translation was analyzed to determine how key challenges were addressed. In particular, we focused on: (1) Terminology equivalence – how translators dealt with English IT terms lacking Uzbek equivalents and vice versa; (2) Syntactic adjustments – how English nominal compounds or other structures were transformed to fit Uzbek grammar, and how Uzbek grammatical constructions were rendered into fluent English; and (3) Pragmatic and stylistic choices – such as handling of culture-specific references, tone, and formality in the two languages.

We categorized the translation strategies observed in the corpus using standard terminology from translation studies. Key strategies for lexical gaps included borrowing (direct use of the source term), calque or literal translation, and paraphrasing the concept in the target language. For structural issues, we noted instances of sentence restructuring, addition of explanatory phrases, or omission of redundant elements. To supplement the textual analysis, we drew on findings from prior studies of English–Uzbek translation. In particular, Aripova’s recent study on technical neologisms [1] provided insights into common issues and solutions in English-to-Uzbek translation, while research on translation directionality (e.g. Campbell 1998; Hunziker Heeb 2016) informed our understanding of how working into L2 might affect the translation process. Throughout the analysis, we ensured that any use of Uzbek terms in our examples was accompanied by an English gloss or explanation for clarity. The outcome of this methodology is a set of comparative observations on E→U and U→E translation challenges, supported by concrete examples from the data.

RESULTS. English-to-Uzbek Translation: The translation of IT texts from English into Uzbek revealed several prominent challenges. A primary issue is terminology non-equivalence. As noted, many technical terms in English do not have pre-existing one-word counterparts in Uzbek [1, p. 177–178]. Translators therefore resort to a range of solutions. One common approach is borrowing the English term, either by inserting it in the Latin script or adapting it to Uzbek phonology. For instance, “database” is often rendered as *bazavoy ma’lumotlar* or simply *database* in Uzbek texts, and *kompyuter*, *printer*, *skanner* (computer, printer, scanner) are routinely used as direct loans in Uzbek IT discourse. In other cases, translators create neologisms or calques. For example, “cloud computing” has been translated literally as *bulutli hisoblash texnologiyalari* (literally, “cloud computing technologies”), aligning with Uzbek morphological

patterns, though in practice some translations still prefer to retain the English term *cloud computing* for familiarity. Similarly, “smartphone” entered Uzbek as *smartfon* (a straightforward transliteration), while linguistic purists have proposed the calque *aqlli telefon* (“smart telephone”) as a more transparent alternative [1, p. 178]. Each option has implications: using the English loanword can improve precision and international comprehensibility, whereas a calque or descriptive term can make the concept more accessible to Uzbek speakers unfamiliar with the English term. We observed that paraphrase is another frequently used strategy to handle missing equivalents. Instead of a one-to-one translation, translators often explain the meaning of a term in Uzbek words. Indeed, analysis of our corpus indicates that paraphrasing using unrelated words or definitions was one of the most frequent methods for conveying the sense of novel English terms. For example, the English word “hotspot” (in networking context) might be translated as *simsiz internet nuqtasi*, literally “wireless internet point,” fully describing the function of a hotspot rather than attempting a direct lexical substitute. This strategy ensures comprehension at the expense of brevity. Its prevalence underscores the translators’ adaptive role in expanding Uzbek scientific vocabulary by explanation.

Beyond terminology, syntactic and grammatical adjustments are crucial in E→U translation. English technical texts often feature complex noun phrases and compound terms (e.g. “access point configuration settings”) that do not map neatly onto Uzbek structure. Uzbek generally requires such compounds to be unpacked and reorganized according to its modifier–head ordering and agglutinative suffixation. Our analysis confirms that translators frequently reorder components and add linking words to achieve a natural Uzbek sentence. As Aripova (2025) highlights, an English multi-word term may need significant restructuring to convey the meaning in Uzbek [1, p. 178]. For instance, a phrase like “peer-to-peer network” cannot be translated word-for-word in the original English sequence; instead, an Uzbek translator might render it as *tenglar o‘rtasidagi tarmoq*, which literally means “network among equals.” Here, the English compound “peer-to-peer” is expressed by introducing the relational phrase *o‘rtasidagi* (“among”) and changing the word order, illustrating explicitation – spelling out the relationship that English leaves implicit. Without such adjustments, a direct translation would sound unnatural or be confusing in Uzbek. We also observed translators adding clarifying words for technical acronyms or shorthand. For example, “RAM usage” might be translated with an explanatory phrase as *tezkor xotira foydalanilishi* (literally “operational memory usage”), since simply transliterating “RAM” may not communicate meaning to all readers. These findings align with known

differences in English and Uzbek grammar: what English packs into compact noun clusters, Uzbek often needs to unpack into longer constructions or clauses.

Effective handling of terminology and syntax in E→U translation often involves a mix of strategies. Consider the following example illustrating different approaches:

- *Source (English):* “The software update failed due to a network authentication error.”

- *Translation 1 (Uzbek):* *Dasturiy yangilanish tarmoq autentifikatsiyasi xatosi tufayli muvaffaqiyatsiz tugadi.*

(Back-translation: “The software update ended unsuccessfully due to a network authentication error.”)

- *Translation 2 (Uzbek):* *Tarmoqni tekshirish (autentifikatsiya) xatosi tufayli dastur yangilanishi o‘tmedi.*

(Back-translation: “Due to a network verification (authentication) error, the program update did not go through.”)

Both Uzbek versions convey the overall meaning, but their strategies differ. Translation 1 closely mirrors the English technical terms: *dasturiy yangilanish* is a calque for “software update” (using *dasturiy* “pertaining to software” + *yangilanish* “update”), and *autentifikatsiya* is a direct loan for “authentication.” The sentence structure is adjusted for Uzbek, but the terminology remains concise and borrowed (*autentifikatsiya* being an assimilated technical term). In contrast, Translation 2 opts to explain the term “authentication” by the phrase *tarmoqni tekshirish* (“network verification”) and places the English term in parentheses as a gloss. This version also slightly reorders the sentence for clarity (putting the cause at the beginning) and uses a more idiomatic expression *o‘tmedi* (“did not go through”) to describe the failure, instead of a direct translation of “failed.” The first translation is more compact and would appeal to readers with IT background who are comfortable with loanwords, whereas the second translation is more verbose but potentially clearer to lay readers. Such examples illustrate the translator’s decision-making: when faced with a term like “authentication” that might be unfamiliar in Uzbek, they must choose between brevity (using the loanword) and clarity (providing an explanation). Our corpus showed translators sometimes using a hybrid approach – e.g., introducing a new term with an explanation on first occurrence (“*ma’lumotlar bazasi (database)*”) to both educate the reader and maintain precision.

Another subtle challenge in E→U translation involves cultural and connotative nuances. While IT content is largely technical, some English terms carry connotations that might not directly transfer to Uzbek. A case in point is the word “hacker.” In

English, “hacker” often has a negative connotation (implying an illicit or skilled malicious intruder), whereas a direct transliteration *xaker* in Uzbek might be interpreted more neutrally as simply an expert or someone proficient with computers. If an English text refers to “hackers” in a security context, an uninformed Uzbek reader might not grasp the negative intent. To bridge this gap, translators may add qualifiers in Uzbek. For example, *xavfli xaker* (“malicious/dangerous hacker”) can be used to explicitly convey the negative aspect [1, p. 178]. This adjustment ensures the pragmatic meaning – the intended impression of the term – is preserved, not just the basic referential meaning. Overall, translating from English to Uzbek requires not only converting technical content but also localizing it: adapting new terms into the Uzbek lexicon, clarifying implicit meanings, and making the text accessible for the target audience’s linguistic and cultural context.

Uzbek-to-English Translation: Translating IT texts from Uzbek into English presented a somewhat different profile of challenges. On one hand, English as a target language offers a rich, standardized technical vocabulary, meaning there is usually an established equivalent for any given concept. Indeed, many technical terms used in Uzbek IT materials turn out to be borrowings or calques from English in the first place (often introduced via Russian). In our dataset, we found numerous instances where the Uzbek source term was essentially derived from English, which simplified the translator’s job. For example, Uzbek sentences discussing *dasturiy ta’minot* readily map to “software,” *sun’iy intellekt* to “artificial intelligence,” and *kompyuter tarmog’i* to “computer network” with a one-to-one correspondence. In cases where Uzbek IT writers have diligently used standardized terminology, the translation process can be almost straightforward substitution. Glossaries and technical dictionaries are valuable here: a translator cross-referencing *ma’lumotlar bazasi* will quickly confirm it should be translated as “database,” and so on. The primary task becomes ensuring consistency and choosing the preferred English term among possible synonyms. Resources such as bilingual IT dictionaries (e.g., Khakimov’s English–Uzbek glossary) help verify that terms like *ilova* are rendered as “application” (or “app”) and *bildirishnoma* as “notification,” matching industry usage.

However, Uzbek-to-English translation is not always trivial. One significant challenge arises when the Uzbek source uses an explanatory or circumlocutory expression in place of a concise technical term. This often happens if the English term was not widely known in Uzbek at the time of writing, or if the author intentionally avoided foreign borrowings. As a result, the translator must interpret the description and infer the standard English term that encapsulates that meaning. For example, an Uzbek text

might say *dasturiy vositalarning bulutga joylashtirilishi* – literally, “the placement of software tools onto the cloud.” A direct, literal translation of this phrase into English would be clunky and non-standard. The challenge for the translator is to recognize that this phrase describes the concept of “cloud deployment.” The appropriate English rendition would thus be: “the software tools were deployed to the cloud,” or simply using the noun form “cloud deployment,” rather than a wordy literal translation. In doing so, the translator performs an implicitation, replacing an explicit descriptive phrase with the concise technical term expected in English. Our analysis noted this pattern frequently: where an English-to-Uzbek translator might have to add words to explain a term, the Uzbek-to-English translator often has to condense or substitute a definitive term for a drawn-out description. This flip in approach is essentially an inversion of the E→U scenario. It requires the translator to have a solid grasp of the underlying concept so that nothing is lost in translation except unnecessary verbosity. In the above example, introducing the term “deployment” in the English translation actually elevates the technical register and aligns with English technical style, provided the context supports that interpretation. Such shifts from explicit to implicit correspondences are acceptable and even expected as long as the meaning is accurately conveyed and the resulting English text reads naturally to the target audience.

Another challenge in U→E translation relates to style and idiomaticity. Because of the translator demographics, many Uzbek-to-English technical translations are produced by translators for whom English is a second language (L2). The source comprehension may be strong (since they are often native Uzbek speakers fully understanding the original), but producing polished technical English can be demanding. A common symptom we observed is translations that are literal and grammatically correct, yet subtly non-idiomatic to a native reader. For instance, consider the Uzbek sentence “*dastur yangilanishi muvaffaqiyatsiz yakunlandi.*” A word-for-word translation would be “*The program update finished unsuccessfully.*” While not incorrect, this phrasing is not the way a native English IT professional would typically describe the situation. A more natural English rendition is “*The software update failed.*” The literal translation (*finished unsuccessfully*) reflects Uzbek phrasing and echoes the source structure, but it lacks the concise idiomatic punch of the English expression *to fail*. Such differences in collocation and style are often only evident to a native or near-native ear. Our findings are in line with the general concern that L2 translations may exhibit slight awkwardness or overly formal tone. In professional practice, therefore, Uzbek-to-English IT translations often undergo careful editing by native English editors or advanced bilingual specialists to polish the text. This extra revision step helps

catch unnatural phrasing, adjust word choice (e.g., preferring “failed” over “finished unsuccessfully”), and ensure the tone meets the expectations of English technical documentation (which tends to prioritize clarity and brevity). It is worth noting, however, that many Uzbek translators with strong command of English can and do produce high-quality translations. As they gain experience, especially by working with parallel texts and industry standards, they internalize the typical English idioms and preferred terminology. For example, an experienced translator will know to translate *yomon dastur* as “malware” rather than a literal “bad program,” and *draiver* (a loanword for driver software) simply as “driver.” Mastery of such terminology, often aided by consulting large English corpora or translation memory systems, allows L2 translators to approach near-native fluency in specialized contexts.

Cultural and contextual adaptation is generally less problematic in U→E translation because the content of IT texts is fairly universal. Yet, there are instances where local flavor must be handled. If an Uzbek text uses a culturally specific metaphor or anecdote, the translator must decide whether to retain it or replace it. For example, an Uzbek cybersecurity guide might describe a pristine data environment with a local proverb like “*ilon izi qolmagan joy*,” literally “a place untouched even by a snake’s trail.” While vivid in Uzbek, this phrase would likely confuse an international English audience if translated literally. The translator in this case would opt for a neutral description such as “a completely untouched section of data,” sacrificing the colorful metaphor for a clear technical description. Such choices align with English technical writing conventions that favor directness over figurative language. Overall, the U→E direction benefits from the wealth of established terminology and a conventionally direct style in English, but it challenges the translator to produce a text that does not read like a translation. Achieving this often involves normalization – rendering the content in the form an English reader expects, even if it means reordering information or using an English technical term in place of an explicative source phrase. Consistency is also paramount: if an Uzbek text uses a term consistently, the translator should likewise use a single English equivalent consistently. For example, if *zaxira nusxa* appears repeatedly in the source, it should be translated uniformly as “backup” (or “backup copy”) each time, rather than fluctuating between synonyms. Likewise, an Uzbek term like *ilova* should not be translated as “app” in one sentence and “application” in another without good reason – a single choice should be made to avoid confusion. Our observations underscore that U→E translators must perform nuanced tasks: interpret the sometimes implicit or verbose source material, find the correct

technical terms in English, and craft a fluent narrative that reads as if originally written in English.

DISCUSSION. The comparative results demonstrate a clear asymmetry between the two translation directions, with each posing almost inverse problems. This confirms a long-recognized notion in translation studies: translating into a less technologically developed or resource-rich language (English→Uzbek) often demands *expansion* and *explicitation*, whereas translating into a globally dominant language (Uzbek→English) involves *condensation* and *conventionalization*. In essence, the difficulties are the mirror image of each other. Campbell's inverse translation model articulated this duality: when working from an L2 into one's native L1, the greater challenge lies in fully understanding and decoding the source text, while expression in the mother tongue is relatively easier; conversely, when working into an L2, comprehending the source is straightforward, but producing a natural target text is the hard part [2, p. 57]. Our findings align with this model. In E→U translation, translators struggle primarily with comprehension-equivalence issues – figuring out or inventing terms for unfamiliar concepts and making the text make sense in Uzbek. In U→E translation, understanding the source is usually direct (especially since many terms are borrowed), but the effort shifts to crafting an idiomatic and precise English rendition.

Despite these contrasting challenges, our analysis also highlights several common principles that hold true in both directions. One is the critical importance of terminological consistency and accuracy. Regardless of direction, a high-quality translation ensures that each technical term is translated the same way throughout the text and in accordance with any existing standards or glossaries. Inconsistencies (e.g., translating the same Uzbek term *ilova* as “application” in one place and “attachment” in another, or an English term like “server” alternately as *server* and *qabul qiluvchi*) can confuse the reader and undermine the professional tone. Both directions benefit greatly from the use of terminology management tools and reference materials to keep terminology uniform. Another shared aspect is the need for domain knowledge and research. The translator must often go beyond linguistic knowledge to understand the underlying technical concepts in order to translate them appropriately. This is where the translator effectively takes on the role of a terminologist. As Bowker (2002) observed, effective technical translators behave like terminologists – they devote effort to researching and memorizing the specialized lexicon of their field so that they can retrieve and apply the correct terms in the target language [4, p. 78]. Our study illustrates this point: whether it's coining a new word in Uzbek or choosing the exact right term in English, the translator's familiarity with IT terminology (and how new

terms are being used or standardized) directly impacts the translation quality. In practice, translators on both sides increasingly consult parallel texts, technical dictionaries, and even software localization guides (such as Microsoft's glossary) to validate their choices. This terminological diligence ensures that translations are not only internally consistent but also externally consistent with industry norms.

The differences in direction also carry practical implications for training and workflow. For English-to-Uzbek, translators and editors might prioritize developing new terminology and establishing clarity for the reader. This could involve collaboration with subject matter experts or terminologists to decide on translations for emerging terms (for example, agreeing whether *bulut* (cloud) concepts should be translated or left in English). It also involves sensitivity to the target readership – gauging when a loanword is acceptable or when an explanation is necessary. For Uzbek-to-English, additional emphasis should be placed on polishing language fluency. It is advisable for important Uzbek→English translations to be reviewed by a native English speaker or a bilingual editor with native proficiency, as an extra quality control step to catch any unnatural phrasing. This two-step approach (translation by a bilingual expert, followed by monolingual editing) can significantly enhance the readability of the final English text. At the same time, the trend noted by Hunziker Heeb – that many professionals can translate into L2 effectively [3, p. 84] – suggests that rigid native-only policies might be relaxed if translators receive proper training. Training programs for Uzbek translators should include modules on English technical writing style, common collocations, and frequent error patterns in L2 translation, thereby equipping translators to self-edit and approach native-like quality. Likewise, training for E→U translation should cover methods of term creation (drawing from linguistics and existing Uzbek word formation rules) and practice in restructuring English sentences into natural Uzbek forms.

Finally, the evolving nature of the IT field means that new challenges continually emerge in both directions. As technology advances, new English terminology enters usage (e.g. “cryptocurrency,” “Internet of Things”) which may not yet have Uzbek equivalents. Translators working E→U will continuously perform the balancing act of introducing such terms into Uzbek, whether through loans or inventive translations. Simultaneously, as Uzbek develops its scientific register, there may be instances where Uzbek technical discourse innovates or prefers certain expressions that are not direct copies of English. Future translators working U→E will need to stay attuned to the nuances of Uzbek tech language to accurately reflect them in English without loss of meaning. In both cases, the translator's role is not merely to replace words but to

mediate between languages and cultures, ensuring that the intent and technical content survive the journey between English and Uzbek. The comparative perspective in this study reinforces that successful translation is a complex decision-making process. Each direction has its unique mix of *linguistic*, *terminological*, and *cultural* adjustments, yet both ultimately strive for the same end: a text that conveys the original information accurately and readably for its intended audience.

CONCLUSION. In summary, translating IT texts between English and Uzbek is a bidirectional challenge characterized by complementary difficulties. Translation from English into Uzbek requires the translator to expand and explain: due to lexical gaps, one must often invent or adapt terminology and restructure English sentences to fit Uzbek's grammatical mold. The translator serves as a pioneer, enriching the Uzbek technical lexicon while making the text understandable for local readers. In contrast, translation from Uzbek into English demands condensation and refinement: the translator must render verbose descriptions into precise English technical terms and ensure the result reads idiomatically, often working outside their native language. Despite these differences, both directions benefit from rigorous terminology management, deep understanding of the subject matter, and careful attention to audience expectations. Consistency in term usage and clarity of expression are key indicators of quality in either direction. This comparative analysis has shown that rather than one direction being categorically "easier," each has its own set of hurdles that require different skills and strategies. By recognizing these specific needs, translators can better prepare themselves – for example, by developing creative term-coining skills for English-to-Uzbek work and honing their stylistic fluency for Uzbek-to-English tasks. As English–Uzbek translation activity grows (spurred by globalization and technological development in Uzbekistan), the insights from this study can inform translator training and practice. Ultimately, improving the quality of translations in both directions will facilitate more effective knowledge exchange and accessibility of IT content across the English and Uzbek languages. The English–Uzbek case also illustrates a broader point in translation studies: successful translation is not merely about linguistic conversion, but about problem-solving and adaptation to bridge differences between languages, technical domains, and cultures.

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СЕМАНТИЧЕСКИЙ АСПЕКТ ИНТЕРНЕТ-МЕМОВ

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Аннотация

В статье рассматриваются интернет-мемы как феномен современной коммуникации. Особое внимание уделяется их семантической природе: анализируются уровни значения, механизмы семантической игры, роль интертекстуальности, культурного контекста и прагматики. Теоретическая часть опирается на семиотику, когнитивную лингвистику и прагмалингвистику. В качестве примеров анализируются наиболее известные мемы («Ждун», «Doge», «This is fine», «Grumpy Cat», «Кот Шлёпа»).

Ключевые слова: интернет-мем, интернет-дискурс, семиотика, семиосфера, игровая функция, ирония, пародия.

Интернет-мемы — один из самых ярких и популярных феноменов современной цифровой культуры. Они представляют собой поликодовые тексты, в которых вербальные и визуальные элементы формируют сложное многослойное значение. Мемы активно функционируют в интернет-дискурсе, где они выполняют не только развлекательные, но и социальные, политические, идентификационные функции.

С точки зрения семантики мемы особенно интересны, так как они демонстрируют процессы формирования смысла в условиях быстрой коммуникации, где значение рождается на пересечении текста, изображения и культурного контекста.

Термин «мем» был введён Р. Докинзом в книге «Эгоистичный ген» (1976), где он определялся как «единица культурной информации, распространяемая путём подражания». В интернет-среде это понятие получило новую жизнь: мемы стали рассматриваться как визуально-текстовые единицы, распространяющиеся в цифровом пространстве.

Мем как знак в семиотике. Семиотика даёт важный инструментарий для анализа мемов. Согласно Ч. Пирсу, знаки делятся на иконы (подобие), индексы (причинная связь) и символы (условное значение). Мем соединяет все три типа: картинка (икон), намёк на ситуацию (индекс), надпись или культурная ассоциация (символ). Ф. де Соссюр понимал знак как единство означающего и

означаемого. В меме это соотношение часто подвергается ироническому сдвигу: изображение и текст могут вступать в противоречие, создавая комический эффект.

С точки зрения когнитивной лингвистики мем можно рассматривать как фрейм, активирующий определённый сценарий интерпретации. Например, мем «Ждун» запускает сценарий «ожидания», который встраивается в разные коммуникативные ситуации. В прагмалингвистике (Дж. Остин, Дж. Серль) мем выступает как речевой акт: его публикация не только «передаёт картинку», но и совершает действие — высмеивает, выражает протест, объединяет «своих». Мемы являются разновидностью поликодового текста, где сочетаются визуальные и вербальные элементы. Их интертекстуальная природа (Ю. Кристева, М. Бахтин) предполагает отсылку к «чужим текстам» — фильмам, книгам, новостям. Именно это делает мем узнаваемым и многозначным.

Ю. М. Лотман рассматривал культуру как «семиосферу», пространство взаимодействия знаковых систем. Интернет-мемы можно рассматривать как микроэлементы семиосферы, быстро циркулирующие и перетолковывающиеся в пределах цифровой среды.

Семантика мема многослойна и включает:

- 1) Денотативный уровень — буквальное изображение.
- 2) Конотативный уровень — ассоциативные и культурные смыслы.
- 3) Прагматический уровень — коммуникативный эффект. Пример: мем «This is fine». — Денотативно: собака сидит в горящем доме. — Конотативно: ситуация катастрофы, апатия. — Прагматически: ироничный комментарий к кризисам.

Мемы выполняя игровую функцию имеют следующие механизмы:

- 1) Ирония и пародия: мемы высмеивают шаблонные ситуации (например, «Grumpy Cat» — символ вечного недовольства).
- 2) Полисемия: одно изображение используется в десятках контекстов («Doge» — милый, абсурдный, ироничный одновременно).
- 3) Семантическая компрессия: сложные смыслы выражаются в минимальной форме («Ждун» — вся бюрократия в одном образе).
- 4) Интертекстуальные отсылки: мемы заимствуют кадры из фильмов, сериалов, новостей («Леонардо ДиКаприо с бокалом»).

Мемы обладают контекстуальной вариативностью значений. Одно и то же изображение может интерпретироваться по-разному: — «Ждун» в бытовом чате — «жду ответа».

— В политическом посте — «жду реформ».

— В юмористическом паблике — «жду зарплату».

Таким образом, семантика мема динамична и контекстуальна.

Мемы не только смешат, но и конструируют идентичность:

— «Шлёпа» — символ интернет-абсурда.

— «This is fine» — знак политического пессимизма.

— Локальные мемы (узбекские, русские, японские) — отражают культурные особенности.

Предлагаем рассмотреть анализ конкретных кейсов.

«Ждун». Денотативно: скульптура фантастического существа.

Конотативно: ожидание, скука. Прагматически: выражение сарказма по поводу бюрократии.

«Doge». Денотативно: собака породы сиба-ину.

Конотативно: милый абсурд. Прагматически: игровая ирония, интернет-сленг.

«This is fine». Денотативно: собака сидит в огне.

Конотативно: равнодушие к катастрофе. Прагматически: критика апатии, выражение самоиронии.

«Grumpy Cat». Денотативно: кот с недовольным выражением морды.

Конотативно: скепсис, пессимизм.

Прагматически: замена длинного комментария одной картинкой.

«Шлёпа». Денотативно: большой кот-каравал. Конотативно: интернет-абсурд.

Прагматически: маркер принадлежности к определённым сообществам.

Семантический анализ интернет-мемов показывает, что они представляют собой многослойные знаковые образования, значение которых формируется на пересечении изображения, текста и культурного контекста. Мемы совмещают в себе элементы иконического, индексального и символического знака, что делает их особенно продуктивными для коммуникации.

Будучи поликодовыми текстами, мемы обладают высокой степенью интертекстуальности и прагматической силы: они позволяют выразить сложные идеи, эмоции и социальные позиции в сжатой форме. Динамика их семантики отражает изменчивость интернет-дискурса и особенности социокультурной среды.

Таким образом, интернет-мемы выступают важным инструментом смыслопорождения и социального взаимодействия в цифровую эпоху. Их дальнейшее изучение открывает перспективы для более глубокого понимания механизмов семантики и дискурсивных практик современного общества.

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ВЗАИМОСВЯЗЬ ПРЕДСТАВЛЕНИЙ МИГРАНТОВ ИЗ УЗБЕКИСТАНА О СВОЕМ ЭТНОСЕ И СТЕПЕНИ ИХ АДАПТАЦИИ В РОССИИ

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Миграционные процессы в современном глобальном мире актуализируют проблему социально-психологической адаптации мигрантов в принимающем обществе. Особую значимость приобретает изучение психологических механизмов, опосредующих этот процесс, в частности, роль этнической идентичности и представлений о своей этнической группе. Данная работа направлена на теоретическое осмысление характера взаимосвязи между представлениями мигрантов из Узбекистана о своем этносе и уровнем их адаптации в российском социокультурном пространстве.

В современной научной литературе социально-психологическая адаптация мигрантов рассматривается как сложный, многогранный процесс, включающий психологические, социальные и культурные аспекты вхождения индивида в новую среду [2]. Согласно теории аккультурации Дж. Берри, мигранты выбирают одну из четырех стратегий адаптации — ассимиляцию, сепарацию, маргинализацию или интеграцию — в зависимости от стремления к сохранению культурной идентичности и ориентации на активное взаимодействие с представителями принимающего общества [1].

Этническая идентичность, как значимый компонент самосознания личности, выступает одним из центральных психологических механизмов, опосредующих процесс адаптации. В работах Т.Г. Стефаненко этническая идентичность определяется как «психологическая категория, которая относится к осознанию своей принадлежности к определенной этнической общности» [4]. Она включает в себя когнитивный (знания, представления об особенностях своей группы) и аффективный (чувство принадлежности к группе) компоненты.

Представления мигрантов о своем этносе формируют основу их этнической идентичности и могут оказывать существенное влияние на выбор стратегии аккультурации. Согласно концепции Г.У. Солдатовой, позитивная этническая идентичность характеризуется сочетанием позитивного отношения к собственному народу с позитивным отношением к другим этническим группам, что создает оптимальный баланс толерантности по отношению к собственной и другим этническим группам [3].

В рамках культурно-исторического подхода Л.С. Выготского и деятельностного подхода А.Н. Леонтьева психологические процессы рассматриваются в их обусловленности социокультурным контекстом [5]. С этой точки зрения, представления мигрантов о своем этносе формируются в результате интериоризации культурных знаков и символов в процессе социализации и могут трансформироваться под влиянием новой социокультурной среды.

Теоретический анализ позволяет предположить несколько возможных механизмов влияния представлений мигрантов о своем этносе на процесс адаптации:

1. Позитивные представления о своем этносе могут выступать в качестве ресурса психологической поддержки, обеспечивая сохранение чувства преемственности и личностной целостности в условиях социокультурных изменений.

2. Знание истории и культуры своего народа может способствовать формированию более гибкой идентичности, позволяющей интегрировать новый культурный опыт без потери базовых ценностных ориентиров.

3. Сбалансированность когнитивного и аффективного компонентов этнической идентичности может способствовать выбору интеграционной стратегии аккультурации, которая связана с наиболее благоприятными показателями психологической адаптации.

Особый интерес представляет концепция культурного интеллекта К. Эрли и С. Анга, который определяется как способность индивида эффективно функционировать в ситуациях, характеризующихся культурным разнообразием [6]. Культурный интеллект включает метакогнитивный, когнитивный, мотивационный и поведенческий компоненты и может выступать медиатором в отношениях между этнической идентичностью и адаптацией.

Таким образом, теоретический анализ проблемы позволяет выдвинуть гипотезу о том, что характер представлений мигрантов-узбеков о своем этносе связан с уровнем их адаптации в России. При этом можно предположить, что наиболее благоприятными для адаптации являются позитивные представления о своем этносе в сочетании с открытостью к принимающей культуре, что соответствует интеграционной стратегии аккультурации.

Перспективы эмпирического исследования данной проблемы связаны с разработкой методического инструментария, позволяющего дифференцированно оценивать различные аспекты представлений мигрантов о своем этносе и их взаимосвязь с показателями социально-психологической адаптации. Предполагается использование как авторских методик, так и стандартизированных опросников для комплексной оценки исследуемых феноменов.

Практическая значимость разрабатываемой проблематики заключается в возможности использования полученных данных для разработки эффективных программ психологической поддержки мигрантов, направленных на формирование конструктивных стратегий адаптации при сохранении позитивной этнической идентичности. Кроме того, результаты исследования могут быть использованы для совершенствования государственной миграционной политики и развития межкультурного диалога.

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**DIGITALIZATION AND LEGISLATIVE SUPPORT IN INTELLECTUAL PROPERTY
PROTECTION FOR FODDER ADDITIVE PRODUCTION TECHNOLOGIES**

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ABSTRACT

The article is devoted to the analysis of digitalization and legislative support for the protection of intellectual property in the field of feed additive production technologies. It examines current trends in innovative development in animal husbandry, including microencapsulation, the use of plant extracts, and biocatalytic processes, as well as the legal aspects of protecting such technologies. Particular attention is paid to recent reforms in Uzbekistan aimed at simplifying procedures for registering intellectual property objects, introducing digital tools (QR certificates, electronic patent systems), and strengthening liability for violations. The paper offers recommendations for further improvement of the legal framework: digitalization of patent procedures, development of judicial practice, creation of support programs for researchers, and enhancement of legal awareness in the field of intellectual property. It is concluded that effective protection of innovations in the feed additive sector is possible only through the integration of modern digital technologies with stable and coherent legal regulation.

Keywords: intellectual property, digitalization, feed additives, innovative technologies, patent law, trade secret, legislation of Uzbekistan, technological protection, microencapsulation, legal protection.

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ЦИФРОВИЗАЦИЯ И ЗАКОНОДАТЕЛЬНОЕ ОБЕСПЕЧЕНИЕ ЗАЩИТЫ ИНТЕЛЛЕКТУАЛЬНОЙ СОБСТВЕННОСТИ НА ТЕХНОЛОГИИ ПРОИЗВОДСТВА КОРМОВЫХ ДОБАВОК

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АННОТАЦИЯ

Статья посвящена анализу вопросов цифровизации и законодательного обеспечения охраны интеллектуальной собственности в сфере технологий производства кормовых добавок. Рассмотрены современные тенденции инновационного развития в животноводстве, включая микрокапсулирование, использование растительных экстрактов и биокаталитических процессов, а также правовые аспекты защиты таких технологий. Особое внимание уделено реформам в Узбекистане по упрощению процедур регистрации объектов интеллектуальной собственности, внедрению цифровых инструментов (QR-сертификаты, электронные патентные системы) и усилению ответственности за нарушения. В работе предложены рекомендации по дальнейшему совершенствованию правовой базы: цифровизация патентных процедур, развитие судебной практики, создание программ поддержки исследователей и повышение правовой культуры в области интеллектуальной собственности. Сделан вывод, что эффективная защита инноваций в сфере кормовых добавок возможна только при сочетании современных цифровых технологий и устойчивого правового регулирования.

Ключевые слова: интеллектуальная собственность, цифровизация, кормовые добавки, инновационные технологии, патентное право, коммерческая тайна, законодательство Узбекистана, технологическая защита, микрокапсулирование, правовая охрана.

ВВЕДЕНИЕ

Современное развитие аграрного сектора Республики Узбекистан характеризуется активным внедрением инновационных и цифровых технологий, направленных на повышение производительности животноводства и обеспечение продовольственной безопасности страны. Особое значение в этом процессе приобретают технологии производства кормовых добавок, которые способствуют улучшению усвояемости кормов, повышению качества животного питания и устойчивости к стрессовым факторам. Однако технологическая сложность и высокая научная ценность таких разработок требуют надёжной правовой защиты результатов интеллектуальной деятельности, обеспечивающей баланс между интересами изобретателей, производителей и государства [1].

В условиях глобальной цифровизации традиционные механизмы охраны интеллектуальной собственности утрачивают эффективность, что требует внедрения новых подходов, основанных на использовании цифровых инструментов — электронных платформ регистрации, патентных баз данных, систем отслеживания с применением QR-кодов и блокчейн-технологий. В Узбекистане в последние годы реализуется масштабная программа реформ в сфере интеллектуальной собственности: упрощены процедуры подачи и

рассмотрения заявок, внедрены цифровые сертификаты, усилена административная и уголовная ответственность за нарушение исключительных прав [2; 3]. Эти изменения отражают стремление государства к гармонизации национального законодательства с международными стандартами, включая положения Соглашения ТРИПС и рекомендаций ВОИС [4].

Производство кормовых добавок как отрасль высоких технологий имеет особую специфику правовой защиты: здесь важно учитывать не только патентоспособность химических составов и способов производства, но и сохранение конфиденциальной информации, рецептов, условий инкапсулирования и методов биокатализа. Недостаточная цифровизация процессов патентования и контроля создаёт риски неправомерного использования технологий, подделок и трансграничных нарушений, что негативно сказывается на инвестиционном климате и конкурентоспособности национальных производителей [5].

Таким образом, исследование цифровизации и законодательного обеспечения защиты интеллектуальной собственности в сфере технологий производства кормовых добавок в Узбекистане имеет стратегическое значение. Оно направлено на выявление тенденций цифровой трансформации, оценку эффективности действующих правовых механизмов и выработку предложений по созданию современной системы защиты технологических инноваций, способной обеспечить устойчивое развитие аграрной науки и промышленности в условиях цифровой экономики [6].

Методы исследования

В рамках данного исследования применялись комплексные методы правового, сравнительного и системного анализа, направленные на выявление особенностей цифровизации и законодательного регулирования в сфере охраны интеллектуальной собственности, применительно к технологиям производства кормовых добавок в Республике Узбекистан. Полученные результаты основаны на **системном подходе**, который позволил комплексно рассмотреть правовые, организационные и технологические аспекты охраны интеллектуальной собственности в условиях цифровой трансформации аграрного сектора Узбекистана.

Результаты

Результаты проведённого исследования показывают, что цифровизация процедур охраны интеллектуальной собственности в Узбекистане уже оказывает значительное влияние на развитие инновационной среды в агропромышленном комплексе, включая производство кормовых добавок. Анализ действующего законодательства и внедряемых цифровых инструментов выявил несколько ключевых тенденций, формирующих устойчивую правовую экосистему для защиты технологических разработок.

Во-первых, упрощение процедур регистрации изобретений и промышленных образцов, реализованное через платформу Агентства интеллектуальной собственности при Министерстве юстиции Республики Узбекистан, позволило значительно сократить сроки рассмотрения заявок и повысить их прозрачность. Использование электронных патентных заявок и цифровых сертификатов с QR-кодами облегчило идентификацию правообладателей и ускорило обмен данными между исследовательскими институтами, производственными предприятиями и государственными органами [7].

Во-вторых, отмечено усиление институциональной поддержки инновационной деятельности. Государственные программы в сфере цифрового управления интеллектуальной собственностью, реализуемые при содействии KOICA и ВОИС, создают основу для автоматизации экспертных процедур и интеграции национальной базы патентов в международную систему поиска и мониторинга. Это способствует более надёжной защите технологий кормопроизводства, включая методы микрокапсулирования жиров, ферментативную стабилизацию активных веществ и использование растительных экстрактов. В-третьих, наблюдается рост активности национальных заявителей. Согласно данным Агентства по интеллектуальной собственности, за последние три года количество заявок на изобретения в области биотехнологий и кормовых добавок увеличилось более чем на 40%, что свидетельствует о положительном воздействии цифровых реформ на инновационную активность исследователей и производителей [8].

В-четвёртых, сформирована нормативно-правовая база, направленная на борьбу с нарушениями прав интеллектуальной собственности. Введены новые статьи в Кодекс об административной ответственности, предусматривающие штрафы и конфискацию продукции при незаконном использовании патентованных технологий. Эти меры особенно актуальны для отрасли кормовых добавок, где высок риск подделок и несанкционированного копирования технологических процессов [9].

В-пятых, проведённый сравнительно-правовой анализ показал, что Узбекистан постепенно приближается к международным стандартам правовой защиты инноваций, включая практику Европейского патентного ведомства (EPO) и Сингапурского управления интеллектуальной собственности (IPOS). Внедрение автоматизированных баз данных и использование искусственного интеллекта при патентных экспертизах открывают перспективы для сокращения субъективности при оценке новизны и изобретательского уровня технологий.

Таким образом, полученные результаты подтверждают, что цифровизация механизмов охраны интеллектуальной собственности оказывает системное влияние на развитие инновационного потенциала отрасли кормовых добавок. Она способствует росту доверия между государством, бизнесом и научным сообществом, укрепляет правовую предсказуемость и создаёт условия для трансфера технологий, экспорта знаний и долгосрочной инвестиционной устойчивости аграрного сектора Узбекистана.

Обсуждение

Современное развитие технологий в сфере кормопроизводства и биотехнологий в Узбекистане требует не только совершенствования научных подходов, но и создания эффективного механизма правовой защиты результатов интеллектуальной деятельности. В частности, технологии микрокапсулирования, биокаталитической ферментации и использования растительных экстрактов в составе кормовых добавок представляют собой сложные инновационные решения, требующие адекватного законодательного и цифрового сопровождения.

Одним из ключевых направлений государственной политики в этой области является цифровизация процедур регистрации и защиты объектов интеллектуальной собственности. В 2025 году в сотрудничестве с Корейским агентством международного сотрудничества KOICA и Министерством юстиции Республики Узбекистан реализуется проект «*Improvement of the*

Intellectual Property Public Administration System in Uzbekistan», предусматривающий создание цифровых сервисов, систем на основе искусственного интеллекта и публичных баз данных для патентных заявок [8]. Этот проект стоимостью более 9,73 млн долларов США является важным шагом к формированию открытой, прозрачной и технологически устойчивой экосистемы интеллектуальной собственности.

Не менее значимыми стали реформы 2025 года, направленные на ужесточение ответственности за нарушение прав на объекты интеллектуальной собственности. Введены более строгие меры за незаконное использование изобретений, присвоение авторства и разглашение коммерческой тайны. Нововведения включают возможность автоматической выдачи патентов через электронную систему, что сокращает бюрократические барьеры и повышает доверие со стороны исследователей и предпринимателей [9].

Важным элементом обсуждения цифровизации охраны интеллектуальных прав является интернационализация правовой политики Узбекистана. В ходе официального визита генерального директора Всемирной организации интеллектуальной собственности (ВОИС) Дарена Танга в Ташкент в мае 2025 года была подтверждена готовность Узбекистана адаптировать национальное законодательство к международным стандартам в области интеллектуальной собственности и цифрового патентного администрирования [10]. Это открывает новые перспективы для экспортоориентированных отраслей, включая производителей кормовых добавок, которые стремятся закрепить свои инновации на внешних рынках.

Внедрение электронных патентных платформ, QR-сертификатов и цифровых удостоверений прав способствует формированию новой культуры правовой прозрачности и доверия в сфере технологического предпринимательства. Как отмечают эксперты, данные процессы не только оптимизируют сроки регистрации и экспертизы заявок, но и обеспечивают защиту прав разработчиков в реальном времени [7].

Таким образом, в Узбекистане формируется комплексная модель цифровой трансформации правовой охраны интеллектуальной собственности, которая становится одним из стратегических факторов стимулирования инноваций. Для таких наукоёмких отраслей, как производство кормовых добавок, эта тенденция играет ключевую роль: правовая защищённость технологических решений напрямую определяет инвестиционную привлекательность, устойчивость научных исследований и конкурентоспособность национальных производителей на глобальном рынке.

Актуальность для отрасли кормовых добавок:

1. Производство кормовых добавок часто основано на сложных методиках: микрокапсулирование, биокаталитические процессы, использование растительных либо микроорганизмальных компонентов, обратимые модели доставки активных веществ. Эти методы требуют значительных исследований, патентования и коммерциализации. Пример: патент RU2733656C1 — кормовая добавка для крупного рогатого скота в виде микрокапсул с оболочкой из альгината и ядром из жмыха подсолнечника. [11]. Защита таких технологических инноваций требует наличия правовых механизмов, которые могут охватывать как состав и метод производства, так и технологические процессы, включая технологические секреты.

2. С распространением глобальной торговли, интернета и цифровых каналов передачи информации возрастает риск неправомерного использования технологий — копирования, пиратства, нарушения патентных, авторских или промышленных прав. Без адекватной законодательной защиты и цифровых инструментов отслеживания правообладатели рискуют потерять коммерческую ценность своих разработок.

Законодательные реформы и цифровизация в Узбекистане

Узбекистан в последние годы проводит значительные реформы в сфере защиты интеллектуальной собственности:

Упрощение процедуры регистрации объектов интеллектуальной собственности; сроки рассмотрения заявок сокращаются; некоторые документы исключаются из обязательного пакета при регистрации. [12]

Введение единых цифровых свидетельств с QR-кодами, что облегчает проверку прав и повышает прозрачность. [13]

Ужесточение ответственности за нарушения прав интеллектуальной собственности: введены административные и уголовные санкции, включая штрафы, конфискацию поддельной продукции и товары, ограничение свободы. [14]

Проект государственного уровня: сотрудничество с KOICA и Министерством юстиции по цифровизации системы управления интеллектуальной собственностью, включая автоматизацию выдачи патентов, электронные платформы и повышения прозрачности. [13]

Особенности защиты технологических инноваций в кормовой промышленности

Защита инноваций, связанных с кормовыми добавками, имеет свои особенности:

Патентоспособность и инновационность: необходимо, чтобы технология была новой, неожиданной и практической. Для кормовых добавок важно документировать не только состав, но и эффективность, устойчивость, возможно данные полевых испытаний или лабораторных исследований [15].

Коммерческая тайна и технологические секреты: некоторые элементы производственного процесса могут не патентоваться, а защищаться как коммерческие тайны [18] — например, рецептура, условия производства, методы инкапсулирования и др.

Контроль над использованием брендов и торговых марок: торговая марка гарантирует качество и происхождение продукта [16]. Нарушения маркировки или фальсификация продуктов кормовой промышленности могут нанести серьёзный ущерб репутации и правовому статусу [17].

Рекомендации по совершенствованию правовой защиты:

1. Дальнейшее цифровое совершенствование процедур
Необходимо внедрение автоматизированных систем патентного и товарного знака, платформ электронной подачи документов, ускоренные сроки рассмотрения для заявок, особенно в смежных технологических сферах.

2. Усиление инспекционной и судебной практики
Правоохранительные органы и суды должны иметь ясные механизмы и прецеденты по делам, связанным с кормовыми добавками, для защиты патентных прав, даже в случаях трансграничных нарушений.

3. Программа поддержки для исследователей и производителей Государственные гранты, налоговые льготы и консультационные услуги по защите интеллектуальной собственности способствуют тому, чтобы сельскохозяйственные и научно-исследовательские учреждения активно патентовали разработки и защищали свои изобретения.

4. Обучение и повышение правосознания Обучение ученых, технологов, производителей кормов и юридических специалистов принципам интеллектуальной собственности, цифровым инструментам защиты (например, блокчейн, платформы отслеживания, QR-коды), соблюдению международных стандартов.

ЗАКЛЮЧЕНИЕ

Проведённый анализ показал, что эффективная защита интеллектуальной собственности в сфере технологий производства кормовых добавок является неотъемлемым условием устойчивого развития аграрного сектора и обеспечения продовольственной безопасности Узбекистана. Современные вызовы, связанные с цифровизацией, трансграничной торговлей и стремительным развитием биотехнологий, требуют от государства системного подхода к формированию правовых и организационных механизмов охраны инноваций.

Реформы, реализуемые в Узбекистане, — упрощение патентных процедур, внедрение цифровых реестров и QR-свидетельств, усиление ответственности за нарушения — создают благоприятную основу для формирования прозрачной и эффективной системы защиты прав интеллектуальной собственности. Вместе с тем требуется дальнейшее развитие судебной и экспертной практики, повышение цифровой грамотности участников рынка и интеграция национальной системы с международными стандартами.

Важным направлением становится формирование культуры правовой защиты инноваций среди исследователей, производителей и предпринимателей. Только при сочетании законодательной стабильности, цифровых технологий и научного потенциала возможно обеспечить надёжную охрану инноваций в кормопроизводстве, стимулировать инвестиции, укрепить конкурентоспособность отечественных производителей и создать устойчивые предпосылки для технологического прогресса и экспортного потенциала отрасли.

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WOMEN AND THE LAW

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Abstract: The article explores the historical evolution, current status, and challenges of women's rights in the context of the law. It highlights the transformation of legal systems from patriarchal structures to modern frameworks that aim to ensure gender equality and justice. The research focuses on the legal, social, and institutional barriers that have limited women's access to justice and equal opportunities, as well as the progress achieved through international conventions and national reforms. Emphasis is placed on the role of law in empowering women, protecting their rights in family, labor, and political spheres, and addressing issues such as domestic violence, discrimination, and legal representation. The study underscores the importance of strengthening gender-sensitive legal mechanisms to promote fair and inclusive societies.

Keywords: Women's rights; gender equality; legal reform; discrimination; justice; human rights; empowerment.

Throughout history, the relationship between women and the law has reflected broader social, cultural, and political dynamics. For centuries, legal systems across the world were constructed upon patriarchal norms that confined women's rights and reinforced gender inequality. Women were often denied legal personhood, property ownership, voting rights, and participation in public life. These restrictions were justified through religious interpretations, traditional customs, and political ideologies that placed men in dominant positions within the family and society. The emergence of human rights discourse in the 20th century brought about a profound transformation in the legal status of women. Landmark events such as the adoption of the Universal Declaration of Human Rights (1948) and the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW, 1979) established a global framework for gender equality and legal protection. These documents recognized women not merely as dependents within family structures but as autonomous individuals entitled to full legal capacity. Despite notable progress, legal inequality remains a persistent global issue. In many societies, women continue to face barriers to justice, limited access to legal representation, gender-based violence, and discriminatory laws related to marriage, inheritance, and employment. The intersection of gender with other social factors—such as class, race, and religion—further complicates women's legal experiences. Therefore, examining women and the law is essential to understanding how legal institutions can both reinforce and challenge gender hierarchies. This study aims to analyze the evolution of women's legal status, identify ongoing challenges, and evaluate the role of legal reforms and advocacy in advancing gender justice. The research on “Women and the Law” was conducted using an interdisciplinary and analytical framework aimed at understanding both the evolution and the current challenges of women's legal status worldwide. The study is grounded in qualitative research methodology, integrating legal, sociological, and historical perspectives to ensure a comprehensive analysis of women's rights in the legal context. This study adopts a descriptive–analytical design that explores how legal norms have

developed in response to women's rights movements and gender equality policies. It is non-experimental and relies primarily on document analysis, comparative law, and interpretive methods. The approach emphasizes the relationship between legal reforms and social change affecting women's empowerment. The study draws on a wide range of materials, including: International legal documents such as the Universal Declaration of Human Rights (1948), CEDAW (1979), the Beijing Declaration and Platform for Action (1995), and relevant UN General Assembly resolutions; Regional instruments including the European Convention on Human Rights (ECHR), the African Charter on Human and Peoples' Rights, and the Inter-American Convention on the Prevention, Punishment, and Eradication of Violence against Women; National legislation from selected countries — for instance, the United States, France, India, and Uzbekistan — to compare diverse approaches to women's legal protection; Academic literature and empirical studies published in international law journals and gender studies resources; Reports and statistical data from global organizations such as UN Women, World Bank, and Amnesty International on gender-based discrimination, labor participation, and legal access. Several methods were employed to analyze the collected materials: This method was used to evaluate differences in how various legal systems — common law, civil law, and religious law — address women's rights. By comparing legislation and judicial decisions, the study identifies effective legal frameworks and areas requiring reform. The historical method traces the development of women's legal status from pre-modern patriarchal societies to contemporary legal systems that emphasize equality before the law. This provides insight into how traditional values and political movements have shaped current norms. Legal texts, policy papers, and academic works were systematically examined to extract key themes related to gender equality, justice, and human rights. To complement the legal dimension, sociological perspectives were applied to explore the role of culture, religion, and education in shaping public attitudes toward women's legal participation and access to justice. The research includes detailed case studies of landmark legal decisions — such as *Brown v. Board of Education* (U.S.), *Vishaka v. State of Rajasthan* (India), and *Akhmedova v. Russia* — that have influenced the protection and promotion of women's rights globally. All gathered data were categorized thematically according to the type of right (civil, political, economic, and social). Qualitative coding was used to identify recurring patterns in legal discourse and policy implementation. Statistical data on gender-based inequality were reviewed using descriptive analysis to support the legal findings. The study acknowledges certain limitations, such as the unequal availability of gender-specific legal data among different jurisdictions and the evolving nature of international human rights norms. Nevertheless, these limitations do not diminish the analytical value of the research. The study revealed that despite global progress in women's legal status, significant gender inequalities remain within national legal systems. Three main areas were identified: legal recognition, protection, and participation. Legal recognition: Most countries guarantee equality before the law, yet discriminatory norms persist, especially in matters of inheritance, marriage, and property rights. In some regions, women's testimony and ownership rights remain legally limited. Although many nations have adopted laws against domestic violence and harassment, enforcement remains weak. Data show that less than half of gender-based violence cases reach court, with conviction rates below 20%. Women's representation in the judiciary and legal professions has grown to 36% globally, but remains low in higher courts and political institutions. Impact of international law: Conventions such as CEDAW have encouraged reforms, yet traditional

and religious norms continue to hinder implementation. Overall, the results show gradual improvement in legal equality, but persistent structural and cultural barriers still prevent women from fully realizing their rights. The results demonstrate that legal equality for women has improved considerably over recent decades, yet deep-rooted cultural and institutional barriers continue to limit real progress. Although many countries have aligned their laws with international standards such as CEDAW, the implementation gap remains significant. Weak enforcement, judicial bias, and insufficient awareness among women about their legal rights contribute to persistent inequality. Socio-cultural traditions often override formal laws, especially in rural and conservative communities. At the same time, increasing female participation in the legal profession and digital access to justice represent positive trends that can accelerate equality. Governments and international organizations must strengthen legal education, gender-sensitive training for law enforcement, and monitoring mechanisms to ensure that rights guaranteed by law are effectively protected in practice. In conclusion, the path toward genuine legal equality requires not only legislative reform but also a shift in societal attitudes and institutional behavior. The study concludes that although significant progress has been made in promoting women's legal rights worldwide, true equality before the law has not yet been fully achieved. Legal reforms have improved women's recognition and protection, but the implementation gap between written laws and actual practice remains a major obstacle. To achieve genuine justice, states must ensure the effective enforcement of gender-equality laws, eliminate discriminatory practices, and strengthen women's participation in decision-making at all levels of the legal system. Ultimately, women's empowerment through law requires not only legislative change, but also cultural transformation, education, and sustained institutional commitment to human rights and equality.

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МИХАИЛ ИВАНОВИЧ КУРЗИН

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ВВЕДЕНИЕ

Русское и среднеазиатское искусство в начале XX века переживало трудный, но продуктивный период. Одним из художников, работавших в столь непростое время, был Михаил Иванович Курзин (1888-1957), занявший особое место в истории его творческих изысканий и авангардного осмысления жизни Востока. Его произведения сегодня считаются важной частью художественного наследия Узбекистана и всего региона. Его путь соединяет в себе опыт русской художественной школы и уникальное осмысление восточной культуры. Курзин вошел в историю как мастер, который сумел объединить авангардные поиски с национальными мотивами, создав неповторимый художественный язык.

Жизнь и творчество

Михаил Курзин родился в 1888 году. С юных лет проявлял интерес к живописи, что определило его дальнейший жизненный выбор. Он получил художественное образование в Московском училище живописи, ваяния и зодчества, где учился у выдающихся мастеров своего времени. Именно там у Курзина сформировался интерес к экспериментам с формой и цветом, а также внимание к новаторским течениям в искусстве. В его творческом становлении чувствуется сильное влияние русского модернизма, кубизма и экспрессионизма. Творческий поиск и участие в объединениях. В начале своей творческой карьеры Михаил Курзин примкнул к художественным объединениям «Бубновый валет» и «Амаравелла». Эти группы объединяли художников, стремившихся к поиску новых художественных форм и к разрушению академических канонов. Участие в таких объединениях помогло Курзину

выработать собственное творческое мировоззрение, основанное на свободе выражения и сочетании традиции с новаторством.



М. Курзин. «Торговец».
Начало 20-х гг. Бумага,
гуашь, трафарет

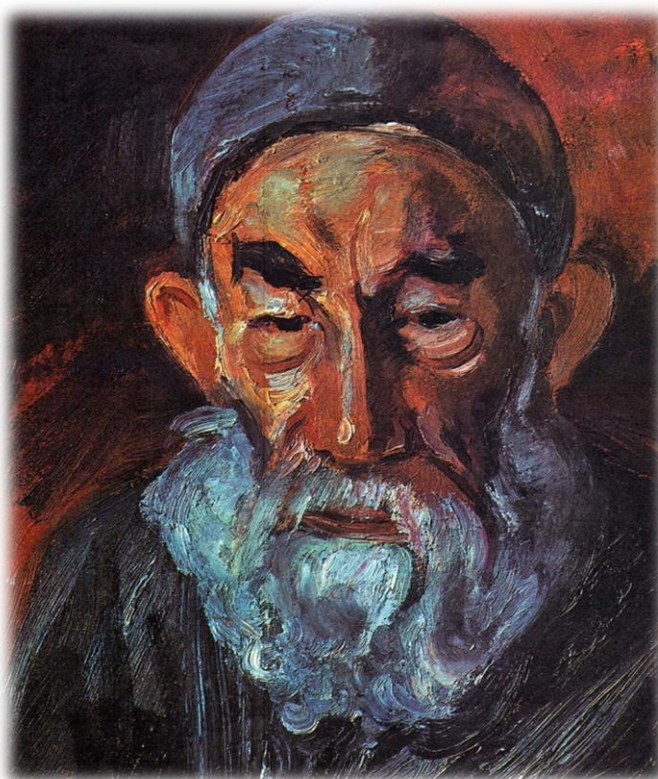
татарски — «Бухарай», подразумевая караванщиков знаменитого древнего торгового маршрута с Оби и Иртыша в Бухару. Когда в конце 1980-х — начале 1990-х музеи получили относительную самостоятельность, Бухарским государственным историко-художественным музеем-заповедником первым делом был издан необычный для этих мест отдельный цветной каталог работ Курзина. Сведения о российско-узбекском художнике размещены и в других изданных упомянутым учреждением каталогах. В 2021 году в честь Курзина, за его вклад в культуру Бухары на

Период жизни в Средней Азии Приехав в Ташкент в 1923 году, художник начал черпать вдохновение в пейзажах местной культуры и быта. Этот период стал для него особенно плодотворным. Художник не только создавал полотна, но и преподавал, активно участвуя в культурной жизни региона. Восточная культура, колоритная природа и богатая история Средней Азии оказали огромное влияние на его живопись. Работал в театральном исполнительском искусстве, газетной графике, ученичестве. В 1927 году он активно участвовал в создании творческого объединения под названием «Мастера Нового Востока». В своих работах Курзин обращался к темам быта, духовности, народных традиций, изображал сцены из жизни Узбекистана, раскрывая их через яркие цвета, смелые композиции и экспрессивную манеру письма. Его картины отличались особой эмоциональностью и декоративностью, что делало их близкими как к авангардным поискам, так и к

народному искусству.

В Бухаре до сих пор бережно хранят память о Михаиле Курзине. Старожилы вспоминают, что коллеги обращались к нему «Михаил ибн Иванович», а в родной Сибири по-

городской Аллее памяти было специально высажено дерево.



Михаил Курзин. Портрет бухарского ювелира и миниатюриста Садриддина Поччаева. 1946

Стиль и особенности творчества

Ключевая особенность творчества Курзина — синтез западноевропейского авангарда и восточных художественных традиций. В его живописи можно увидеть влияние экспрессионизма и примитивизма, но при этом в ней всегда ощущается связь с культурой Средней Азии. Художник стремился передать не только внешние черты изображаемого, но и его внутреннюю сущность, духовное содержание. Несмотря на то, что Михаил Курзин жил в сложное для искусства время, его творчество стало важным вкладом в развитие живописи Узбекистана и всего постреволюционного художественного процесса. Его работы хранятся в музеях и частных коллекциях, а имя художника с каждым годом привлекает всё больше внимания исследователей и ценителей искусства.

Курзин сумел соединить в своем творчестве разные культурные традиции, показать уникальный образ Востока через призму авангардных поисков. Его жизнь и творчество служат примером того, как художник может преодолеть границы времени и пространства, создавая искусство, понятное разным поколениям.

Эксперименты с техниками и средствами визуального выражения

Курзин пробовал себя не только в живописи, но и в плакате, графике, коллаже, трафарете. Этот широкий диапазон позволял ему варьировать стиль в зависимости от задачи, сочетать простоту выразительности с идеологической нагрузкой. Отказ от детальной обстановки, фокус на фигурах и символах. Во многих работах Курзин минимизирует фон, детализацию интерьеров, ставя в центр композиции саму фигуру или группу фигур, их жесты, окраску, соотношение форм.



Курзин Михаил Иванович «Нанбайлар»

Последние годы и значение наследия

В послевоенный период Курзин продолжал работать, однако был вынужден ограничиваться менее радикальными формами. Умер он в 1957 году, так и не дождавшись признания.

Сегодня его произведения рассматриваются как важный этап развития авангардного искусства в Средней Азии. Они представляют интерес не только с художественной, но и с культурологической точки зрения: Курзин сумел воплотить в своих работах идею взаимодействия русской и восточной культур.

Заключение

Жизнь и творчество Михаила Ивановича Курзина отражают не только индивидуальную судьбу художника, но и целую эпоху в развитии отечественного искусства. Его путь — это пример противоречий, в которых оказались многие мастера авангарда: стремление к эксперименту и поиску новых художественных форм сталкивалось с давлением идеологической системы, требовавшей подчинения доктрине социалистического реализма.

Курзин сумел соединить западноевропейские художественные тенденции начала XX века с культурным наследием Средней Азии, создав оригинальный и самобытный стиль. В его картинах ярко проявляется экспрессионистская экспрессия, смелая деформация форм, напряжённая энергетика цвета, которые при этом гармонируют с декоративностью и

национальным колоритом восточной культуры. Такое сочетание делает его творчество уникальным явлением в истории советского искусства. Несмотря на то что при жизни художник подвергался критике, его искусство оказалось более значительным и долговечным, чем временные идеологические установки. Сегодня наследие Курзина ценно не только как художественное явление, но и как важный историко-культурный источник: его работы демонстрируют процессы культурного взаимодействия России и Средней Азии, а также свидетельствуют о многообразии художественных поисков 1920–1930-х годов. Возвращение имени Михаила Курзина в научный и музейный оборот открывает новые перспективы для изучения отечественного авангарда. Его наследие подтверждает, что истинное искусство, даже подвергнутое забвению или осуждению, со временем находит признание. Курзин принадлежит к тому поколению художников, чьё творчество продолжает вдохновлять исследователей и зрителей, напоминая о ценности свободы художественного самовыражения и силе искусства, способного преодолевать границы времени и идеологий.



Курзин Михаил Иванович «В гости»

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**ФИЛОЛОГИЧЕСКИЙ АНАЛИЗ РОМАНА М. А. БУЛГАКОВА “МАСТЕР
И МАРГАРИТА”**

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ANNOTATSIYA: Ushbu maqolada Mixail Bulgakovning “Usta va Margarita” romaniga filologik tahlil berilgan. Asarning kompozitsion tuzilishi, janr jihatidan ko‘p qatlamlilik, obrazlar tizimi, ramziyligi va badiiy til xususiyatlari ko‘rib chiqiladi. Tahlilda Moskva va Yershalaim boblari o‘rtasidagi o‘zaro bog‘liqlik ochib beriladi, shuningdek, Bibliya, Gyotening “Faust” asari va rus adabiyoti klassikasi bilan intertekstual aloqalar ko‘rsatiladi. Romaning falsafiy muammolari — yaxshilik va yomonlik o‘rtasidagi munosabat, ozodlik va qo‘rquv mavzusi, senzura sharoitidagi ijodkor taqdiri — alohida e‘tiborga olinadi. Asarning polifonik xarakteri va uning XX asr rus va jahon madaniyatidagi ahamiyati haqida xulosa qilinadi.

Kalit so‘zlar: Bulgakov, Usta va Margarita, filologik tahlil, kompozitsiya, ramziylik, intertekstualik, yaxshilik va yomonlik, falsafiy muammo, ijodkor taqdiri, sehrli realizm.

АННОТАЦИЯ: В статье представлен филологический анализ романа Михаила Булгакова «Мастер и Маргарита». Рассматриваются композиционная структура произведения, жанровая многослойность, система персонажей, символика и особенности художественного языка. Анализ выявляет взаимосвязь между московскими и ершалаимскими главами, показывает роль интертекстуальных связей с Библией, «Фаустом» Гёте и классикой русской литературы. Особое внимание уделяется философской проблематике романа: взаимодействию добра и зла, теме свободы и страха, судьбе художника в условиях цензуры. Делается вывод о полифоническом характере произведения и его значении для русской и мировой культуры XX века.

Ключевые слова: Булгаков, Мастер и Маргарита, филологический анализ, композиция, символика, интертекстуальность, добро и зло, философская проблематика, судьба художника, магический реализм.

ABSTRACT: The article presents a philological analysis of Mikhail Bulgakov's novel The Master and Margarita. It examines the compositional structure, genre multilayeredness, character system, symbolism, and stylistic features of the text. The

analysis reveals the connection between the Moscow and Yershalaim chapters and highlights intertextual links with the Bible, Goethe's *Faust*, and the classics of Russian literature. Special attention is paid to the novel's philosophical issues: the interplay of good and evil, the themes of freedom and fear, and the fate of the artist under censorship. The conclusion emphasizes the polyphonic nature of the work and its significance for both Russian and global culture of the 20th century.

Keywords: Bulgakov, The Master and Margarita, philological analysis, composition, symbolism, intertextuality, good and evil, philosophical themes, fate of the artist, magical realism.

ВВЕДЕНИЕ: Роман Михаила Булгакова «Мастер и Маргарита» — одно из ключевых произведений русской литературы XX века. Завершённый в 1940 году и опубликованный лишь в 1960-е, он вобрал в себя художественные поиски и трагический опыт эпохи, став многослойным текстом, насыщенным культурными, философскими и религиозными смыслами.

Актуальность филологического анализа романа объясняется его жанровой и стилевой многогранностью: это и сатира, и философская притча, и любовная история, и религиозно-мистическая драма. Центральной темой остаётся конфликт добра и зла, истины и лжи, свободы и предопределённости. Московские главы сатирически изображают советскую действительность, тогда как ершалаимские — философскую проблематику власти и ответственности[1]. Система образов играет ключевую роль: Воланд олицетворяет не абсолютное зло, а силу, восстанавливающую справедливость; Иешуа символизирует истину и духовную чистоту; Пилат — сомнение и трусость; Мастер — судьбу художника в условиях тоталитаризма; Маргарита — верность и жертвенную любовь.

Важна и символика: мотив луны, противопоставление света и тьмы, бал у сатаны, фраза «Рукописи не горят». Эти образы формируют философскую основу текста и выводят его за пределы историко-бытовой рамки.

Стиль романа строится на контрасте: гротеск и сатира московских глав противопоставлены библейской возвышенности ершалаимских. Интертекстуальность соединяет роман с Библией, «Фаустом» Гёте, русской классикой, что придаёт произведению универсальное звучание[2].

Таким образом, «Мастер и Маргарита» — это многоплановое произведение, где художественная форма и философское содержание

неразделимы. Его анализ позволяет понять, как литература способна сохранять и транслировать вечные смыслы в условиях исторических ограничений.

МЕТОДЫ ИССЛЕДОВАНИЯ: Филологический анализ романа Булгакова строится на сочетании нескольких исследовательских подходов. В основе лежит структурный метод, позволяющий рассмотреть композицию текста, организацию повествования и взаимодействие его частей. Через анализ структуры выявляется, как роман соединяет московские и ершалаимские главы, как работает принцип «романа в романе», каким образом контрастные стиливые пласты формируют единую художественную систему[3].

Важное место занимает стилистический анализ. Он предполагает изучение языковых особенностей текста: использования сатирических и иронических приёмов, библейского синтаксиса и интонаций, элементов магического реализма. Особое внимание уделяется контрасту между бытовой речью московских персонажей и возвышенным стилем ершалаимских глав, что отражает двойственную природу романа.

Интертекстуальный метод необходим для выявления литературных и культурных источников произведения. Сравнение романа с Библией, «Фаустом» Гёте, произведениями Гоголя и Достоевского позволяет увидеть, каким образом Булгаков выстраивает диалог с традицией и одновременно создаёт оригинальную художественную систему.

К исследованию также применяется сравнительно-исторический подход. Он помогает понять, как в условиях советской действительности роман осмысляет судьбу художника, проблему свободы слова и цензуры.

Таким образом, методы исследования опираются на комплексный анализ текста, где композиция, язык, символика и культурные связи рассматриваются в их взаимосвязи. Такой подход позволяет выявить целостность художественного мира романа и раскрыть его значение для русской и мировой литературы[4].

РЕЗУЛЬТАТЫ ИССЛЕДОВАНИЯ: Филологический анализ романа М. Булгакова «Мастер и Маргарита» выявляет основные уровни его художественной организации: композицию, систему персонажей, символику, стиль и интертекстуальные связи.

Композиция. Роман построен на двойной структуре: московские главы сатирически изображают советскую действительность, тогда как ершалаимские представлены как философская притча о Понтии Пилате и Иешуа. Эти линии не

только противопоставлены, но и дополняют друг друга, а приём «романа в романе» усиливает многослойность произведения.

Система персонажей. Воланд предстает не как абсолютное зло, а как сила, выявляющая истинную сущность людей. Иешуа символизирует истину и духовную свободу; Пилат — внутренний конфликт власти и совести; Мастер — судьбу художника в условиях цензуры; Маргарита — верность и жертвенную любовь[8].

Символика. Луна отражает переживания персонажей, мотив света и тьмы выражает борьбу истины и лжи, бал у сатаны раскрывает пороки общества. Фраза «рукописи не горят» символизирует вечность искусства[5].

Художественный язык. Московские главы написаны в сатирическом ключе, с элементами гротеска и бытовой речи, а ершалаимские — в стиле, близком к библейскому, что создаёт контраст и подчеркивает внутреннее единство текста. Магический реализм соединяет реальное и фантастическое.

Интертекстуальные связи. Роман вступает в диалог с Библией и «Фаустом» Гёте, а также опирается на традиции русской классики — Гоголя, Достоевского, Лермонтова. Это выводит произведение на уровень мировой культуры.

Философская проблематика. Произведение осмысляет вопросы добра и зла, свободы и страха, судьбы художника в условиях давления. Булгаков утверждает сложность моральных категорий и вечность искусства.

Исторический контекст и влияние. Написанный в годы цензуры, роман отражает социальные реалии 1930-х, но выходит за их пределы, сохраняя универсальное звучание. После публикации он вызвал широкий резонанс, получил множество интерпретаций и занял значимое место в мировой культуре[6].

ИТОГОВОЕ ОБСУЖДЕНИЕ: Таким образом, результаты филологического анализа романа встраиваются в широкий контекст культурных и философских размышлений. Булгаков показал, что искусство способно соединить эпохи и культуры, поставить вечные вопросы и предложить оригинальные ответы. «Мастер и Маргарита» предстает как роман-полифония, где соединены сатира и философия, реальность и фантазия, любовь и смерть, добро и зло[7].

ЗАКЛЮЧЕНИЕ: Филологический анализ романа Михаила Булгакова «Мастер и Маргарита» показывает, что это произведение занимает особое место не только в русской, но и в мировой литературе XX века. Его уникальность заключается в синтезе жанров, стилей и культурных традиций, что делает текст многослойным и открытым для разнообразных интерпретаций.

Композиционная структура романа, основанная на чередовании московских и ершалаимских глав, раскрывает идею диалога эпох и культур. Жанровая многослойность позволяет объединить сатиру, философскую притчу, любовную историю и элементы мистики. Система персонажей приобретает символическое измерение: каждый герой выражает определённые философские и нравственные категории, а их взаимодействие формирует полифонию смыслов.

Особое значение имеют символика и художественный язык произведения. Символы света и тьмы, луны, бала у Сатаны и знаменитая формула «рукописи не горят» превращают роман в философскую притчу о бессмертии искусства и вечном противостоянии добра и зла. Язык романа сочетает разговорную и возвышенную речь, сатиру и библейскую интонацию, что делает текст художественно уникальным[9].

В более широком контексте роман отражает судьбу художника в условиях цензуры, раскрывает проблему власти и совести, исследует вечные категории морали и философии. Булгаков вступает в диалог с Библией, «Фаустом» Гёте, классикой русской литературы, создавая произведение, которое сохраняет актуальность в любые времена.

Таким образом, «Мастер и Маргарита» — это роман-полифония, соединяющий разные пласты культуры и искусства. Его значение заключается не только в художественной ценности, но и в способности ставить перед читателем вечные вопросы: о природе добра и зла, о свободе и страхе, о судьбе искусства и его бессмертии. Для филологической науки роман остаётся неисчерпаемым источником исследований, а для мировой культуры — одним из величайших произведений XX века.

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Developing Students' Critical Thinking through Innovative Approaches in English Language Instruction at Universities

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Abstract: This paper explores innovative pedagogical approaches for developing critical thinking among university students in English language instruction. In today's globalized academic environment, English serves not only as a medium of communication but also as a means of intellectual engagement and analytical inquiry. The study examines how critical thinking can be systematically integrated into English language curricula through interactive, student-centered methodologies. The research highlights the significance of reflective learning, problem-based tasks, and digital learning tools as mechanisms to foster independent reasoning and creativity. Findings suggest that implementing such approaches enhances students' cognitive flexibility, academic performance, and lifelong learning competence.

Keywords: Critical thinking, innovation, English language instruction, higher education, pedagogy, student-centered learning.

Introduction

Critical thinking has become a fundamental objective of higher education worldwide. In the context of English language instruction, it is no longer sufficient for students to acquire linguistic competence alone; they must also develop analytical and evaluative skills to interpret information critically. This study aims to identify effective pedagogical strategies that promote students' critical thinking skills in university-level English courses.

Methodology:

A mixed-method approach was applied, combining qualitative classroom observations with quantitative surveys among university students majoring in English. Experimental lessons utilizing debate, project-based learning, and digital media analysis were conducted across three academic semesters. The study also evaluated the impact of teacher facilitation techniques on students' engagement and reasoning ability.

Results and Discussion:

Data indicate that innovative approaches — including Socratic questioning, problem-based tasks, and reflective writing — significantly improve students' ability to analyze, synthesize, and evaluate information. Students reported increased confidence in expressing independent opinions and engaging in academic discussions in English. Furthermore, integrating technology-based platforms (such as online collaborative writing tools and critical media analysis) contributed to sustained motivation and deeper learning outcomes.

Conclusion

Developing critical thinking through English language instruction requires intentional pedagogical design that combines innovation, interaction, and reflection. The study concludes that university educators should shift from content-centered teaching to inquiry-based learning models that empower students as active thinkers. Such an approach not only strengthens linguistic proficiency but also prepares learners to navigate complex global challenges with intellectual autonomy and creativity.

THE ECONOMIC AND LEGAL ROLE OF NON-GOVERNMENTAL NON-PROFIT ORGANIZATIONS IN UZBEKISTAN

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Keywords: NGO, civil society, rule of law, economic reforms, grant system, public order, Uzbekistan.

Introduction

The acquisition of state independence by the Republic of Uzbekistan marked the beginning of a new stage in the country's social and economic development. Since then, extensive reforms have been implemented in all spheres of life to establish a democratic state governed by the rule of law and a market-based economy. Within this transformation, non-governmental non-profit organizations (NGOs) have emerged as a key element of civil society. They play an important role in protecting human rights, providing social services, promoting public awareness, and strengthening the partnership between the state and society.

1. Legal Status and Economic Nature of NGOs

According to the Law of the Republic of Uzbekistan “On Non-Governmental Non-Profit Organizations” (April 14, 1999), an NGO is a self-governing organization established voluntarily by individuals and/or legal entities that does not pursue profit-making as its main objective. An NGO acquires the status of a legal entity only after its state registration with the Ministry of Justice (Article 21). Generally, NGOs are established for an unlimited period, which ensures the sustainability of their operations. The main differences between NGOs and commercial entities are as follows:

- The primary goal is not profit generation, but the fulfillment of socially significant objectives.
- All income must be used to achieve statutory purposes, not distributed among founders or members.
- NGOs may engage in entrepreneurial activity, but only if it serves their statutory goals.

These principles determine the economic and legal nature of NGOs — their financial activities are instrumental, not profit-driven.

2. Development of NGOs in Uzbekistan: Institutional and Statistical Overview

In recent years, the development of civil society institutions has become a strategic priority for Uzbekistan. According to data from the Ministry of Justice (2024), there are 11,981 registered NGOs and their branches across the country — nearly double the

number in 2016 [1]. NGOs operate in various fields, including social protection, environmental protection, gender equality, youth development, and legal awareness. According to the United Nations Development Programme (UNDP) 2025 report, more than 20 NGOs in Uzbekistan provided legal and social assistance to over 2,000 citizens under joint projects [2]. Similarly, the Bertelsmann Transformation Index (BTI) 2024 report states that about 3,000 NGOs operate as independent civic initiatives [3].

3. Financial Sources and Economic Activities of NGOs

The financial sustainability of NGOs in Uzbekistan is supported by several key sources:

1. Targeted funds and grants from donors and charities;
2. State social orders for the provision of public services;
3. Entrepreneurial activities consistent with statutory goals (e.g., training, consulting, publications).

For instance, the Ekosan Foundation, one of the leading environmental NGOs, has attracted nearly 2.5 billion UZS in donor funding for ecological projects between 2022 and 2023 [4]. This demonstrates that NGOs contribute to the economy by reinvesting funds into socially useful projects rather than pursuing personal or corporate profit.

4. Challenges and Prospects for Development

- ✓ Despite progress, several structural challenges persist in the NGO sector:
- ✓ Complex and lengthy registration procedures;
- ✓ Bureaucratic barriers in obtaining foreign grants;
- ✓ Financial dependence on external donors;
- ✓ The predominance of GONGOs (government-organized NGOs) limiting independent initiatives [5].

Since 2021, a series of reforms have aimed to address these issues: expansion of state social contracting mechanisms, introduction of tax incentives for NGOs, and establishment of partnership frameworks such as the “Mahalla–NGO–State” model. These reforms seek to strengthen NGOs as legitimate and sustainable participants in the country’s socio-economic development.

5. Conclusion and Recommendations

The experience of Uzbekistan shows that NGOs are a vital part of the emerging civil society and effective partners of the state in addressing social challenges. To enhance their effectiveness, the following measures are recommended:

1. Simplify registration and reporting procedures for NGOs.
2. Ensure transparency and efficiency in foreign grant approval processes.
3. Establish a national grant fund to support social projects.

4. Expand state procurement and contracting for NGO-led services.
5. Promote youth engagement and volunteerism in NGO activities.

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INGLIZ TILI DARSLARIDA INTERAKTIV METODLARDAN FOYDALANISHNING SAMARADORLIGI

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Annotatsiya

Ushbu tezisdagi ingliz tili darslarida interaktiv metodlardan foydalanishning o'quvchilarning bilim va ko'nikmalarini rivojlantirishdagi ahamiyati tahlil qilinadi. Shuningdek, bu metodlarning o'quvchilarda muloqot madaniyatini shakllantirish, mustaqil fikrlash va dars jarayonida faollikni oshirishdagi o'rni yoritiladi. Amaliy misollar asosida interaktiv yondashuvning samaradorligi ko'rsatilgan.

Kalit so'zlar: interaktiv metodlar, ingliz tili, ta'lim samaradorligi, motivatsiya, kommunikativ kompetensiya.

Abstract

This thesis analyzes the importance of using interactive methods in English language classes for developing students' knowledge and skills. It also highlights the role of these methods in fostering communication culture, promoting independent thinking, and increasing learners' engagement during the learning process. The effectiveness of the interactive approach is demonstrated through practical examples.

Keywords: interactive methods, English language, learning effectiveness, motivation, communicative competence.

Аннотация

В данной тезисе анализируется значение использования интерактивных методов на уроках английского языка в развитии знаний и навыков учащихся. Кроме того, освещается роль этих методов в формировании коммуникативной культуры, развитии самостоятельного мышления и повышении активности учащихся в процессе обучения. Эффективность интерактивного подхода показана на основе практических примеров.

Ключевые слова: интерактивные методы, английский язык, эффективность обучения, мотивация, коммуникативная компетенция.

Kirish

Bugungi globallashuv sharoitida chet tillarini, ayniqsa ingliz tilini o'qitishda innovatsion va interaktiv yondashuvlardan foydalanish tobora muhim ahamiyat kasb etmoqda. An'anaviy usullardan farqli o'laroq, interaktiv metodlar o'quvchini bilim oluvchi emas, balki faol ishtirokchi sifatida jalb etadi. Natijada o'quvchi til materialini faqat eslab qolmay, uni amalda qo'llashni o'rganadi.

Asosiy qism

Interaktiv metodlar o'quvchilarning til o'rganish jarayonini faollashtiradi, ularda ijodkorlik va mustaqil fikrlash qobiliyatini rivojlantiradi. Ingliz tili darslarida keng qo'llaniladigan samarali interaktiv usullar quyidagilardir:

- Rol o'ynash (role-play) va dramatizatsiya — o'quvchilarda muloqot va ifoda ko'nikmalarini mustahkamlaydi;
- Debatlar va munozaralar — tanqidiy fikrlash, dalil keltirish va o'z fikrini himoya qilishni o'rgatadi;
- Guruhli loyiha ishlari — hamkorlikda ishlash va mas'uliyatni bo'lishish malakasini rivojlantiradi;
- Interaktiv o'yinlar (quiz, kahoot, flashcards va b.) — o'rganish jarayonini qiziqarli va raqobatli qiladi;
- Axborot texnologiyalaridan foydalanish — onlayn resurslar yordamida o'quvchilarning media savodxonligini oshiradi.

Mazkur metodlardan foydalanish natijasida o'quvchilar tilni o'rganishga bo'lgan motivatsiyasini oshiradi, shuningdek, ularning kommunikativ kompetensiyasi yanada rivojlanadi.

Xulosa

Xulosa qilib aytganda, ingliz tili darslarida interaktiv metodlardan foydalanish nafaqat o'quvchilarning til o'rganishga bo'lgan qiziqishini kuchaytiradi, balki ularning amaliy nutq malakasini rivojlantirishda ham samarali vosita bo'lib xizmat qiladi. Bunday yondashuv o'quvchini markazga qo'ygan ta'lim tamoyiliga mos bo'lib, ingliz tilini o'rganish jarayonini zamonaviy, ijodiy va samarali qiladi.

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AN INNOVATIVE MODEL OF ENTERPRISE MANAGEMENT BASED ON THE CONCEPT OF SUSTAINABLE DEVELOPMENT

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Аннотация

В данной статье анализируется инновационная модель управления предприятием, основанная на концепции устойчивого развития. В исследовании подчеркивается необходимость интеграции экологических, социальных и экономических принципов в структуры управления, а также роль инноваций как ключевого фактора конкурентоспособности в современной экономике. Анализируя глобальный опыт и локальные проблемы, исследование выявляет, как модели устойчивого управления могут обеспечить долгосрочную стабильность, снизить риски и повысить корпоративную ответственность. Результаты показывают, что предприятия, внедряющие инновационные модели управления, соответствующие принципам устойчивого развития, добиваются не только финансового роста, но и способствуют достижению более широких социальных и экологических целей.

Ключевые слова. Устойчивое развитие, управление предприятием, инновационная модель, конкурентоспособность, корпоративная ответственность, зеленая экономика, организационная трансформация, эффективность, стратегическое управление, социальная ответственность.

Abstract

This article analyzes the innovative model of enterprise management based on the concept of sustainable development. The research highlights the necessity of integrating environmental, social, and economic principles into management structures, emphasizing the role of innovation as the key driver of competitiveness in the modern economy. By evaluating global practices and local challenges, the study identifies how sustainable management models can ensure long-term stability, reduce risks, and enhance corporate responsibility. The findings suggest that enterprises adopting innovative management models aligned with sustainable development achieve not only financial growth but also contribute to broader societal and ecological goals.

Keywords. Sustainable development, enterprise management, innovation model, competitiveness, corporate responsibility, green economy, organizational transformation, efficiency, strategic management, social responsibility.

INTRODUCTION

The contemporary global economy is undergoing fundamental transformations driven by the increasing importance of sustainability and innovation. The challenges of climate change, environmental degradation, and socio-economic inequality necessitate a rethinking of traditional management paradigms. Enterprises can no longer be guided solely by profit maximization; instead, they must integrate principles of sustainable development into their strategic and operational frameworks. The concept of sustainable development, introduced in the Brundtland Report (1987) and reinforced by the United Nations' Sustainable Development Goals (SDGs), has become a guiding principle for both policymakers and business leaders.

In the modern economy, enterprises are expected to balance economic efficiency with ecological responsibility and social inclusion. This balance requires the creation of innovative management models that not only address market competition but also ensure long-term resilience and alignment with sustainability standards. Traditional management models, focused predominantly on short-term financial gains, often fail to account for environmental costs or social impacts. Consequently, the transition to sustainable and innovative models has become an essential strategic necessity for enterprises.

Innovation plays a central role in this transformation. Sustainable development cannot be achieved without technological advancements, new business models, and organizational restructuring. Enterprises must adopt innovative approaches in production, supply chains, energy consumption, and waste management to ensure resource efficiency and reduce negative ecological footprints. Furthermore, corporate governance and human resource management must evolve to foster creativity, inclusivity, and ethical behavior.

International experience demonstrates that innovative management models based on sustainability principles enhance competitiveness. European companies that integrated circular economy principles, for example, have reduced operational costs and improved brand reputation. Japanese corporations have successfully employed lean production methods that minimize waste while maximizing efficiency. Similarly, Scandinavian

enterprises lead in combining digital technologies with sustainability to achieve green innovations.

In Uzbekistan and other developing economies, the concept of sustainable development is gradually being embedded into business practices. Government strategies emphasize the need for modernization, ecological responsibility, and integration into the global green economy. However, many enterprises still face challenges in aligning management practices with sustainability due to limited financial resources, technological gaps, and institutional barriers.

The introduction of this article thus establishes the relevance of creating innovative enterprise management models grounded in sustainable development. Such models are essential not only for corporate competitiveness but also for ensuring long-term economic growth, social progress, and environmental protection. The aim of this study is to analyze the theoretical foundations, international best practices, and practical approaches for developing an innovative enterprise management model based on the concept of sustainable development, and to provide recommendations applicable to emerging economies such as Uzbekistan.

LITERATURE ANALYSIS AND METHODOLOGY

The concept of sustainable development has been extensively discussed in academic literature since the late 20th century. The Brundtland Report (1987) first introduced the idea of meeting present needs without compromising the ability of future generations to meet their own. Since then, sustainability has been expanded to encompass economic, social, and environmental dimensions, often referred to as the “triple bottom line.” Elkington (1997) formalized this framework, emphasizing that enterprises should not only focus on financial performance but also consider social equity and environmental integrity.

The management literature has increasingly addressed the integration of sustainability into corporate governance. Porter and Kramer (2011) introduced the concept of “shared value,” suggesting that companies can enhance competitiveness while simultaneously addressing social challenges. This approach bridges the gap between profitability and sustainability, framing innovation as a necessary condition for long-term success.

Scholars such as Hart and Milstein (1999) have highlighted the role of innovation in achieving sustainable development. Their studies demonstrate that technological advancements and process innovations enable enterprises to reduce ecological impacts while improving efficiency. Similarly, Nidumolu, Prahalad, and Rangaswami (2009)

argue that sustainability is the key driver of innovation in the 21st century, as companies that adopt green technologies and sustainable practices gain strategic advantages.

In addition to Western perspectives, Asian models of sustainable management have also attracted scholarly attention. Japanese firms, for example, pioneered lean production and kaizen principles, which focus on continuous improvement, waste reduction, and efficiency. These principles align closely with sustainable development goals and illustrate how cultural and managerial traditions can foster sustainability.

In the context of developing economies, researchers such as Sachs and Stiglitz emphasize the necessity of adopting sustainability-oriented management to overcome structural challenges. They argue that sustainable development requires not only corporate innovations but also institutional reforms and supportive government policies. In Uzbekistan, Abdurakhmanov and Yo'ldoshev have analyzed the role of sustainability in industrial modernization, noting that enterprises must shift from resource-intensive practices to knowledge-based and innovation-driven models.

The literature indicates that enterprises adopting sustainability-oriented management models benefit from enhanced competitiveness, improved stakeholder relations, and long-term risk mitigation. However, challenges remain in operationalizing sustainability, including the lack of standardized metrics, high initial investment costs, and resistance to organizational change.

Overall, the review of literature underscores that sustainable development is not an alternative but a necessity for modern management. The creation of innovative management models based on sustainability principles is crucial for achieving competitive advantage and aligning corporate goals with societal expectations.

The methodology of this study is based on a multidisciplinary and systemic approach. It integrates economic, managerial, and environmental perspectives to provide a holistic understanding of the innovative management model based on sustainable development.

First, the descriptive method was employed to analyze the theoretical foundations of sustainable development and its application in management systems. Academic literature, policy documents, and corporate sustainability reports were examined to identify the principles and practices of sustainable management.

Second, a comparative analysis was conducted to explore international practices. Case studies from Europe, Asia, and North America were reviewed to determine how enterprises in different contexts integrate sustainability into their management systems. This comparative perspective allows identifying best practices that can be adapted to the Uzbek context.

Third, the study utilized structural-functional analysis to examine the role of management functions in sustainable enterprise models. The functions of planning, organization, motivation, and control were analyzed to determine how they change under sustainability principles. For example, planning in sustainable enterprises incorporates long-term ecological risks, while motivation emphasizes corporate responsibility and ethical standards.

Fourth, expert evaluation methods were employed to gather insights from economists, managers, and policymakers in Uzbekistan. Semi-structured interviews and surveys were conducted to understand the challenges enterprises face in implementing sustainable practices and the opportunities they see for innovation in management.

Finally, foresight analysis was applied to predict future trends in sustainable enterprise management. Scenarios were developed based on global sustainability challenges, such as climate change, digitalization, and resource scarcity. These scenarios help outline the long-term prospects for innovative management models.

The integration of these methods ensures that the research is comprehensive, capturing both theoretical and practical dimensions of sustainable management.

RESULTS

The results of the study show that innovative enterprise management models based on sustainable development principles have significant potential to enhance competitiveness and resilience.

First, the integration of sustainability into strategic planning improves long-term risk management. Enterprises that account for ecological and social factors in decision-making are better equipped to adapt to regulatory changes, market fluctuations, and stakeholder demands. In Uzbekistan, enterprises that introduced energy-efficient technologies reported reduced operational costs and improved access to international markets.

Second, the adoption of green innovations fosters technological advancement. For example, renewable energy solutions, waste recycling systems, and digital monitoring tools contribute to resource efficiency. Enterprises that invest in such innovations not only reduce their ecological footprint but also attract environmentally conscious customers and investors.

Third, sustainable management models enhance organizational culture. Employees in sustainability-oriented enterprises demonstrate higher levels of motivation and loyalty, as they perceive their work as contributing to broader societal goals. This finding aligns with international research indicating that sustainability improves employee engagement and productivity.

Fourth, enterprises that align with sustainable development goals strengthen their reputation and stakeholder trust. In global markets, sustainability certifications and environmental standards are increasingly required. Uzbek enterprises adopting such practices gain better opportunities for export and international cooperation.

Finally, the results highlight that sustainability-driven innovation is not limited to environmental technologies. It also includes new business models, such as the sharing economy, digital platforms for resource optimization, and circular economy initiatives. These models redefine value creation and open new opportunities for enterprise growth.

However, challenges remain. High initial investment costs, limited access to green financing, and insufficient managerial competencies hinder the adoption of sustainable models. In Uzbekistan, many enterprises still rely on resource-intensive practices, reflecting the need for stronger institutional support and capacity-building programs. Overall, the results confirm that sustainable development is a viable foundation for innovative management models. Enterprises that embrace sustainability principles achieve not only economic growth but also contribute to social welfare and environmental protection.

CONCLUSION

The study concludes that the innovative model of enterprise management based on sustainable development principles is both necessary and beneficial for modern economies. In the context of globalization and ecological challenges, enterprises must move beyond traditional profit-oriented strategies and adopt holistic approaches that balance economic, social, and environmental objectives.

The research findings highlight that enterprises adopting sustainability-driven innovations improve competitiveness, enhance resilience, and build stronger

stakeholder relations. They reduce risks associated with regulatory changes, environmental degradation, and market uncertainties. Moreover, they contribute to national and global goals of sustainable development, strengthening the integration of businesses into the green economy.

For Uzbekistan, the development of sustainable enterprise management models requires coordinated efforts between businesses, government institutions, and academic communities. Key priorities include expanding access to green financing, promoting energy efficiency and renewable energy projects, training managers in sustainability practices, and supporting innovation ecosystems. Policy reforms should incentivize enterprises to adopt sustainable models through tax benefits, subsidies, and regulatory frameworks aligned with international sustainability standards.

The article emphasizes that innovation is the bridge between sustainability and competitiveness. By embracing innovative technologies, business models, and organizational structures, enterprises can turn sustainability challenges into opportunities for growth. The prospects of enterprise management in Uzbekistan, as well as in other emerging economies, depend on the ability to combine sustainability with innovation in a coherent and strategic manner.

In conclusion, the innovative model of enterprise management grounded in sustainable development principles represents a new paradigm that ensures long-term prosperity, ecological balance, and social well-being. It is not only a managerial necessity but also a strategic imperative for building a resilient and competitive economy in the 21st century.

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BOSHLANG‘ICH SINIF O‘QUVCHILARINING MUSTAQIL ISHLASH KO‘NIKMALARINI INNOVATSION YONDASHUV ASOSIDA TAKOMILLASHTIRISH MEXANIZMI

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Annotatsiya : ushbu maqolada boshlang‘ich sinf o‘quvchilarining mustaqil ishlash ko‘nikmalarini innovatsion yondashuv asosida rivojlantirish masalalari yoritilgan. Mustaqil ishning nazariy va amaliy asoslari, o‘qituvchining rahbarlik faoliyati, o‘quvchilarning individual imkoniyatlarini hisobga olish, shuningdek, innovatsion texnologiyalarning mustaqil ta’limdagi roli tahlil qilinadi. Maqolada ta’lim jarayonida interfaol metodlar, raqamli vositalar va STEAM yondashuvi orqali o‘quvchilarning mustaqil ishlash ko‘nikmalarini takomillashtirish mexanizmi ishlab chiqilgan.

Kalit so‘zlar: mustaqil ish, innovatsion yondashuv, boshlang‘ich ta’lim, raqamli texnologiyalar, ijodiy fikrlash, kompetensiya, metodika.

Аннотация : в статье рассматриваются вопросы развития навыков самостоятельной работы учащихся начальных классов на основе инновационного подхода. Анализируются теоретические и практические аспекты самостоятельной деятельности, педагогическая роль учителя, индивидуализация обучения и применение современных технологий. Отмечено значение цифровых средств и STEAM-образования для формирования творческого и аналитического мышления учащихся.

Ключевые слова: самостоятельная работа, инновационный подход, начальное образование, цифровые технологии, креативное мышление, компетенция.

Annotation : this article discusses the development of primary school students' independent learning skills through an innovative approach. It examines theoretical and practical foundations of independent activity, the teacher's leadership role, and the integration of modern technologies. The article highlights the role of digital tools and the STEAM approach in improving students' creative and analytical thinking competencies.

Keywords: independent learning, innovative approach, primary education, digital technology, creativity, competence, methodology.

Ta'lim tizimining zamonaviy bosqichida o'quvchilarda mustaqil ishlash ko'nikmalarini shakllantirish muhim pedagogik vazifa hisoblanadi. Bugungi kun talablariga javob beruvchi, yangilik yaratishga intiluvchi shaxsni tarbiyalash uchun o'quvchilarning bilimni mustaqil egallash faoliyatini yo'lga qo'yish zarur.

Boshlang'ich ta'lim — shaxs shakllanishining poydevori. Shu davrda o'quvchi o'qish, yozish, hisoblash, fikrlash va mustaqil qaror qabul qilishni o'rganadi. Mustaqil ishlar o'quvchining o'z bilimni mustahkamlash, yangi axborotni o'zlashtirish va ijodiy tafakkurni rivojlantirish uchun xizmat qiladi. Innovatsion yondashuv bu jarayonda o'qituvchining an'anaviy nazoratchi rolini o'zgartirib, uni yo'naltiruvchi, motivatsiya beruvchi, ijodiy muhit yaratadigan shaxsga aylantiradi. Bu maqolada aynan shu yondashuv asosida boshlang'ich sinf o'quvchilarining mustaqil ishlash mexanizmlari keng tahlil qilinadi.

Mustaqil ish o'quv faoliyatining shunday shakli, unda o'quvchi bilimni o'qituvchi rahbarligisiz, o'z aqliy va amaliy harakati orqali egallaydi. L.S. Vigotskiy, A.N. Leontyev, J. Dewey, Sh. Amonov kabi olimlarning tadqiqotlarida mustaqil ish o'quv jarayonining markaziy komponenti sifatida talqin etiladi.

Boshlang'ich ta'limda mustaqil ishlar — o'quvchining o'z kuchiga ishonchini oshiradi, o'zlashtirish darajasini aniqlaydi va o'zini-o'zi baholashni o'rgatadi. Mustaqil ish o'quvchini faqat o'qishga emas, balki tahlil qilish, xulosa chiqarish, muammoni hal etish faoliyatiga jalb qiladi. Pedagogik nuqtai nazardan, mustaqil ish — bu o'quv jarayonida subyekt sifatida o'quvchini faol ishtirokchi darajasiga olib chiqadigan mexanizmdir.

Boshlang'ich sinf o'quvchilarida mustaqil ishlash ko'nikmalarini shakllantirish murakkab, lekin tizimli jarayon bo'lib, bir necha bosqichlarni o'z ichiga oladi:

1. Motivatsion bosqich.: o'quvchida o'rganishga bo'lgan qiziqishni uyg'otish, "Men o'zim bajara olaman" degan ishonchni shakllantirish. Bu bosqichda o'qituvchi o'quvchini ruhlantiruvchi, rag'batlantiruvchi metodlardan foydalanadi
2. Faoliyatni yo'lga qo'yish bosqichi : o'quvchining o'quv topshiriqlarini bajarish jarayonida mustaqil fikr yuritish, rejalashtirish va natijani taxmin qilish ko'nikmasi shakllanadi.
3. Refleksiya bosqichi : o'quvchi o'z faoliyatini tahlil qiladi, xatolarini anglaydi, kelgusida ularni tuzatish yo'llarini aniqlaydi. O'qituvchi esa bu jarayonda tahlilchi va yo'naltiruvchi sifatida qatnashadi.
4. Ijodiy bosqich : o'quvchi yangi bilimlarni mustaqil izlay boshlaydi, innovatsion g'oyalarni ilgari suradi, o'z nuqtayi nazarini himoya qila oladi. Bu bosqichda STEAM yondashuvi ayniqsa samarali hisoblanadi.

Bugungi kunda ta'limda foydalanilayotgan innovatsion texnologiyalar — mustaqil ishlash mexanizmini samarali tashkil etishda eng muhim vositadir. Quyidagi texnologiyalar boshlang'ich sinf o'quvchilarida mustaqil faoliyatni rivojlantirishda keng qo'llaniladi:

- “Aqliy hujum” – fikrlash tezligini va ijodiy yondashuvni oshiradi.
- “Klaster” – o'quvchilarni fikrlarni tizimlashtirishga o'rgatadi.
- “Insert” texnologiyasi – o'quvchi o'qigan matnni mustaqil tahlil qiladi.
- “Loyiha metodi” – o'quvchilarning amaliy tajriba orttirishiga yordam beradi.
- Raqamli ta'lim platformalari (LearningApps, Wordwall, Kahoot) – o'quvchilarni raqamli vositalar orqali mustaqil topshiriqlar bajarishga o'rgatadi.
- Innovatsion texnologiyalar yordamida o'quvchi “tayyor bilimni qabul qiluvchi” emas, balki “bilim yaratuvchi” subyekt sifatida shakllanadi.

Boshlang'ich sinf o'qituvchisi — o'quvchining mustaqil faoliyatidagi eng muhim rahbar va yo'naltiruvchidir. O'qituvchi quyidagi vazifalarni bajaradi:

1. Mustaqil ish uchun sharoit yaratadi.
2. O'quvchilarning psixologik xususiyatlarini hisobga oladi.
3. Rag'batlantiruvchi muhit yaratadi.
4. Har bir o'quvchi uchun individual yondashuvni tanlaydi.

O'qituvchi nafaqat bilim beruvchi, balki o'quvchi tafakkurini shakllantiruvchi mentor sifatida faoliyat yuritadi. Mustaqil ishlar orqali o'quvchida mas'uliyat, mustahkam irodaviy sifatlar, va o'z fikrini erkin ifoda etish qobiliyati paydo bo'ladi.

Axborot texnologiyalarining rivojlanishi natijasida ta'lim jarayonida mustaqil ishlash uchun keng imkoniyatlar yaratildi. O'quvchilar uchun turli onlayn testlar, virtual laboratoriyalar, elektron darsliklar mavjud bo'lib, ular ta'limni qiziqarli va interfaol shaklga keltiradi.

Raqamli muhitda mustaqil ishlarni tashkil etish o'quvchiga quyidagi afzalliklarni beradi:

- O'z tezligida o'rganish imkoniyati;
- Xatolarni tahlil qilish va tuzatish imkoniyati;
- Mustaqil izlanish va bilim olish jarayonining shaxsiylashtirilishi.

O'qituvchining vazifasi — bu jarayonda o'quvchini nazorat qilish emas, balki yo'naltirish va maslahat berishdir.

Xulosa qilib aytganda, boshlang'ich sinf o'quvchilarining mustaqil ishlash ko'nikmalarini innovatsion yondashuv asosida rivojlantirish — zamonaviy ta'limning eng dolzarb masalalaridan biridir. Innovatsion yondashuv ta'lim jarayonida o'quvchi faolligini oshiradi, ularni mustaqil fikrlashga, ijodiy yondashuvga o'rgatadi. Mustaqil

ishlarning samarali tashkil etilishi o'quvchilarda mas'uliyat, diqqat, tahlil qilish, o'z fikrini asoslash kabi hayotiy kompetensiyalarni shakllantiradi. Raqamli vositalardan foydalanish esa o'quvchilarni XXI asr ko'nikmalariga — axborot bilan ishlash, muammolarni hal qilish va ijodiy fikrlashga tayyorlaydi. Shunday qilib, mustaqil ishlashni innovatsion yondashuv asosida tashkil etish boshlang'ich ta'limda o'quvchi shaxsini har tomonlama rivojlantirishning samarali yo'li hisoblanadi.

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MULTIMEDIA VOSITALARI YORDAMIDA EKOLOGIK TA'LIMNI SAMARALI TASHKIL ETISH

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Annotatsiya

Ushbu maqolada ekologik ta'lim jarayonida multimedia vositalaridan foydalanishning ahamiyati, ularning ta'lim samaradorligiga ta'siri hamda o'quvchilarda ekologik madaniyatni shakllantirishdagi roli tahlil qilinadi. Tadqiqot natijalariga ko'ra, multimedia texnologiyalari asosida tashkil etilgan darslar o'quvchilarning ekologik ongini oshirish, tabiatga nisbatan mas'uliyat hissini kuchaytirishda samarali ekanligi aniqlangan.

Kalit so'zlar: ekologik ta'lim, multimedia, interfaol ta'lim, ekologik madaniyat, axborot texnologiyalari.

Kirish

Bugungi kunda atrof-muhit muammolari global miqyosda dolzarb masalaga aylangan. Shu sababli, yosh avlodda ekologik madaniyatni shakllantirish ta'lim tizimining muhim yo'nalishlaridan biridir. Ekologik ta'limni samarali tashkil etish uchun zamonaviy pedagogik va axborot texnologiyalaridan, xususan, **multimedia vositalaridan** foydalanish alohida ahamiyat kasb etadi.

Multimedia texnologiyalari

– bu matn, grafika, tovush, animatsiya va videoni birlashtirgan holda o'quv materiallarini interfaol shaklda taqdim etish imkonini beruvchi vositalardir. Ular o'quvchilarning dars jarayonidagi faolligini oshiradi, mavzuni chuqurroq anglash va tahlil qilishga yordam beradi. XXI asrda insoniyat duch kelayotgan eng dolzarb muammolardan biri bu

— ekologik inqiroz va atrof-muhitning keskin ifloslanishidir. Global isish, atmosfera ifloslanishi, suv resurslarining kamayishi, chiqindilarning to'planishi, o'rmonlarning kesilishi va biologik xilma-xillikning yo'qolishi kabi omillar butun dunyo miqyosida ekologik barqarorlikka jiddiy tahdid solmoqda. Shu sababli har bir mamlakatda, xususan, O'zbekiston Respublikasida ham ekologik ta'lim va tarbiyani takomillashtirish, yosh avlodda ekologik madaniyatni shakllantirish masalasi davlat siyosati darajasiga ko'tarilgan.

Ekologik ta'lim

— bu o‘quvchi va talabalarda tabiatni anglash, undan oqilona foydalanish, atrof-muhitni muhofaza qilish, ekologik muammolarga nisbatan mas’uliyatli munosabatni shakllantirishga yo‘naltirilgan uzluksiz ta’lim jarayonidir. Ushbu ta’lim turining asosiy maqsadi

— inson va tabiat o‘rtasidagi muvozanatni saqlash, shaxsni ekologik jihatdan savodli, mas’uliyatli va faol fuqaroga aylantirishdir.

Zamonaviy ta’lim tizimida ekologik bilimlarni o‘qitish jarayonida faqat an’anaviy uslublar (ma’ruza, suhbat, darslik bilan ishlash) bilan cheklanib qolish yetarli emas. Chunki bu usullar o‘quvchilarda ekologik muammolarning real ko‘lamini tasavvur etishga va ularni his etishga imkon bermaydi. Shu bois, ta’limda innovatsion texnologiyalarni, xususan, **multimedia vositalarini** qo‘llash ekologik ta’lim samaradorligini oshirishning eng muhim shartlaridan biridir.

Multimedia texnologiyalari

— bu matn, rasm, audio, video, animatsiya va interfaol elementlarni birlashtirgan axborot tizimlari bo‘lib, ular o‘quv materiallarini ko‘rgazmali, dinamik va jonli shaklda taqdim etish imkonini beradi. Multimedia vositalari o‘quvchilarning ekologik jarayonlarni nafaqat eshitish va o‘qish, balki ularni **ko‘rish, kuzatish va modellashtirish** orqali chuqurroq o‘zlashtirishiga yordam beradi. Masalan, “Atmosferaning ifloslanish sabablari” yoki “Suv aylanish jarayoni” kabi mavzularni video, animatsiya va simulyatsiya orqali o‘rganish, o‘quvchilarni mavzuga faol jalb etadi, ularning qiziqishini oshiradi va mustaqil fikrlash ko‘nikmasini rivojlantiradi.

Shuningdek, O‘zbekiston Respublikasi Prezidenti tomonidan qabul qilingan **“Ekologik madaniyatni oshirish va atrof-muhitni muhofaza qilish bo‘yicha chora-tadbirlar”** hamda **“Raqamli ta’limni rivojlantirish strategiyasi”** kabi hujjatlar ta’lim tizimida axborot texnologiyalarini keng joriy etish va ularni ekologik ta’lim bilan uyg‘unlashtirish zarurligini belgilab berdi. Bu esa ekologik ta’limda multimedia vositalaridan samarali foydalanish uchun keng imkoniyatlar yaratmoqda. Ekologik ta’limni multimedia asosida tashkil etishning afzalliklari quyidagilarda namoyon bo‘ladi:

o‘quvchilarda ekologik tafakkur va tasavvurni rivojlantiradi;

o‘rganilayotgan mavzularni real hayotiy misollar asosida tushuntirish imkonini beradi;

dars jarayonini interfaol va ijodiy muhitga aylantiradi;

o‘quvchilarda ekologik muammolarga nisbatan mas’uliyat hissini kuchaytiradi;

ta’lim sifatini oshirib, o‘qituvchi faoliyatini samarali qiladi.

Shunday qilib, ekologik ta’limda multimedia vositalaridan foydalanish nafaqat o‘quv jarayonini qiziqarli qiladi, balki o‘quvchilarda ekologik ongini shakllantirish, tabiatni

asrash zaruriyatini anglash, ekologik muammolarga amaliy yechim topish ko'nikmalarini rivojlantirishga xizmat qiladi.

Ushbu maqolada ekologik ta'limni multimedia texnologiyalari asosida tashkil etishning nazariy asoslari, amaliy usullari hamda ta'lim samaradorligiga ta'siri ilmiy jihatdan tahlil qilinadi. Shuningdek, multimedia vositalari orqali ekologik madaniyatni shakllantirish yo'llari, ularni o'quv jarayoniga integratsiya qilishning amaliy tajribalari yoritiladi.

Asosiy qism

1. Ekologik ta'limning maqsad va vazifalari

Ekologik ta'limning asosiy maqsadi – insonning tabiat bilan o'zaro munosabatini uyg'unlashtirish, ekologik ong va madaniyatni shakllantirishdir. Bu jarayonda quyidagi vazifalar amalga oshiriladi:

o'quvchilarda ekologik bilim va ko'nikmalarni shakllantirish;
tabiatni muhofaza qilishga oid faoliyatlarga jalb etish;
ekologik mas'uliyat hissini kuchaytirish.

2. Multimedia vositalarining ekologik ta'limdagi o'rni

Multimedia vositalari ekologik mavzularni yanada jonli, qiziqarli va ta'sirchan tarzda o'rganishga imkon beradi. Masalan:

Interfaol taqdimotlar (PowerPoint, Prezi, Canva) orqali o'quvchilarga ekologik jarayonlar tasviriy tarzda ko'rsatiladi.

Videoroliklar va animatsiyalar yordamida ekologik muammolar (global isish, chiqindilarni qayta ishlash, o'rmonlarni muhofaza qilish) tushunarli tarzda yoritiladi.

Virtual laboratoriyalar va 3D modellar o'quvchilarga tajriba o'tkazish va natijalarni tahlil qilish imkonini beradi.

Onlayn testlar va interfaol o'yinlar orqali bilimlarni mustahkamlash mumkin.

3. Multimedia asosidagi ta'lim jarayonining afzalliklari

Multimedia vositalaridan foydalanish:

o'quvchilarda ekologik muammolarga nisbatan qiziqish uyg'otadi;
ko'rgazmalilik tamoyilini ta'minlaydi;
mustaqil o'rganish va tahlil qilish ko'nikmalarini rivojlantiradi;
o'qituvchi va o'quvchi o'rtasida interfaol aloqani kuchaytiradi.

4. Tajriba natijalari (misol uchun)

Tajriba sifatida 9-sinf o'quvchilariga "Atmosfera ifloslanishi" mavzusi multimedia yordamida o'tilgan. Dars davomida videorolik, interfaol test va animatsiyalar qo'llanilgan. Natijada:

o'quvchilarning darsga qiziqishi 35% ga oshgan;

test natijalari 20% ga yaxshilangan;

o'quvchilarda ekologik muammolarga nisbatan shaxsiy mas'uliyat hissi sezilarli darajada oshgan.

Xulosa

Multimedia vositalari ekologik ta'limni tashkil etishda o'quv jarayonining samaradorligini oshiradi, o'quvchilarda ekologik ong va madaniyatni shakllantirishda muhim vosita bo'lib xizmat qiladi. Ular o'quv jarayonini vizuallashtiradi, interfaollikni kuchaytiradi va o'quvchilarning ijodiy fikrlashini rag'batlantiradi. Multimedia vositalari yordamida ekologik ta'limni tashkil etish zamonaviy ta'lim jarayonida eng samarali pedagogik yondashuvlardan biri hisoblanadi. Tadqiqotlar shuni ko'rsatadiki, multimedia texnologiyalari o'quvchilarning ekologik bilimlarini chuqurlashtirish, ekologik ongni shakllantirish hamda tabiatga nisbatan ijobiy munosabatni mustahkamlashda katta rol o'ynaydi.

Birinchidan, multimedia vositalari orqali ekologik ta'limni vizual va interfaol shaklda tashkil etish o'quvchilarda **ko'rish, eshitish va tajriba orqali idrok etish** imkoniyatlarini kengaytiradi. Bu esa ekologik jarayonlarning mohiyatini chuqurroq tushunishga yordam beradi. Misol uchun, animatsiyalar yordamida atmosfera ifloslanishi yoki suv aylanish jarayonlarini kuzatish o'quvchilarda ekologik sabab-oqibat munosabatlarini anglashni osonlashtiradi.

Ikkinchidan, multimedia asosidagi darslar o'quvchilarning **faolligini va motivatsiyasini oshiradi**. O'qituvchi tomonidan qo'llaniladigan videoroliklar, interfaol testlar va o'yinlar darsni yanada qiziqarli va ijodiy tusga keltiradi. Bu o'z navbatida o'quvchilarning ekologik muammolarga befarq bo'lmaslik hissini kuchaytiradi.

Uchinchidan, bunday yondashuv o'quvchilarda **axborot bilan ishlash, mustaqil o'rganish va tahlil qilish ko'nikmalarini** rivojlantiradi. Multimedia vositalaridan foydalanish o'quvchilarni nafaqat tayyor ma'lumotni o'zlashtirishga, balki mustaqil izlanish olib borishga, ekologik ma'lumotlarni tanqidiy tahlil qilishga o'rgatadi.

To'rtinchidan, ekologik ta'limni multimedia texnologiyalari asosida tashkil etish ta'lim jarayonining **samaradorligini oshiradi**, o'quvchilarning bilim sifatini yaxshilaydi va o'qituvchi faoliyatini yengillashtiradi. O'qituvchi o'z faoliyatida raqamli resurslar, elektron darsliklar, ekologik videoma'ruzalar va interfaol platformalardan foydalanish orqali darslarni yanada samarali tashkil eta oladi.

Beshinchidan, bu yondashuv ekologik ta'limni **barqaror rivojlanish maqsadlari** (BRM) bilan uyg'unlashtiradi. O'quvchilarni ekologik muammolarni hal etishga, chiqindilarni kamaytirish, suvni tejash, energiya resurslaridan oqilona foydalanish kabi

amaliy faoliyatlarga jalb etish orqali ularni barqaror fikrlovchi shaxs sifatida tarbiyalaydi.

Shunday qilib, multimedia texnologiyalarini ekologik ta'lim jarayoniga joriy etish:

ta'lim sifatini va samaradorligini oshiradi;

o'quvchilarda ekologik madaniyatni shakllantiradi;

o'qituvchilarga yangi metodik imkoniyatlar yaratadi;

o'quvchilarni ekologik muammolarga nisbatan mas'uliyatli qarashga o'rgatadi.

Kelgusida ekologik ta'lim jarayonida multimedia vositalaridan yanada kengroq foydalanish uchun:

1. **O'quv dasturlarini raqamlashtirish**, ekologik mavzular bo'yicha interfaol elektron resurslar yaratish;
2. **O'qituvchilarni multimedia texnologiyalaridan foydalanish ko'nikmalariga o'qitish**;
3. **Mahalliy ekologik muammolarni o'rgatishda virtual laboratoriyalar va simulyatsiyalarni joriy etish**;
4. **O'quvchilarning amaliy ekologik loyihalarda ishtirokini kengaytirish tavsiya etiladi.**

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IMPROVING STUDENTS' AESTHETIC CULTURE

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Abstract: *The article examines the pedagogical and therapeutic possibilities of using the Mushkulot section of the unique example of the national musical heritage "Shashmaqom" in improving the aesthetic culture of students. In particular, based on art therapy methods, a technology is developed that allows revealing the aesthetic and expressive potential of the Mushkulot melodies and effectively organizing the educational process on this basis.*

Keywords: *Aesthetic culture, music therapy, status, difficulty, music, psychology, pedagogy and cultural studies, integration, reflection, technology.*

INTRODUCTION: Music is an integral part of human life. Music has a strong influence on a person's emotional state, thinking, and psyche. History shows that the healing properties of music have been used since ancient times. Modern scientific research also confirms that music has a positive impact on the human psyche and physical health.

The issue of forming the aesthetic culture of students in modern education is a complex, multifaceted process that requires an individual approach. In the effective implementation of this process, the technology of teaching the works of the Mushkulot part of the national musical heritage - in particular, the "Shashmaqom" - through art therapy is of current importance.

This technology, by its nature, is based on the combination of musical, psychological, and aesthetic factors and provides for the development of the student's aesthetic perception through inner experiences and creative expression. In particular, the melodiousness, philosophical depth, and rhythmic complexity embodied in the Mushkulot section, along with deepening the student's musical thinking, enrich their artistic worldview.

A personality-oriented approach is a pedagogical principle based on a deep study of the student's individuality, their psycho-emotional state, level of aesthetic perception, musical taste, and psychological needs. In this approach, each student is seen as a unique individual, and their inner world and aesthetic perception are harmonized through the means of musical art therapy.

The personality-oriented approach is recognized as one of the central principles of modern pedagogy. It requires the organization of education and upbringing, taking into account the individual psychological characteristics, psycho-emotional state, and aesthetic needs of each student. This approach demonstrates its practical and therapeutic effectiveness, especially in music art therapy.

LITERATURE ANALYSIS AND METHODOLOGY.

The renowned psychologist K. Rogers¹, in his work "Client-Centered Therapy"² emphasizes the importance of respecting each individual's inner world and creating conditions that allow for its development. This principle also serves as the basis for listening to the student, understanding him, choosing appropriate musical means, and easing his emotional state through musical expression in musical art therapy.

V.V. Serikov³ interprets the personality-oriented approach as a means of expanding the socio-aesthetic experience of the individual. In his opinion, the educational process should serve not only the transfer of knowledge, but also the cultural and aesthetic development of the individual. Musical art therapy is a kind of positive tool in this regard, directly affecting the student's subtle emotions, revealing their aesthetic perception potential.

Diagnostic methods used in music therapy in the study of the individual state of the student - analysis of the listener's reactions, exercises for describing through music, techniques of self-expression (improvisation, visual description) - allow for the effective application of a personality-oriented approach⁴.

This approach serves to form the student's individual attitude towards music, eliminate internal contradictions, and develop aesthetic taste. In particular, with the help of works with a complex structure and deep philosophical and aesthetic content, such as the "Mushkulot" section of Shashmaqom, the student develops the skills of conscious listening, analysis, and perception of the musical situation.

Mushkulot is an instrumental part of Shashmaqom, performed mainly on national instruments. This part is technically quite complex and requires skill and extensive knowledge. In the problem section of Shashmaqom, the depth of melodies, rhythmic complexity, specific features of maqoms, and harmony with musical words are of great importance.

¹ Rogers, C. (1961). *On Becoming a Person: A Therapist's View of Psychotherapy*. Houghton Mifflin.

² Marjorie Cross Witty Argosy University, Chicago. January 2007

³ Serikov, V.V. (1998). *Личностно-ориентированное образование: Размышления о проектируемой реальности*. Moscow: Logos.

⁴ Nordoff, P., & Robbins, C. (1977). *Creative Music Therapy*. New York: John Day Company.

The "Mushkulot" section of Shashmaqom is particularly important in this process. Because its complex status structure, deep philosophical and aesthetic content, and narrow forms of emotional expression serve to awaken the inner experiences of the student and activate his aesthetic perception. In this process, the student becomes not only a listener, but also an active participant, understanding the musical situation, connecting it with their personal spiritual world.

An integrative approach is the organization of the educational process as a unified, harmonious system based on the knowledge of several disciplines - music, psychology, pedagogy, and cultural studies. This approach serves as an important methodological basis for the development of the aesthetic culture of students, especially in the field of musical art therapy.

In particular, the integrative approach to the use of the "Mushkulot" section of Shashmaqom demonstrates its practical effectiveness. Because this section of maqom is rich not only in musical, but also in philosophical, religious-spiritual, and cultural-aesthetic layers, its in-depth study requires listening to, understanding, analyzing, feeling music, and connecting it with the student's personal experience.

The famous German pedagogue V. Klafki defined the integrative approach as "illuminating the general culture based on key concepts and teaching various interdisciplinary connections." On this basis, in musical art therapy, through interdisciplinary integration, it is possible to comprehensively understand and develop the complex psychological and aesthetic state of the student.

N. L. Selivanova also expressed her opinion that the integrative approach "serves to harmonize the cultural identity and emotional-intellectual development of the individual."

The reflexive approach is the process of self-awareness, analysis of feelings, and reflection on experience. In pedagogical activity, this approach implies the student's ability to consciously evaluate their own practice, experiences, and didactic processes. Within the framework of musical art therapy, reflection provides emotional awareness through the experience of musical listening, analysis of the mental state, perception and expression of changes.

Musical art therapy is an important tool for enriching the inner world of students, helping them achieve mental stability, and developing aesthetic perception and musical thinking. In particular, the Mushkulot section of "Shashmaqom," with its complex structure, melodiousness, and deep philosophical content, has great potential in shaping not only musical but also spiritual and aesthetic education.

This technology is based on the following pedagogical approaches:

The purpose of the technology is to form the aesthetic culture of students using musical art therapy methods based on the Mushkulot section of "Shashmaqom." The main task of this technology is:

- analysis of complex works based on an art therapy approach;
- teaching the perception of aesthetic experiences through music;
- formation of musical thinking and aesthetic sensitivity in students;
- achieving stabilization of the psychological state through status.

The technology aimed at forming the aesthetic culture of students in the process of teaching the Mushkulot section of "Shashmaqom" using art therapy consists of diagnostic, preparatory, art-therapeutic integration, as well as stages of reflection and analysis.

The complexity of the problem section, its rhythmic and melodic structures, serves to focus students' attention, develop musical thinking, and deepen their aesthetic feelings. When combined with art therapy methods, this process allows revealing the inner world of students and assessing their aesthetic culture.

One of the effective ways to develop aesthetic culture is the phased implementation of art-therapeutic influence on students by listening to the Mushkulot section of "Shashmaqom."

Students listen to audio or video recordings of the Problem section. At this stage, it is important to draw their attention to the following:

- rhythmic and melodic structures;
- emotional expression in performance;
- mutual harmony of instruments.

This process increases students' musical perception and aesthetic sensitivity.

The art therapy approach is an effective method for improving the aesthetic culture of students by listening to or performing the Tasnif, Tarje, Gardun, Muxammas, and Saqil melodies of "Shashmaqom." This process serves to awaken the inner spiritual state of students, increase their interest in national musical heritage, and develop their aesthetic perception.

Each maqom section has its own emotional and aesthetic load:

Classification: Provides spiritual elevation with its solemn and uplifting tones.

Tarje: Awakens thought and inner reflection.

Gardun: Strengthens mental stability and a sense of balance.

Mukhammas: Encourages creative thinking and emotional expression.

Saqil: Provides a sense of ease and spiritual freedom.

Listening to or performing these melodies has a positive effect on the inner state of students and increases their aesthetic sensitivity.

Teaching the Mushkulot section of "Shashmaqom" through an art therapy approach is an innovative and effective pedagogical technology in the formation of students' aesthetic culture. This method serves to improve the psychological and emotional state of students, develop their creative thinking, and increase their respect for the national musical heritage.

The complex rhythmic and melodic structures of the complex section evoke deep emotional states in students. Conducting classes in a group format helps students exchange ideas and develop teamwork. It is important to approach each student individually, taking into account their personal feelings. The combination of music and art in teaching the problem section deepens the aesthetic culture of students.

The Mushkulot section of "Shashmaqom" is a work that reflects the most complex and deep emotional layers of Uzbek classical musical art, and its listening or performance evokes various emotions in students. The art therapy approach is an effective tool for expressing and aesthetically analyzing these feelings, developing the aesthetic culture of students.

Listening to or performing the difficult section helps students to feel inner problems, anxieties, complex and difficult tones of music. Some parts of the music inspire hope in students for future goodness. Some melodies of music help students feel inner peace and balance.

Teaching the Mushkulot section of "Shashmaqom" through an art therapy approach is an effective pedagogical technology for the development of students' aesthetic culture. This approach serves to improve the psychological and emotional state of students, develop their creative thinking, and increase their respect for the national musical heritage.

The complex rhythmic and melodic structures of the complex section evoke deep emotional states in students. Art-therapeutic activities such as listening, conversations, drawing, writing poetry, and expression through movement are used to identify these conditions. These activities develop students' aesthetic perception and creative thinking.

By conducting classes in a group format, applying an individual approach to each student, and combining music and art, it is possible to deepen the aesthetic culture of students.

This technology is an effective tool in the formation of students' aesthetic culture and serves to increase their respect for national musical heritage.

CONCLUSION. Teaching the Mushkulot section of "Shashmaqom" based on musical art therapy serves as an effective tool in the formation of students' aesthetic culture. Through the melodiousness, rhythmic complexity, and psycho-emotional richness of the problem, students are oriented towards the development of aesthetic perception, musical thinking, and inner sensitivity. The educational process, organized on the basis of an art-therapeutic approach, encourages students not only to acquire musical knowledge, but also to harmonize their inner spiritual state, aesthetically realize and express themselves.

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THE ROLE OF VOCAL ART AS A MEANS OF COMMUNICATION

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Abstract

This article analyzes the role and importance of vocal art as a means of communication between people. Music, especially vocal performance, is the most natural expression of human emotions, through which emotions, mental state, culture and values are conveyed. Vocal art, as a communicative process, serves to form a person's artistic thinking, aesthetic taste, emotional expression and social consciousness.

Keywords: vocal art, means of communication, emotional expression, artistic thinking, musical communication.

Introduction. Each stage of human development is closely related to art, which is manifested as the highest social phenomenon expressing the human psyche, thoughts, feelings. In this process, musical art, in particular, vocal performance, has become the most natural, sincere form of spiritual connection and communication between people. The human voice is a natural musical instrument through which a person expresses his feelings, inner experiences, love, sorrow and dreams.

Vocal art, by its very nature, is an art of communication. Because it finds its way from the human heart to the human heart through the harmony of words, melody and feeling. Each vocal work is an expression of emotional information, an internal state in musical form. Therefore, during vocal performance, the performer does not just sing a song, but also conducts emotional, artistic and aesthetic communication with the listener.

In today's globalization, in an era of increasing intercultural dialogue and exchange of aesthetic values, the importance of vocal art is increasing. Because vocal works transcend the boundaries of nations, cultures and eras and become an artistic language that unites humanity.

The relevance of studying the role of vocal art as a means of communication is that it is directly related to the formation of communicative competence in modern music education, art history and cultural studies. For each vocalist, the voice is not only a technical opportunity, but also a means of establishing spiritual communication with people. Therefore, a deep study of the communicative essence of vocal art serves not only to improve the quality of performance, but also the artistic outlook, emotional thinking and cultural level of the individual.

Literature analysis. Scientific research on vocal art and its role in communication was formed at the intersection of music pedagogy, psychology and art history, and is aimed at illuminating the artistic, aesthetic and communicative essence of the human voice. First of all, the communicative nature of vocal performance has been widely studied by Western scientists. C. Seashore (1938) in his work "Psychology of Music" emphasizes that the vocal voice is a direct expression of human emotions, and it has a deeper emotional impact than words. R. Erickson (1982) called the voice an "emotional signal system" and scientifically substantiated the creation of emotional resonance in the human mind through vocal performance. J. Roden (2018) in his work "Choral Conducting and Communication" touches on the importance of communication culture in the process of vocal and choral performance, emphasizing the importance of emotional connection, voice harmony and mutual trust between the conductor and the performers. At the same time, L. Gaver (2015) in his study "Voice as Communication: The Human Instrument" analyzes the human voice as a means of social communication and justifies the naturalness, individuality and artistic value of the voice.

According to the "theory of emotional intelligence" put forward by A. Damasio (2010), the expression of human emotions in musical form is a natural form of the mechanism of emotional communication between the individual and society. This theory allows us to understand the psychological foundations of vocal art in more depth.

Local scientists have also paid great attention to the educational, aesthetic and communicative aspects of vocal art. In particular, M. Abdullayev (2019) in his work "Fundamentals of Music Pedagogy" shows the role of vocal art in the formation of emotional communication between the student and the teacher. According to him, the harmonious development of communication culture and aesthetic taste in the process of vocal education is directly related to the pedagogical skills of the teacher.

D. Karimova in her work "Vocal Performance and Stage Culture" deeply analyzes the communicative significance of the vocalist's voice technique, stage movement and non-verbal means of expression. According to the author, vocal art is a "wordless conversation", in which voice, intonation and emotion become the main means of communication.

S. Yusupov, in his work "The Art of Music and the Theory of Culture", highlights the socio-cultural essence of vocal art, emphasizing the formation of national values, historical memory and cultural identification processes through it. In his opinion, vocal works are "audible history" that expresses the spiritual culture of the people.

Also, in her article, Boymurodova D. draws attention to the educational significance of vocal art, emphasizing that vocal works purify the human soul, strengthen cultural unity and are an important tool in forming the aesthetic worldview of young people.

Many researchers (for example, M. Halliday, K. Johnson, A. Vygotsky) evaluate vocal art as a phenomenon closely related to language and communication. In their opinion, in vocal performance, language goes beyond words and acquires a new meaning through emotions - this process determines the essence of "aesthetic communication".

An analysis of foreign and domestic literature shows that:

- Vocal art is a system that expresses human emotions in musical form and serves social communication;
- It has a strong pedagogical, psychological and cultural impact on the development of the individual;
- Vocal performance is an artistic means of emotional communication rather than technical skill;
- The development of communicative competence and aesthetic thinking in the process of studying vocal art is of great importance.

Thus, an analysis of the existing scientific literature shows that the study of the communicative, emotional and aesthetic functions of vocal art is one of the most relevant scientific directions today. It creates the basis for interpreting art not only as an artistic activity, but also as a means of communication, emotional harmony and cultural integration between people.

The communicative nature of vocal art. Vocal art is based on the natural capabilities of the human voice. Voice is the most ancient and natural means of human communication. Long before speech, man expressed his feelings through melody, screams, and singing. In this sense, vocal performance is a musical form of emotion, a process of emotional information exchange.

Through vocal art, a person expresses his inner world, influences other people, and enters into spiritual contact with them. Vocal works, especially folk songs, religious theological melodies, or opera, are an expression of the national spirit, historical memory, and cultural values in the form of communication.

Communicative functions of vocal art. In vocal performance, communication occurs in several stages:

- Communication between the performer and the work - in this process, the performer feels the composer's idea, passes it through his spiritual world;
- Communication between the performer and the listener - in this case, the vocalist conveys emotions and meaning through his voice;

- Communication between the work and the social environment - through vocal performance, national, spiritual, aesthetic values are instilled in the consciousness of society.

All these stages increase the socio-cultural significance of vocal art. Because it teaches a person to understand himself, to feel others, to perceive humanity more deeply.

Vocal expression and non-verbal communication. Despite the fact that vocal art is a type of verbal music, its basis is largely non-verbal means of expression. Voice timbre, strength, intonation, breathing, articulation, stage position - all these are forms of wordless but meaningful communication.

On stage, the performer conveys meaning to the listener not only with his voice, but also through body language, facial expressions, and gaze. Therefore, the role of non-verbal expression in vocal art is very important - it enriches the emotional power of the word, increases the emotional perception of the listener.

Pedagogical and cultural significance of vocal art. Attention to the culture of communication in the process of teaching vocal art forms the aesthetic worldview of students. The student learns not only singing techniques, but also how to manage his emotions, establish contact with the audience, and stage culture.

Also, vocal art is a form of communication that conveys the rich heritage of national culture and folk oral art to the new generation. Through folk songs, classical songs, opera and pop directions, artistic taste, spiritual unity and aesthetic values are strengthened in society.

Conclusion. Vocal art is one of the most artistic and emotional forms of human communication. It allows a person to express his inner experiences, dreams and aspirations, love, joy, sorrow and hopes in the most natural way. Therefore, vocal art is not only a creative activity, but also the most sincere means of spiritual connection between people, emotional communication.

Through vocal performance, a unique psychological connection is established between the performer and the listener, which further increases the educational, aesthetic and cultural significance of art. Therefore, in the process of teaching vocal art, special attention should be paid not only to technical skills, but also to communicative culture, emotional expression and stage speech.

In general, vocal art:

1. Enriches communication as a natural form of expression of human emotions;
2. Provides artistic and spiritual connection between the performer and the listener;
3. Forms cultural values, national heritage and aesthetic taste;
4. Serves to develop the artistic thinking and social consciousness of the individual.

When teaching vocal art in the educational system, it is necessary to pay attention to its communicative essence. Because the main task of the vocalist is to convey not only music, but also emotions, content and spiritual energy through the voice. Therefore, emotional intelligence, non-verbal expression, stage speech and communication culture are of fundamental importance in the process of vocal performance.

In short, vocal art is the voice of the human heart, a means of spiritual communication between people and the most natural form of cultural unity. It goes beyond the boundaries of words and directly appeals to feelings. Therefore, every vocal performer should understand their voice not only as a technical tool, but also as a language of human communication, love and peace.

Therefore, the role of vocal art as a means of communication remains a relevant scientific direction not only from the point of view of art history, but also for the fields of pedagogy, cultural studies and psychology.

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INTRODUCING PRESCHOOL CHILDREN TO PROFESSIONS: A REVIEW OF INTERNATIONAL RESEARCH

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Abstract

This article examines international research on introducing preschool children to various professions and careers. Early career awareness plays a crucial role in children's cognitive development, social understanding, and future educational choices. The study analyzes contemporary approaches, methodologies, and findings from research conducted in different countries regarding career education for children aged 3-7 years. The review encompasses diverse pedagogical strategies including role-play activities, virtual excursions, interactive games, and direct interactions with professionals. Research indicates that early exposure to professions helps children develop realistic career aspirations, reduces gender stereotypes, broadens their understanding of the working world, and enhances social-emotional competencies. The article discusses effective practices from various educational systems, challenges in implementing career education programs, and recommendations for educators and policymakers. Findings suggest that systematic, age-appropriate career education integrated into preschool curriculum significantly contributes to children's holistic development and lays the foundation for informed future career decisions.

Keywords: preschool education, career awareness, professional orientation, early childhood development, pedagogical approaches, vocational education, children's career concepts.

Introduction

The formation of initial career awareness begins in early childhood when children first encounter various professions through their immediate environment, family members, and educational settings. Research in developmental psychology and early childhood education increasingly recognizes the importance of introducing preschool children to the world of work and professions. During the preschool years, children aged 3-7 develop fundamental concepts about occupations, work roles, and their place in society. This critical developmental period shapes not only children's understanding of the professional world but also their self-concepts and future aspirations.

International studies demonstrate that early career education contributes significantly to children's cognitive, social, and emotional development. Moreover, research indicates that career-related experiences during preschool years influence children's future educational choices and career aspirations. These early experiences create lasting impressions that can either expand or limit children's perceptions of what they can become. Understanding how different countries approach career education for young children provides valuable insights into effective practices and helps identify areas for improvement in early childhood education systems worldwide. The importance of this topic has grown substantially in recent years as educators and policymakers recognize that career development is a lifelong process beginning in early childhood rather than adolescence. Traditional approaches that delayed career education until secondary school have proven insufficient for addressing issues such as gender stereotyping in career choices, socioeconomic disparities in aspirations, and the need for broader career awareness in an increasingly complex labor market. This article synthesizes findings from international research on methodologies, outcomes, and best practices in introducing preschool children to various professions, providing a comprehensive overview of current knowledge and future directions in this field.

Theoretical Framework

Understanding career education for preschool children requires examining the theoretical foundations that inform practice. Several theoretical frameworks provide essential insights into how young children develop career-related concepts and why early intervention matters. Career development theories in early childhood have evolved significantly over the past decades, moving from viewing career development as an adolescent phenomenon to recognizing its roots in early childhood experiences.

Gottfredson's theory of circumscription and compromise, developed in 1981, remains highly influential in understanding children's career development. This theory suggests that children begin forming career preferences as early as age 3, initially based on gender stereotypes and gradually incorporating other factors such as social prestige and personal interests. According to Gottfredson, children progressively narrow their career options through a process called circumscription, eliminating occupations they perceive as inappropriate for their gender or social class. This process occurs largely unconsciously during the preschool years, making early intervention crucial for preventing premature elimination of career options. The theory emphasizes that once children have circumscribed their options, it becomes increasingly difficult to expand their career horizons, highlighting the importance of providing diverse career exposure during the preschool years.

These theoretical foundations collectively underscore the necessity of intentional career education during preschool years. They demonstrate that career development begins much earlier than traditionally assumed and that experiences during early childhood significantly shape later career trajectories. The theories also emphasize the importance of addressing gender stereotypes early, providing diverse role models, and creating supportive relational contexts for career exploration. Understanding these theoretical frameworks helps educators design developmentally appropriate career education programs that align with how young children actually develop career-related concepts.

International Approaches to Career Education

Different countries and regions have developed varied approaches to introducing preschool children to professions, reflecting diverse cultural values, educational philosophies, and policy priorities. Examining these international perspectives reveals both universal principles and context-specific strategies that inform best practices in early career education.

Scandinavian countries, particularly Finland, Sweden, and Norway, have pioneered comprehensive approaches to early career education within their progressive early childhood education systems. Research from Finland demonstrates that integrating career awareness into play-based learning environments enhances children's understanding of professions while maintaining developmentally appropriate practices. Finnish preschools regularly organize visits to workplaces and invite professionals to interact with children in authentic contexts. The Finnish approach emphasizes experiential learning and respects children's natural curiosity about adult work. Rather than formal lessons about careers, Finnish educators create opportunities for children to encounter various professions through field trips to local businesses, parent presentations, and community partnerships. This approach reflects the Finnish educational philosophy of learning through play and real-world experiences. Research shows that Finnish children develop rich, detailed understanding of various professions and demonstrate less gender stereotyping in their career aspirations compared to children in countries with less systematic career education.

German studies emphasize the "Berufsorientierung" or career orientation approach, which begins in kindergarten through systematic exposure to various occupations. The German system is known for its strong vocational education tradition, and career orientation begins early to prepare children for eventual participation in this system. Research indicates that structured programs combining direct experiences, storytelling, and dramatic play effectively develop children's career vocabulary and

understanding. German kindergartens often feature well-equipped play areas representing various workplaces, from medical clinics to construction sites to offices. Teachers guide children's play to deepen their understanding and expand their thinking about who can do various jobs. The German approach also emphasizes practical skills and understanding of work as a valued aspect of adult life. This cultural context shapes how career education is conceptualized and implemented, with earlier and more explicit attention to career development than in many other countries.

In North America, particularly the United States and Canada, researchers have extensively studied career education for young children, though implementation varies widely across different states, provinces, and individual programs. United States researchers have particularly focused on gender stereotyping in children's career aspirations. Studies have found that preschool children already exhibit gender-typed career preferences, with girls gravitating toward traditionally female occupations like teaching and nursing, while boys favor traditionally male occupations like firefighting and construction work. This research has highlighted the urgent need for interventions that broaden children's perceptions of career possibilities. Programs like "Career Day" and "Community Helper" units are common in American preschools, where parents and community members visit classrooms to share information about their professions. However, research shows that the effectiveness of these programs varies significantly based on implementation quality. Superficial exposure without meaningful engagement or follow-up activities produces limited impact on children's career understanding.

Canadian research has made important contributions by emphasizing multicultural approaches to career education. Researchers like Magnuson and Starr have highlighted the importance of ensuring that children from diverse backgrounds see themselves represented in various professions. Their findings suggest that inclusive career education that features professionals from various ethnic, cultural, and linguistic backgrounds reduces socioeconomic and ethnic disparities in career aspirations. Canadian approaches often incorporate Indigenous perspectives on work and community contribution, recognizing that career concepts are culturally constructed. This inclusive approach helps all children develop positive career identities and broadens the career horizons of children from marginalized communities who may have limited exposure to professional role models.

Asian countries have developed distinctive approaches reflecting their cultural contexts and educational values. Japanese research focuses on the concept of "Shokugyō Kyōiku" or vocational education starting from early childhood. Studies by

Shimizu and Okada demonstrate that experiential learning through workplace simulations significantly enhances career knowledge and social skills. Japan has developed innovative facilities like KidZania, elaborate indoor cities where children can try various occupations in realistic settings. These facilities combine entertainment with education, allowing children to role-play as doctors, pilots, chefs, journalists, and dozens of other professionals using realistic equipment and scenarios. Research shows that children who participate in these immersive experiences develop more sophisticated understanding of professional roles, better grasp of workplace relationships and responsibilities, and enhanced social skills through collaborative work simulations. The Japanese approach reflects cultural values emphasizing preparation for adult roles and the importance of understanding one's place in society.

Chinese researchers have investigated the powerful role of family influences on children's career concepts. Studies by Wang and Shi found that parental occupations and attitudes significantly shape preschoolers' career aspirations more strongly than in Western contexts. This reflects the importance of family in Chinese culture and suggests the need for family-engaged career education programs that help parents understand their influence and provide guidance on exposing children to diverse career options. Chinese preschools increasingly incorporate career education through picture books, role-play areas, and field trips, though implementation varies considerably between urban and rural areas and between public and private programs.

These diverse international approaches demonstrate that while cultural contexts shape implementation, certain principles appear universal. Effective career education for preschoolers emphasizes experiential learning, involves families and communities, addresses stereotypes proactively, and integrates career awareness throughout the curriculum rather than treating it as a separate subject. Each country's approach offers valuable lessons, and the most effective programs often adapt strategies from multiple international models to fit local contexts.

Pedagogical Methodologies

The methods used to introduce preschool children to professions significantly influence the effectiveness of career education programs. International research has identified several pedagogical approaches that prove particularly effective with young children, each offering unique benefits and addressing different aspects of career awareness development.

Role-play and dramatic play consistently emerge as the most effective methods for introducing professions to preschoolers across diverse cultural contexts. Young children naturally engage in pretend play, often acting out adult roles they

observe in their lives. Well-designed dramatic play centers that represent various workplaces harness this natural inclination for educational purposes. Studies by Pyle and Danniels demonstrate that well-equipped dramatic play centers representing hospitals, stores, construction sites, restaurants, post offices, and other workplaces facilitate deep learning about professional roles and responsibilities. These play areas work best when they include authentic props and tools that children can manipulate. For example, a medical play area might include stethoscopes, bandages, prescription pads, patient charts, and medical uniforms. A restaurant play area could feature menus, order pads, play food, cooking utensils, and cash registers. The authenticity of materials helps children develop more accurate understanding of what professionals actually do.

Professional development should address not only the what and how of career education but also the why, helping teachers understand the theoretical foundations and research evidence supporting early career education. Teachers who grasp why career education matters are more likely to prioritize it within busy schedules and implement it with fidelity. Professional development should also address teachers' own biases and stereotypes, creating space for honest reflection about how educators' beliefs may inadvertently reinforce stereotypes children bring from home and media.

Program evaluation should be built into career education initiatives from the beginning, even given the assessment challenges discussed earlier. Regular reflection on program effectiveness using multiple data sources including observations of children's play, analysis of children's artwork and conversation, documentation of field trips and professional visits, and feedback from families helps programs continuously improve. This evaluation need not involve formal standardized testing but should include systematic observation and documentation of children's learning and development. Evaluation findings should inform ongoing program refinement, ensuring that career education evolves in response to children's needs and interests. Finally, starting small and building gradually represents a realistic approach for programs with limited resources or experience with career education. Rather than attempting comprehensive career education immediately, programs might begin by focusing on one area such as establishing one well-equipped dramatic play center, organizing quarterly professional visits, or taking monthly field trips to local workplaces. As teachers gain confidence and experience, programs can expand gradually. This incremental approach prevents overwhelm and allows learning from experience before scaling up efforts.

Implications for Policy and Practice

The research evidence regarding career education for preschool children carries significant implications for educational policy and practice at multiple levels. Policymakers, administrators, and educators must consider how to translate research findings into systemic improvements that ensure all young children receive high-quality career education.

International research overwhelmingly supports introducing preschool children to various professions as a valuable component of early childhood education. Effective career education during these formative years contributes to cognitive development, reduces stereotypes, enhances social-emotional competencies, and lays foundations for future career decision-making.

However, quality implementation requires adequate resources, well-prepared educators, culturally responsive approaches, and strong community partnerships. As the world of work continues evolving rapidly, preparing children from their earliest years to navigate career possibilities becomes increasingly important.

Future research should explore emerging professions' introduction, technology's role in career education, and cross-cultural comparative studies. Additionally, investigating how early career education can address challenges like artificial intelligence's impact on future employment would provide valuable insights.

The evidence suggests that when thoughtfully implemented with developmentally appropriate practices, career education enriches preschool experiences and empowers children to envision diverse, meaningful futures.

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МИКРОБИОТА КИШЕЧНИКА И ОКСИДАТИВНЫЙ СТРЕСС КАК ВЗАИМОСВЯЗАННЫЕ ЗВЕНЬЯ ПАТОГЕНЕЗА ХРОНИЧЕСКОГО ПАНКРЕАТИТА

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Хронический панкреатит (ХП) остаётся одной из наиболее частых патологий пищеварительной системы, сопровождающейся стойким воспалением и фиброзом поджелудочной железы. Особое внимание уделяется роли кишечной микробиоты и оксидативного стресса как взаимосвязанных факторов, определяющих тяжесть и исход заболевания. Настоящее исследование направлено на изучение микробного состава кишечника, показателей перекисного окисления липидов и антиоксидантной активности у больных ХП. В последние годы доказано, что микробиота не только участвует в регуляции местного иммунитета, но и оказывает влияние на системные воспалительные реакции. При панкреатите нарушение микробного равновесия приводит к избыточному поступлению бактериальных эндотоксинов в системный кровоток, активации цитокинового каскада и развитию оксидативного стресса. Это обуславливает тяжесть клинического течения, частоту рецидивов и прогрессирование фиброза.

Материалы и методы. Обследовано 68 пациентов с хроническим панкреатитом в стадии обострения (средний возраст $44,7 \pm 2,3$ лет) и 30 здоровых лиц контрольной группы. Определялись микробиологические показатели кала методом посева и ПЦР-идентификации (*Lactobacillus spp.*, *Bifidobacterium spp.*, *E. coli*, *Clostridium difficile*). В плазме крови исследовались уровни малонового диальдегида (МДА), супероксиддисмутазы (СОД), каталазы и глутатионпероксидазы (ГПО). Тяжесть состояния оценивалась по шкале M-ANNHEIM и индексу боли (VAS).

Результаты исследования. У больных ХП выявлено двукратное снижение уровня *Lactobacillus spp.* и *Bifidobacterium spp.* ($p < 0,01$) на фоне увеличения количества *Clostridium spp.* в 2,5 раза. Средний уровень МДА составил $6,2 \pm 0,5$ мкмоль/л против $1,8 \pm 0,2$ мкмоль/л в контроле ($p < 0,001$), при этом активность СОД и ГПО была снижена на 43% и 38% соответственно. Между выраженностью оксидативного стресса и тяжестью заболевания установлена положительная корреляция ($r = 0,63$; $p < 0,05$).

После трёхнедельного курса комплексной терапии, включающей пробиотик *Lactobacillus rhamnosus GG* (10^9 КОЕ/сут) и антиоксидант α -токоферол (400 мг/сут), отмечено улучшение клинического состояния у 74% пациентов, нормализация стула и снижение уровня МДА на 45% по сравнению с исходными значениями.

Обсуждение. Результаты подтверждают наличие патогенетической связи между нарушением микробного гомеостаза и усилением процессов перекисного окисления липидов. Коррекция микробиоты способствует снижению воспалительного потенциала кишечника, нормализации антиоксидантной защиты и уменьшению частоты рецидивов. Использование пробиотиков и антиоксидантов в составе базисной терапии повышает её эффективность и способствует восстановлению функциональной активности поджелудочной железы.

Выводы. Нарушение кишечной микробиоты и повышение оксидативного стресса играют ключевую роль в прогрессировании хронического панкреатита. Включение пробиотических и антиоксидантных препаратов в стандартную терапию улучшает клинико-лабораторные показатели и снижает выраженность воспаления. Перспективным направлением является разработка комбинированных схем лечения, направленных на восстановление микробиоценоза и нормализацию метаболического статуса пациентов.

ПРАВОВЫЕ ОСНОВЫ ЦИФРОВИЗАЦИИ ТУРИСТИЧЕСКОЙ ИНДУСТРИИ В РЕСПУБЛИКЕ УЗБЕКИСТАН

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Аннотация

В статье представлен сравнительный анализ роли и значимости цифровой экономики в развитии туризма и гостиничной индустрии на примере Узбекистана. Особое внимание уделено воздействию цифровых технологий на эволюцию туристического сектора, включая внедрение электронных виз, развитие электронной торговли, онлайн-бронирования и цифровых платформ для управления туристическими потоками. Рассмотрены ключевые нормативно-правовые акты, направленные на цифровую трансформацию туристической сферы, а также статистические данные, подтверждающие рост числа туристов и совершенствование инфраструктуры. В исследовании акцентируется внимание на цифровизации как основном факторе повышения инвестиционной привлекательности и конкурентоспособности туризма и гостиничного сектора в глобальной экономике.

Ключевые слова: цифровая экономика, туризм, гостиничный бизнес, электронная виза, Узбекистан, цифровая трансформация, туристическая инфраструктура, международное взаимодействие, государственное регулирование, онлайн-сервисы.

LEGAL FOUNDATIONS OF THE DIGITALIZATION OF THE TOURISM INDUSTRY IN THE REPUBLIC OF UZBEKISTAN

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Abstract

The article presents a comparative analysis of the role and significance of the digital economy in the development of tourism and the hospitality industry using Uzbekistan as an example. Special attention is given to the impact of digital technologies on the evolution of the tourism sector, including the implementation of electronic visas, the development of e-commerce, online booking systems, and digital platforms for managing tourist flows. The study examines key regulatory and legal frameworks aimed at the digital transformation of the tourism industry, as well as statistical data

demonstrating the growth in the number of tourists and the improvement of infrastructure. The research emphasizes digitalization as a major factor in enhancing the investment attractiveness and competitiveness of tourism and the hospitality sector in the global economy.

Keywords: digital economy, tourism, hospitality industry, e-visa, Uzbekistan, digital transformation, tourism infrastructure, international cooperation, public policy, online services.

В последние годы была проделана значительная работа по расширению сферы туризма и совершенствованию гостиничной системы. Принят ряд нормативно-правовых актов, направленных на развитие данной отрасли. В частности, 5 января 2019 года был опубликован Указ Президента Республики Узбекистан № ПФ-5611 «О дополнительных мерах по ускоренному развитию туризма в Республике Узбекистан». В этом указе впервые была предусмотрена система выдачи электронных въездных виз. Кроме того, данным указом была утверждена Концепция развития туристической отрасли в Узбекистане на 2019–2025 годы [1].

Также Указ Президента Республики Узбекистан № ПФ-5781 от 13 августа 2019 года «О мерах по дальнейшему развитию туристической отрасли в Республике Узбекистан» способствовал широкому внедрению в индустрию туризма и гостиничного бизнеса электронных виз, электронной коммерции и онлайн-торговли [2].

Согласно официальным данным, Узбекистан обладает огромным туристическим и рекреационным потенциалом. В стране насчитывается 7,4 тысячи объектов культурного наследия, из которых 209 расположены в четырех музейных городах – «Ичан-Кала в городе Хива», «Исторический центр города Бухара», «Исторический центр города Шахрисабз» и «Город Самарканд». Эти объекты включены в Список всемирного наследия ЮНЕСКО.

В период с 2010 по 2017 годы объем экспорта туристических услуг удвоился и в 2017 году составил 546,9 млн долларов США, а в 2018 году – 1 041 млн долларов США. Среднегодовой темп роста числа иностранных посетителей до 2016 года составлял 8%, в 2017 году – 7%, превысив отметку в 2,69 млн человек. По итогам 2018 года Узбекистан посетили 5,3 млн иностранных туристов.

Благодаря мерам, направленным на поддержку и защиту частного сектора, количество туристических организаций, которое в 2015 году составляло 398, к

концу 2018 года увеличилось до 950, а число гостиничных хозяйств возросло с 661 до 900.

Введен новый механизм сертификации туристических автотранспортных средств, рассчитанных на перевозку 8 и более пассажиров, в результате чего в 2018 году автопарк туристических транспортных средств пополнился 128 единицами (47 автобусов и 81 микроавтобус) [2].

Безусловно, внедрение цифровых технологий в сферу туризма и гостиничного бизнеса не является случайным. В настоящее время в мире наблюдается тенденция роста цифровой экономики.

Международные статистические исследования также подтверждают этот факт. В частности, в ходе анализа уровня цифровизации частного сектора экономики Европейского Союза, проведенного компанией McKinsey, было установлено, что уровень цифровизации высок в сфере финансов, телекоммуникаций и средств массовой информации, средний – в горнодобывающей промышленности, а в таких отраслях, как сельское хозяйство, строительство и туризм, – низкий. Результаты анализа представлены в следующей таблице [3]:

Анализ также показывает, что даже регионы и страны, являющиеся лидерами в сфере цифровой экономики, не могут в полной мере реализовать свой потенциал по внедрению цифровых технологий. В США уровень внедрения цифровых технологий составляет 18%, тогда как в Европе этот показатель достигает лишь 12% [4].

К сожалению, пандемия коронавируса нанесла серьезный удар по стремительно развивающейся сфере международного туризма. По оценкам аналитиков **Economist Intelligence Unit (EIU)**, в результате пандемии туристическая индустрия может понести потенциальные убытки в размере 80 миллиардов долларов США. Поскольку продолжают появляться новые штаммы и очаги коронавируса, туристический поток остается на низком уровне [5].

В Узбекистане отрасль выживает за счет внутреннего туризма. Ситуация, вызванная пандемией, приведет к усилению конкуренции между странами за привлечение иностранных туристов. Именно цифровизация национального туризма может способствовать повышению конкурентоспособности туристической отрасли.

Н.Н. Шаховалов в своем учебном пособии «Интернет-технологии в туризме» отмечает, что на сегодняшний день 64% туристических сделок совершается через Интернет, тогда как в других отраслях этот показатель колеблется в диапазоне от 30% до 40% [6]. Борьба за привлечение туристов посредством

цифровизации туристической отрасли уже началась. Это можно рассмотреть на примере нескольких азиатских стран.

К сожалению, глобальная пандемия COVID-19 нанесла серьезный удар по туристическому рынку и его развитию. По данным Всемирной туристской организации (UNWTO), 2020 год стал худшим за всю историю наблюдений организации. Число туристов снизилось на 1 млрд человек (на 74%) по сравнению с 2019 годом. Доходы мировой туристической отрасли сократились на 1,3 трлн долларов США, а число рабочих мест в сфере туризма уменьшилось на 100–120 млн. UNWTO прогнозировала восстановление ситуации к 2023 году [8]. Однако мутации коронавируса и появление новых очагов инфекции поставили эти прогнозы под сомнение.

Согласно данным Всемирной туристской организации, в первом квартале 2021 года показатели туризма оказались на 180 млн человек (на 83%) ниже, чем за аналогичный период 2020 года. Наибольшие потери (94%) пришлось на Азиатско-Тихоокеанский регион, с которым напрямую связан Узбекистан [9].

В связи с этим в нашей стране были приняты ряд нормативно-правовых актов, направленных на снижение негативного влияния пандемии на сферу туризма. 29 мая 2020 года Президент Республики Узбекистан издал Указ № ПФ-6002 «О неотложных мерах поддержки туристической отрасли для смягчения негативного влияния пандемии коронавируса». В соответствии с данным указом были предоставлены многочисленные льготы для субъектов бизнеса, работающих в туристическом секторе. В их число вошли: снижение налога на прибыль на 50%, право на перенос убытков на последующие периоды, временная отмена сбора с туристов, предоставление субсидий за привлечение туристов, компенсация расходов туроператоров на авиабилеты и железнодорожные билеты, а также дополнительные меры поддержки для турагентств, туроператоров и гостиничных предприятий.

В отличие от других отраслей экономики, восстановление и активизация туризма напрямую зависят от туристического потока, а объем экспорта услуг в данной сфере — от количества иностранных граждан, посещающих страну. Вскоре после подписания вышеупомянутого указа, 19 июня 2020 года, был принят Указ Президента Республики Узбекистан «О дополнительных мерах по развитию сферы туризма при строгом соблюдении усиленного режима санитарно-эпидемиологической безопасности». В данном указе одной из ключевых инициатив была обозначена страховка туристов, предусматривающая выплату до 3000 долларов США в случае заражения коронавирусом.

Кроме того, указом было установлено обязательное внедрение системы «Uzbekistan. Safe travel GUARANTEED» на объектах, обслуживающих иностранных туристов. Было также предусмотрено, что должностные лица туристических объектов, не прошедших сертификацию по данной системе, будут привлечены к ответственности в порядке, установленном законодательством.

9 декабря 2020 года Президент Республики Узбекистан Шавкат Мирзиёев провел видеоселекторное совещание, посвященное вопросам развития туризма в условиях пандемии. На совещании были определены целевые показатели на 2021 год: привлечение 1,7 млн иностранных и 7,5 млн внутренних туристов, увеличение экспорта туристических услуг до 370 млн долларов. Также было отмечено, что использование возможностей паломнического туризма позволит привлечь 700 тысяч паломников и обеспечить экспорт услуг на сумму 130 млн долларов. В связи с этим были намечены конкретные задачи.

В качестве логического продолжения мер, направленных на обеспечение устойчивого развития туристической отрасли в условиях пандемии, Президент Республики Узбекистан 9 февраля 2021 года издал указ «О дальнейших мерах по развитию внутреннего и паломнического туризма в Республике Узбекистан». В соответствии с данным указом, срок действия ряда льгот и преференций был продлен до 31 декабря 2021 года. Благодаря своевременному и эффективному применению указанных мер туристическая отрасль страны была спасена от полного паралича, а особое внимание уделялось использованию потенциала внутреннего туризма.

При этом развитие или кризисные явления в туристической отрасли неизбежно оказывают влияние и на гостиничный сектор. В настоящее время гостиницы активно внедряют цифровизацию всех процессов – от выбора типа номера и его бронирования до оплаты с использованием специализированных приложений. Одной из таких технологий является Hilton Honors, которая в настоящее время проходит тестирование. Данная технология позволяет пользователям заказывать гостиничные услуги, знакомиться с картой отеля и получать доступ к другим необходимым сервисам.

В целом в мире активно внедряется цифровая платформа «Туризм 4.0», характеризующаяся следующими принципами:

максимальная автоматизация всех этапов;

значительный вклад и важность научных исследований;

управление всеми системами и этапами туристического обслуживания с использованием Интернета;

обеспечение функционирования туристических услуг на основе единой онлайн-системы взаимодействия.

Система «Туризм 4.0» наиболее активно развивается в странах с высоким уровнем цифровизации. В целом, стремительное развитие электронной коммерции в туризме наблюдается в США, странах Западной Европы, Индии, Бразилии и России. В Китае, Чили и других странах с высоким туристическим потенциалом также уделяется особое внимание развитию цифрового туризма. Это означает, что все страны, стремящиеся развивать свой туристический потенциал, неизбежно будут интегрироваться в рынок электронного туризма.

В качестве вывода можно выразить следующие мысли:

1. Усиление проникновения цифровой экономики в страны мира и глобальную экономику оказывает значительное влияние на цифровизацию туристической отрасли.
2. Широкое распространение мобильных телефонов, глобальной информационной сети «Интернет», включая веб-сайты, социальные сети, а также наличие систем заказа услуг и их оплаты через мобильные приложения создают большие возможности для цифровизации туризма.
3. На фоне негативного влияния глобальной пандемии на мировой туризм каждое государство стремится привлечь к себе больше туристов. Однако из-за сохраняющейся угрозы коронавируса многие люди пока не готовы путешествовать. В такой ситуации поток туристов возрастет в те страны, которые смогут создать для них наибольший комфорт. В этом контексте цифровой туризм играет важную роль, обеспечивая туристам удобство, и его развитие напрямую влияет на развитие туризма в целом [15].

Исходя из вышеизложенного, целесообразно осуществить следующие меры:

Принять государственную программу по обеспечению всех регионов страны скоростным интернетом.

Разработать мобильные приложения и средства пропаганды для повышения цифровой грамотности населения в сфере цифровой экономики.

Увеличить количество и качество мобильных приложений, программ и рекламных материалов, представляющих туристический потенциал Узбекистана на международном уровне.

Цифровизировать услуги, предоставляемые частными домохозяйствами в туристических зонах [14].

Разработка организационно-правовых основ для государственного субсидирования, кредитования или инвестирования в форме государственно-частного партнерства стартапов, направленных на развитие потенциала цифрового туризма, а также проведение различных конкурсов на республиканском уровне.

В последние годы (2016–2021) мировая потребность в таких стартапах выросла на 62%, покупка железнодорожных билетов через мобильные приложения – на 50%, а использование туристических услуг – на 65% [13].

Проведенные анализы еще раз подтвердили взаимосвязь экономики и права, их взаимное влияние и регулирование. Аналогично, экономико-правовое регулирование цифрового туризма играет важную роль в его развитии.

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ME'DA OSTI BEZI TUZILISHI, ANATOMIYASI VA KLINIK AHAMIYATI

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Annotatsiya

Me'da osti bezi (pancreas) — inson organizmidagi aralash sekretiya bezlaridan biri bo'lib, u ham ekzokrin, ham endokrin funksiyalarni bajaradi. Bezning tuzilishi, joylashuvi va qon ta'minoti uning fiziologik faoliyatini ta'minlaydi. Me'da osti bezi ichak ostida joylashgan bo'lib, bosh, tana va dum qismlaridan tashkil topgan. Uning ekzokrin qismi ovqat hazm qilish fermentlarini ishlab chiqaradi, endokrin qismi esa insulin, glukagon va somatostatin gormonlarini ajratib, uglevod almashinuvini boshqaradi. Ushbu bezning tuzilishi va faoliyatidagi buzilishlar qator kasalliklar, xususan, pankreatit, diabet mellitus va o'smalar rivojlanishiga sabab bo'ladi. Shuning uchun me'da osti bezining anatomiyasi va klinik ahamiyatini chuqur o'rganish tibbiy amaliyotda muhim ahamiyat kasb etadi.

Kalit so'zlar: me'da osti bezi, anatomiyasi, fiziologiyasi, ekzokrin va endokrin funksiyalar, insulin, pankreatit, diabet mellitus, klinik ahamiyat.

Kirish

Oshqozon osti bezi kengaytirilgan, yordamchi ovqat hazm qilish bezi bo'lib, qorin orqa devorida L1 va L2 umurtqalari tanasini kesib o'tib, retroperitoneal joylashgan. Oshqozon osti bezi qorinning yuqori qismida o'ng tomonda o'n ikki barmoqli ichak va chap tomonda taloq o'rtasida ko'ndalang yotadi. U bosh, bo'yin, tana va dumga bo'linadi. Bosh pastki kavak vena va buyrak venasida yotadi va o'n ikki barmoqli ichakning C halqasi bilan o'ralgan. Oshqozon osti bezining dumi taloq tepasiga qadar cho'ziladi. Oshqozon osti bezi ekzokrin sekretiya (asinar hujayralaridan oshqozon osti bezi shirasi) ishlab chiqaradi, so'ngra oshqozon osti

bezining asosiy va yordamchi yo'llari va qonga kiradigan endokrin sekretsiyalar (glyukagon va insulin) orqali o'n ikki barmoqli ichakka kiradi.

Tuzilishi va funktsiyasi

Oshqozon osti bezi 4 qismga bo'linadi: bosh, bo'yin, tana va dum.

Oshqozon osti bezining boshi - o'n ikki barmoqli ichakning C shaklidagi egri chizig'i bilan o'ralgan bezning kattalashgan qismi. O't yo'li o'n ikki barmoqli ichakning pastga tushadigan qismiga ketayotganda boshning posterosuperior yuzasidagi truba ichida yotadi yoki uning moddasiga singib ketadi. Oshqozon osti bezi tanasi bo'yindan davom etadi va aorta va L2 vertebra ustidan o'tadi. Oshqozon osti bezi tanasining old yuzasi periton bilan qoplangan. Tananing orqa yuzasi qorin pardasidan mahrum. U aorta, yuqori tutqich arteriyasi (SMA), chap buyrak usti bezi, chap buyrak va buyrak tomirlari bilan aloqa qiladi.

Oshqozon osti bezining bo'yni qisqa. Oshqozon osti bezining dumi chap buyrakning old tomonida joylashgan bo'lib, taloq tolasi va chap kolik egiluvchanligi bilan chambarchas bog'liq. Oshqozon osti bezi sekretsiyasini olib yuruvchi asosiy oshqozon osti bezi o't yo'li bilan qo'shilib, o'n ikki barmoqli ichakning tushuvchi qismiga ochiladigan gepatopankreatik ampulani hosil qiladi. Oddi gepatopankreatik sfinkteri gepatopankreatik ampula atrofidagi silliq mushak sfinkteri bo'lib, safro va oshqozon osti bezi shirasining ampulaga oqishini nazorat qiladi va o'n ikki barmoqli ichak moddalarining ampulaga qaytishini inhibe qiladi.

Hujayra turlari

Oshqozon osti bezining ko'p qismi (taxminan 80%) ekzokrin oshqozon osti bezi to'qimasidan iborat. Bu me'da osti bezi akinuslaridan (cho'qqisi lümen tomon yo'naltirilgan piramidal asinar hujayralar) qilingan. Ular apikal mintaqada zich zimogen granulalarni o'z ichiga oladi, bazal mintaqada yadro va endoplazmatik retikulum (hazm qilish fermentlarini sintez qilishda yordam beradi) mavjud. Bu fermentlar Golji kompleksi deb ataladigan sekretor pufakchalarda saqlanadi. Asinar hujayralarning bazolateral membranasida ovqat hazm qilish fermentlarining ekzositozini tartibga soluvchi sekretin, xoletsistokinin va atsetilxolin kabi neurotransmitterlar uchun bir nechta retseptorlar mavjud.

Oshqozon osti bezi ichida endokrin hujayralarni o'z ichiga olgan Langerhans orolchasi ham mavjud. Ekzotsitoz bilan ajralib chiqadigan ekzokrin fermentlardan farqli o'laroq, endokrin fermentlar oshqozon osti bezi qon oqimidagi murakkab

kapillyar tarmoq orqali qon oqimiga kiradi. 4 xil endokrin hujayralar mavjud (A xujayralari glyukagon, B hujayralari insulin, D hujayralari somatostatin, F xujayralari pankreatik polipeptid ishlab chiqaradi).

Yulduzsimon hujayralar oshqozon osti bezi ichidagi epiteliya tuzilmalarining bevosita shakllanishidir. Surunkali pankreatit kabi holatlarda bu hujayralar yallig'lanish va fibrozni kuchaytiradi.

Qon ta'minoti va limfa tomirlari

Arterial ta'minot

Taloq arteriyasining shoxlari (chölyak magistralining bir tarmog'i), yuqori tutqich arteriyasi (SMA) va umumiy jigar arteriyasi oshqozon osti bezini qon bilan ta'minlaydi.

Pankreatik bosh: gastroduodenal arteriya (umumiy jigar arteriyasining bir tarmog'i) pankreatikoduodenal arteriya (PDA) shaklida oshqozon osti bezining boshini va unsinat jarayonini ta'minlaydi. Boshning pastki qismining bir qismi SMA dan kelib chiqadigan pastki PDA tomonidan ta'minlanadi.

Tana va quyruq: taloq arteriyasi va uning shoxlari ularni ta'minlaydi.

Vena ta'minoti

Oshqozon osti bezi boshi: bosh yuqori tutqich venasiga (SMV) tushadi.

Tana va bo'yin: taloq venasi ularni chiqaradi.

SMV va taloq venasi birlashib, portal venani hosil qiladi.

Nervlar

Oshqozon osti bezi parasempatik, simpatik va hissiy innervatsiyalarning murakkab tarmog'iga ega. Bundan tashqari, ichki nerv pleksusiga ega. Simpatik va parasempatik tolalar oshqozon osti bezining asinar hujayralariga tarqaladi. Parasempatik tolalar orqa vagal magistraldan kelib chiqadi va sekretomotordir, ammo oshqozon osti bezi sekretsiyasi asosan o'n ikki barmoqli ichakning epiteliyal hujayralari va stomatit birikmalari bilan tartibga solinadigan proksimal ichak shilliq qavati tomonidan ishlab chiqariladigan xoletsistokinin va sekretin tomonidan ta'minlanadi. Simpatik innervatsiya T6-T10 torakal splanxnik nervlar va çölyak pleksus orqali amalga oshiriladi.

Klinik ahamiyati

Teshilishi

Oshqozon osti bezining teshilishi natijasida qorin bo'shlig'iga amilaza va lipaz kabi ovqat hazm qilish fermentlari sekretsiyasi va oshqozon osti bezi o'z-o'zidan hazm bo'lishiga olib keladi. Oshqozon osti bezini jarrohlik yo'li bilan olib tashlash mumkin bo'lsa-da, odam umr bo'yi qon glyukozasini tartibga solish va ovqat hazm qilish uchun zarur bo'lgan oshqozon osti bezi fermenti qo'shimchalariga duch keladi.

Saraton

Oshqozon osti bezi saratonini, xususan, oshqozon osti bezi adenokarsinomasini davolash juda qiyin va odatda jarrohlik uchun juda kech bosqichda tashxis qo'yiladi. Yosh bemorlarda oshqozon osti bezi saratoni kam uchraydi; tashxis qo'yishning o'rtacha yoshi 71. Xavf omillariga chekish, semizlik, qandli diabet va 1-toifa ko'p endokrin neoplaziyalar va irsiy polipozsiz yo'g'on ichak saratoni kiradi.

Qandli diabet

1-turi

1-toifa qandli diabet - bu otoimmün kasallik bo'lib, immunitet tizimi oshqozon osti bezining insulin ishlab chiqaradigan hujayralariga hujum qiladi, natijada insulin kamayadi. 1-toifa diabet odatda bolalikda rivojlanadi. 1-toifa diabet bilan og'rigan bemorlar omon qolish uchun insulin in'ektsiyalariga muhtoj.

2-turi

Qandli diabet 2-toifa diabetning eng keng tarqalgan shakli hisoblanadi. Kasallik odatda insulin qarshiligi va insulin sekretsiyasi buzilishining kombinatsiyasi tufayli yuqori qon shakarini keltirib chiqaradi. Davolash dietadagi va jismoniy faoliyatdagi o'zgarishlarni, shuningdek, metformin kabi biguanidlarni o'z ichiga oladi.

Yallig'lanish

Oshqozon osti bezining yallig'lanishi pankreatit deb ataladi. Bu takroriy o't toshlari, spirtli ichimliklarni iste'mol qilish, qizamiq, parotit, dori-darmonlar, alfa-1 antitripsin etishmovchiligi va chayon chaqishi bilan bog'liq.

Pankreatit qorinning markaziy qismida kuchli og'riqni keltirib chiqaradi, bu esa orqa tomonga tarqaladi. Bu sariqlik bilan bog'liq bo'lishi mumkin. Pankreatit ko'pincha rangpar najas va quyuq siydik bilan namoyon bo'ladi.

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THE INFLUENCE OF DIGITAL TECHNOLOGY USAGE ON CHILDREN'S WELL-BEING

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Research Aim:

The aim of this study is to analyze the influence of digital technology usage on various aspects of children's well-being, including their emotional, cognitive, and social development. The research seeks to determine how screen time, type of digital activity, and parental involvement affect children's mental health, empathy, and behavioral regulation. Special attention is given to identifying the balance between beneficial and harmful digital engagement and to outlining preventive strategies that support healthy digital habits among school-aged children.

Materials and Methods

The study was conducted from February to June 2025 among 160 school-aged children (8–15 years) from urban and suburban schools. A cross-sectional survey method was applied to evaluate the effects of digital technology use on children's emotional, cognitive, and social well-being. Data were collected through a structured questionnaire consisting of sections on screen time, type of device, purpose of use, and parental control. Psychological parameters such as attention span, emotional regulation, and sleep quality were assessed through both self-reports and parental feedback. All collected data were analyzed using SPSS version 28.0, applying descriptive statistics and correlation analysis to identify significant relationships between screen exposure and behavioral outcomes ($p < 0.05$). Ethical approval and parental consent were obtained prior to data collection.

Results

Out of 160 participants, 51% were male and 49% female, with a mean age of 11.8 ± 2.1 years. The average daily screen time was 4.3 ± 1.7 hours, exceeding the recommended two-hour limit for most children. A significant association was found between excessive screen use and sleep disturbances (64%), reduced physical activity (58%), and emotional irritability (47%) ($p < 0.05$). Children who used digital devices mainly for entertainment showed lower concentration levels and weaker social interaction compared to those using technology primarily for educational purposes. However, moderate digital use (2–3 hours per day) under parental supervision was linked to better academic engagement and improved emotional stability, suggesting that balanced and guided technology use can have positive effects on children's cognitive and psychological well-being.

Conclusion

This study concludes that digital technology has a dual effect on children's well-being. Moderate and purposeful use—especially for educational or creative activities—can enhance learning motivation, emotional awareness, and problem-solving abilities. In contrast, excessive and unsupervised screen time negatively impacts sleep quality, emotional balance, and social interaction. To protect children's mental and physical health in the digital era, parents and educators should promote balanced screen

time, encourage physical activities, and develop digital literacy programs that teach responsible and mindful technology use.

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METHODS OF IMMUNOLOGICAL EXAMINATION OF DIAGNOSTICS IN PREGNANT PEOPLE WITH HEMODYNAMIC CHANGES IN THE HEART

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The prevalence of rheumatic heart disease is significantly high in developing countries, which is why it is one of the most common heart diseases in pregnant women. Heart disease is an important cause of maternal mortality in developing countries. In the presence of mitral stenosis (MS), the risk of decompensation of cardiac activity increases, which can threaten the life of both mother and fetus. An urgent task is to develop a system for early prediction of disorders of the adaptive capacity of the myocardium, especially in conditions of mitral stenosis, in order to timely intervene and correct therapy.

Materials and Methods. 110 pregnant women were examined in accordance with the goals and objectives of the work. The research program will be implemented jointly with the Department of Obstetrics and Gynecology No. 2 of the Bukhara State Medical Institute on the basis of the Bukhara Perinatal Center, Bukhara City Maternity Complex. The average age was 28.4 ± 4.7 years.

Results. Severe AP was diagnosed in 21 patients (28.4%). IL-6 and PCT levels within 24 hours of admission were significantly higher in the severe group (IL-6: 94.6 ± 8.3 pg/ml vs. 32.1 ± 4.5 pg/ml; PCT: 3.2 ± 0.6 ng/ml vs. 0.8 ± 0.2 ng/ml; $p < 0.001$). The correlation between IL-6 levels and BISAP scores was $r = 0.71$ ($p < 0.01$). Elevated cystatin-C was associated with renal dysfunction and prolonged hospitalization. Patients receiving antioxidant therapy demonstrated a 1.6-fold faster reduction in CRP levels and a 37% lower incidence of necrotic complications compared to the control group. The average hospital stay was reduced from 14.2 ± 2.1 to 9.3 ± 1.8 days ($p < 0.01$).

Discussion. IL-8 levels were elevated in 77.3% of women (on average 42.3 pg/ml), TNF- α in 64.5% (on average 14.6 pg/ml), which may indicate activation of the innate immune response. The level of IL-2 exceeded the norm in 36.4% of patients (on average 21.2 pg/ml), while the level of IL-10 was reduced in 52.7% of the examined (on average 9.7 pg/ml), reflecting a deficiency in the anti-inflammatory cytokine response.

The data obtained indicate marked changes in the immune and inflammatory status of pregnant women with mitral stenosis. Excess levels of ESR, CRP, IL-8 and TNF- α confirm the presence of a chronic inflammatory process, which may be associated with both the activity of rheumatic valve damage and hemodynamic disorders.

A marked increase in fibrinogen and D-dimer indicates a hypercoagulable state, which is particularly dangerous in the context of pregnancy and may increase the risk of thrombotic complications. Despite this, the INR and APVT values in most patients remained within the normal range, which may be due to compensatory mechanisms.

Conclusions. Determination of the cytokine profile from the first trimester in women with mitral stenosis is a promising direction in the cardiology of pregnant women. This makes it possible to timely identify the risks of impaired adaptive capacity of the myocardium, determine a pregnancy management strategy and minimize adverse outcomes. Future research should focus on creating standardized risk scales and integrating cytokine monitoring into clinical practice.

INTERNATIONAL EXPERIENCE IN TEACHING SCIENCESBU UZING INTERACTIVE WHITEBOARDS

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Abstract: In this thesis written about some interactive methods for enhancing the lesson process. Also highlighted many theory task and ways to improve their skills for future teachers and coaches. Furthermore, we discussed some useful ways of teaching students in different subjects via white boards.

Keywords: modern devices, interactive methods, whiteboards, distance learning

In recent decades, digital technologies have become an integral part of the educational process. In teaching, especially in the field of science, special attention is paid to the use of interactive whiteboards. So, it is possible to imagine the experience of using interactive whiteboards in education, their advantages and development prospects. Interactive whiteboards are modern devices that combine the functions of a projector and a computer. They allow the teacher not only to project images onto the board, but also to interact with them using a touch screen or a special pen. It is no secret that interactive whiteboards are widely used to increase the efficiency of learning subjects. During the lesson, teachers use interactive whiteboards to demonstrate live examples and visualize concepts of political, cultural processes taking place in the world and realities that attract language learners based on their age and interests. Thanks to this, students get a clearer idea of the material and learn new knowledge more easily. In this process, language or science learners achieve the following results:

- ☐ they take lessons aimed at developing new knowledge,
- ☐ They take lessons aimed at teaching skills and competencies.,
- ☐ they test knowledge repetition and generalization lessons in practice,
- lessons aimed at reinforcing skills, assessing and evaluating knowledge — expedition (field trip)
- lessons — are also conducted in the form of practical activities. Competition-based lessons, such as
- test trials, contests, and other interactive methods, help strengthen and consolidate the material
- learned.

It is considered appropriate for future educators to apply the following aspects that help students retain theoretical concepts and new terminology of the subject in their memory. Visualization: using interactive whiteboards allows you to visualize abstract concepts and processes within the subject, which makes them more accessible and understandable for students. With the help of interactive

whiteboards, the teacher can create interactive lessons that include tasks, tests and games, which will help students actively participate in the learning process. Interactive whiteboards allow you to use various multimedia resources, such as animations, videos and interactive simulations, for more visual and interesting learning. The use of interactive whiteboards creates a modern learning environment that meets the requirements of the modern world and prepares students to use modern technologies in their future professional activities. In addition to the existing benefits, interactive whiteboards have the potential for further development and improvement. Their use in scientific education can be expanded by developing new software products and applications specifically tailored for a particular field of knowledge. Also, an important direction of development is the integration of interactive whiteboards with other modern technologies, such as virtual and augmented reality, which allows you to create a more interesting and effective learning environment. In the modern world, education is becoming increasingly digital and technologically oriented. One of the most innovative technologies introduced into the educational process is interactive whiteboards. They are becoming an integral part of language learning, in particular. When using interactive whiteboards in education, they are modern analogues of traditional magnetic marker boards, enriched with touch screen functionality and the ability to interact with digital materials. They allow the teacher to create interactive lessons that include various multimedia elements, such as images, videos, animations, and interactive applications.

The use of interactive whiteboards in various disciplines is of particular importance. They allow you to visualize complex concepts and processes, which makes them more accessible and understandable for students. For example, in natural science lessons, they can be used to demonstrate cell structures or biological processes, and in chemistry, to model chemical reactions. Interactive whiteboards also help to activate students. Thanks to the ability to interact with the whiteboard, they can participate in the lesson, solve problems, conduct experiments and create their own projects. This helps to develop students' critical thinking, independence and creative potential. The prospects for using interactive whiteboards in science education are very encouraging. With the development of technology and the emergence of new software and hardware solutions, the functionality of interactive whiteboards will continue to expand. The possibilities for visualizing and interacting with digital materials are becoming more diverse and easy to use. The further development of interactive whiteboards is also associated with integration with other technologies, such as virtual and augmented reality. This allows for a more immersive and interactive learning environment, where students can immerse themselves in virtual laboratories, conduct experiments, and study various phenomena and processes. In addition, the use of interactive whiteboards helps to move to more flexible and personalized teaching methods. Teachers can create personalized teaching materials tailored to the individual needs and abilities of each student. This helps to increase the effectiveness of the learning process and improve learning outcomes. Interactive whiteboards play an important role in modern science education. They allow you to visualize complex concepts, activate students, and create an interactive learning environment. The prospects for the use of interactive whiteboards in this area are very encouraging, and with the development of technology, they will continue to play an important role in improving the quality of education and developing teaching techniques. Against the background of the rapid development of technology in the modern world, education cannot be left behind. The introduction of new technologies into the educational process in the field of natural sciences is especially important, where

it is important to ensure not only the transfer of information, but also the practical development of the material. In this regard, interactive whiteboards (IW) occupy a special place, which provide unique opportunities for teaching and assimilation of knowledge. In this article, we will consider the experience of using interactive whiteboards in scientific education, as well as the prospects for their application. Interactive whiteboards are multimedia devices that allow teachers and students to interact with the content of the lesson. With their help, you can display graphs, tables, animations, videos, etc. The experience of using interactive whiteboards in scientific education shows that they are effective in attracting students' attention, making the learning process more interesting and engaging. Interactive whiteboards are a powerful tool for modern scientific education. Their use promotes active and interactive participation of students in the learning process, provides access to various educational resources and helps to develop skills in working with modern technologies. The prospects for the use of interactive whiteboards in science education are very broad and include the development of new technologies, integration with artificial intelligence and the creation of a unique learning environment.

Thus, the use of interactive whiteboards in science education opens up new opportunities for improving the quality of education and increasing students' interest in the subjects being studied. Experience shows that this is an effective tool that helps to develop students' skills in science. The prospects for the development of this technology indicate its importance and relevance for the modern educational environment.

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DESCRIPTION OF THE IMAGE OF THE MOON IN THE WORKS OF SOMERSET MAUGHAM AND AHMAD A'ZAM

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Abstract. *This article analyzes the symbolic meanings of the Moon archetype in Western and Eastern mythology and its reflection in fiction. The Moon archetype is considered as a carrier of deep symbolic meanings in the human psyche, and its interpretation in literary works is studied from a philosophical and psychological perspective. The article analyzes the mythological origin of the archetype, its transformation in literature, and its connection with existential content. The research uses the method of comparative literary studies.*

Keywords: *Archetype, mythology, existentialism, "The Moon and Sixpence", "The flange of the Moon", symbol, individualism.*

The moon has occupied a unique place since ancient times as one of the most important symbolic images in human culture and mythology. It holds significant meaning in the mythological systems, religious conceptions, and literary works of various peoples, serving as an important tool for expressing the human inner world, spiritual quests, and existential problems. The moon archetype not only possesses aesthetic and symbolic importance but is also considered a universal symbol reflecting the deep layers of the human psyche. From the perspective of Carl Gustav Jung's archetype theory, the moon is interpreted as an important element of the collective unconscious, embodying traces of humanity's general psychological experiences and cultural heritage. As Jung emphasized, archetypal images are deeply rooted in humanity's general imagination and manifest in unique forms across different cultures and eras.

The symbolism of the moon has been interpreted differently in various cultures. In Western mythology, the moon is often associated with femininity, mysterious psyche, and mutability, for example, through the Greek goddess Artemis or the Roman goddess Diana. In Eastern mythology, the moon is more commonly depicted as a symbol of spiritual awakening, love, and beauty, such as in the Chinese mythology's Chang'e or in Uzbek folklore's tales and legends related to the moon. This diversity demonstrates the universal and local characteristics of the moon archetype, making it an interesting object for comparative analysis in literary studies.

The purpose of the article is to analyze the place of the moon archetype in Western and Eastern mythology, as well as to explore its transformation in artistic literature and its connection to existential content. The study examines the following main questions: What symbolic meanings does the moon archetype hold in various mythological systems? What artistic transformations does it undergo in literary works? How are human existential quests and inner conflicts expressed through the moon archetype? To answer these questions, comparative literary studies, mythological analysis, and psychoanalytic approaches are applied.

The mythological interpretation of the moon archetype varies across cultures, but its core meanings are related to human spiritual and philosophical quests. For example, in Greek mythology, the moon

goddess Artemis is associated with purity, independence, and nature, while in Christian conceptions, the moon is often interpreted as a symbol of holiness and spiritual light. In Eastern mythology, particularly in Chinese culture, the moon goddess Chang'e holds an important place as a symbol of immortality and spiritual journey. In Uzbek folklore, the moon is often depicted as a symbol of love, beauty, and spiritual purity, for example, in folk epics like "Alpomish" or "Oysuluv."

In literature, the moon archetype is used as an important tool for expressing the human inner world and existential problems. In Western literature's individualistic approaches, the moon is often interpreted as a symbol of personal freedom and self-discovery, while in Eastern literature's approaches characteristic of collective consciousness and national spirit, it reflects problems related to spiritual awakening and fate. These differences demonstrate the various interpretations of the moon archetype depending on cultural context.

In the mythological interpretation of the moon archetype, its phases (full moon, new moon, waxing and waning moon) play an important role. For example, in Greek mythology, the moon phases are interpreted as symbols of cyclical changes and renewal in human life. In Eastern mythology, particularly in Chinese conceptions, the moon phases are linked to the yin-yang philosophy, expressing balance and harmony. In Uzbek folklore, the full moon is often depicted as a symbol of spiritual elevation and the harmony of love, while the new moon is associated with new beginnings and hope. These phases are also used in literature as an important tool for reflecting changes in the human inner world.

In Somerset William Maugham's "The Moon and Sixpence," the moon archetype is used as a symbol of the protagonist Charles Strickland's inner quests and the process of self-realization through art. Here, the moon is interpreted as a metaphor for spiritual awakening and striving toward the ideal. Strickland's radical changes in his life path are linked to the changeable nature of the moon phases, expressing existential content through his inner conflicts and detachment from society. The moon symbol reflects Strickland's choice between worldly values and art, appearing as the central element of his self-discovery process.

In Uzbek literature, in Ahmad A'zam's "The Dust of the Moon" ("Oyning gardishi"), the moon archetype is interpreted in the context of national spirit and existential problems. In the work, the moon serves not only as a symbol of beauty and spiritual purity but also as an emblem of the characters' relationship with fate and their inner struggles. The characters' interrelations and conflicts gain deeper meaning through the moon archetype, demonstrating a unique interpretation of existential quests in national literature.

In "The Moon and Sixpence," the moon archetype expresses the anarchic and creative spirit in Strickland's inner world, while in "The Dust of the Moon," the moon reflects the connection to the collective consciousness of national culture. For example, in "The Dust of the Moon," through the moon symbol, the characters' spiritual quests in the Uzbek worldview and their connection to communal values are analyzed. The differences between these two works vividly demonstrate the individualistic approach of the West and the characteristics inherent to the collective consciousness of the East. Additionally, in "The Moon and Sixpence," the moon symbol expresses Strickland's detachment from society and his choice of a unique path, while in "The Dust of the Moon," the moon reflects the characters' process of accepting their fate and achieving spiritual balance.

The moon archetype is used in literary works as an important tool for expressing existential content. In "The Moon and Sixpence," Strickland's self-realization through art is linked to one of the main ideas of existentialism – the human independently finding their purpose. In "The Dust of the Moon," through the moon archetype, the characters' struggle against fate and spiritual quests are reflected. In both works, the moon is interpreted as a symbol of the process of discovering one's inner world.

Comparative analysis shows that in "The Moon and Sixpence" and "The Dust of the Moon," the existential content is interpreted through the moon archetype in different cultural contexts. In Maugham's work, the moon is linked to ideas of individualism and self-realization through art in Western literature, while in Ahmad A'zam's work, existential problems related to national spirit and collective consciousness are reflected. The differences between these two works demonstrate the diverse interpretations of the archetype from cultural and philosophical perspectives.

From the perspective of existentialism, the moon archetype expresses the hesitations and conflicts in the process of human self-realization. In Jean-Paul Sartre's existentialist philosophy, it is emphasized that humans create their own fate, which is clearly evident in Strickland's independent choice of path through art in "The Moon and Sixpence." In "The Dust of the Moon," the existential content is interpreted in a national context, that is, in a manner characteristic of the spiritual values of the Uzbek people. Through the moon symbol, the characters' process of accepting or struggling against their fate is linked to the national spirit, demonstrating a unique interpretation of existential problems in Uzbek literature.

The interpretation of the moon archetype in literature depends not only on cultural context but also on the author's personal worldview and creative goals. For example, in Maugham's "The Moon and Sixpence," the moon archetype is linked to modernist tendencies in Western literature, expressing human detachment from society and striving for individual freedom. In Ahmad A'zam's "The Dust of the Moon," the moon archetype is interpreted as a synthesis of national modernism and traditional values in Uzbek literature. The differences between these two works demonstrate the various interpretations of the archetype not only from cultural but also from philosophical and aesthetic perspectives.

Additionally, the interpretation of the moon archetype in contemporary literature is noteworthy. In contemporary literature, the moon is often interpreted in the context of ecological problems, gender issues, and global cultural changes. For example, in some works of contemporary Western literature, the moon archetype is used as a symbol of restoring human connection with nature. In contemporary Eastern literature works, the moon often expresses conflicts between traditional values and the modern world. These tendencies demonstrate the dynamic nature of the moon archetype and its relevance in the contemporary world.

The moon archetype holds its place in mythology and literature as an important symbol expressing the deep layers of the human psyche. In Western and Eastern mythology, the moon holds various meanings and is used in literary works as an important tool for expressing existential content. The analyses in "The Moon and Sixpence" and "The Dust of the Moon" show that the moon archetype embodies universal and cultural characteristics in reflecting human inner quests, spiritual awakening, and relationship with fate.

Through analyzing the place of the moon archetype in mythological and literary contexts, its deep significance in human culture and psyche has been explored. The moon archetype holds its place as

a universal symbol expressing the human inner world, spiritual quests, and existential problems in Western and Eastern mythology as well as literature. In Western mythology, the moon is often linked to femininity, mutability, and mysterious psyche, while in Eastern mythology, it is interpreted as a symbol of spiritual awakening, love, and collective consciousness. In literary works, the moon is used as an important tool for reflecting the process of self-realization, relationship with fate, and inner conflicts.

All in all, in the article, Somerset William Maugham's "The Moon and Sixpence" and Ahmad A'zam's "The Dust of the Moon" were comparatively analyzed. In "The Moon and Sixpence," the moon archetype expresses the protagonist Charles Strickland's self-discovery through art and striving for individual freedom, while in "The Dust of the Moon," the moon is interpreted as a symbol of national spirit, spiritual balance, and existential quests related to fate. Through these works, the various interpretations of the moon archetype in the individualistic approach of the West and the collective consciousness approach of the East were identified. These differences demonstrate the diversity of the archetype not only from cultural but also from philosophical and aesthetic perspectives.

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O'ZBEKISTONDA AGROTURIZMNING RIVOJLANISH ISTIQBOLLARI

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Iqtisodiyot kafedrası o'qituvchisi

Annotatsiya. Maqolada O'zbekiston Respublikasida agroturizmning hozirgi holati va uning kelajakdagi rivojlanish istiqbollari tahlil etilgan. Muallif agroturizmni qishloq xo'jaligi, ekologiya, madaniyat va iqtisodiyotni uyg'unlashtiruvchi soha sifatida ko'rib chiqadi. Qishloq infratuzilmasini modernizatsiya qilish, mahalliy aholining bandligini oshirish va xorijiy sayyohlarni jalb etish orqali hududiy rivojlanishga erishish imkoniyatlari yoritiladi. Shuningdek, maqolada xalqaro tajribalar bilan solishtirma tahlil o'tkazilib, O'zbekiston sharoitida agroturizmni samarali yo'lga qo'yish uchun zarur bo'lgan tashkiliy, huquqiy va iqtisodiy mexanizmlar taklif etiladi.

Kalit so'zlar: agroturizm, qishloq xo'jaligi, ekologik turizm, iqtisodiy barqarorlik, qishloq infratuzilmasi, xalqaro tajriba, turizm siyosati, barqaror rivojlanish.

Аннотация. В статье анализируется современное состояние агротуризма в Республике Узбекистан и перспективы его развития. Автор рассматривает агротуризм как отрасль, объединяющую сельское хозяйство, экологию, культуру и экономику. Показаны возможности достижения регионального развития за счет модернизации сельской инфраструктуры, повышения занятости населения и привлечения иностранных туристов. Проведен сравнительный анализ с международным опытом, предложены организационно-правовые и экономические механизмы, необходимые для эффективного развития агротуризма в условиях Узбекистана.

Ключевые слова: агротуризм, сельское хозяйство, экологический туризм, экономическая устойчивость, сельская инфраструктура, международный опыт, туристическая политика, устойчивое развитие.

Abstract. The article analyzes the current state of agrotourism in the Republic of Uzbekistan and its future development prospects. The author considers agrotourism as a sector that combines agriculture, ecology, culture and economy. The possibilities of achieving regional development through modernization of rural infrastructure, increasing employment of the local population and attracting foreign tourists are highlighted. The article also conducts a comparative analysis with international experience and proposes organizational, legal and economic mechanisms necessary for the effective establishment of agrotourism in the conditions of Uzbekistan.

Keywords: agritourism, agriculture, ecological tourism, economic sustainability, rural infrastructure, international experience, tourism policy, sustainable development.

KIRISH

So'nggi yillarda turizm dunyo iqtisodiyotining eng tez o'sayotgan tarmoqlaridan biriga aylandi. BMT Jahon turizm tashkiloti (UNWTO) ma'lumotlariga ko'ra, pandemiyadan keyingi davrda sayohatlarning yangi yo'nalishlari — xususan, ekologik va agroturizm — jadal sur'atlarda rivojlanmoqda. Bu yo'nalishlarda sayyohlar nafaqat dam olishni, balki mahalliy madaniyat, dehqonchilik, milliy taomlar va tabiiy hayot tarzini bevosita tajriba sifatida his etishni xohlashadi.

O'zbekiston agrar mamlakat sifatida boy tabiiy resurslar, qadimiy dehqonchilik an'analari va mehmondo'st qishloq aholisi bilan agroturizmni rivojlantirish uchun katta salohiyatga ega. Prezident Shavkat Mirziyoyev rahbarligida qishloq joylarda tadbirkorlikni qo'llab-quvvatlash, turizmni diversifikatsiya qilish hamda "Har bir mahalla — tadbirkor hudud" dasturlari doirasida agroturizmga alohida e'tibor qaratilmoqda.

ASOSIY QISM

Agroturizm — bu qishloq xo'jaligi faoliyati bilan bog'liq turizm turi bo'lib, sayyohlarga dehqonchilik, chorvachilik, bog'dorchilik yoki uzumchilik jarayonida ishtirok etish, mahalliy mahsulotlarni tayyorlash, milliy taomlarni tatib ko'rish, qishloq hayotini yaqindan o'rganish imkonini beradi.

Dunyo tajribasida bu yo'nalish Italiya, Fransiya, Ispaniya, Yaponiya va Turkiyada keng rivojlangan. Masalan, Italiyadagi "Agriturismo" modeli orqali fermer xo'jaliklari sayyohlar uchun mehmon uylari, gastronomik dasturlar va milliy festivallar tashkil etish orqali barqaror daromad manbaiga aylangan.

O'zbekiston sharoitida ham bu modelni mahalliy an'analar asosida moslashtirish mumkin. Buxoro, Farg'ona, Samarqand, Qashqadaryo va Surxondaryo viloyatlaridagi tabiiy landshaft, bog'dorchilik madaniyati va milliy taomlar — agroturizm uchun noyob resurslardir.

Hozirgi kunda O'zbekistonda turizmning ekologik va qishloq yo'nalishlari endigina shakllanmoqda. "2022–2026 yillarda turizmni rivojlantirish konsepsiyasi"da agroturizmni qo'llab-quvvatlash ustuvor yo'nalishlardan biri sifatida belgilangan. Ayrim viloyatlarda — xususan, Surxondaryo viloyati Denov tumani, Farg'ona vodiysi Rishton, Buxoro viloyati G'ijduvon, Samarqand viloyati Urgut tumanlarida — tajriba loyihalari yo'lga qo'yilgan.

Bu xo'jaliklarda sayyohlar paxta terish, sabzavot yetishtirish, asalarichilik, non yopish yoki milliy taom pishirish jarayonida bevosita qatnashish imkoniga ega. Ammo bu tashabbuslar hali keng miqyosga chiqqani yo'q. Aksar hollarda ularning faoliyati mahalliy tashabbuskorlar va kichik grantlar doirasida cheklangan.

Agroturizmning eng muhim afzalligi — qishloq aholisi bandligini oshirish va daromad manbalarini diversifikatsiya qilishdir. Fermer xo'jaliklari faqat mahsulot yetishtirish bilan emas, balki turizm orqali xizmat ko'rsatish, milliy hunarmandchilik, ekologik mahsulotlar savdosi kabi faoliyat bilan shug'ullanish imkoniga ega bo'ladi.

Bundan tashqari, agroturizm orqali [1]:

- Mahalliy yoshlarning shaharga migratsiyasi kamayadi;
- Qishloq infratuzilmasi (yo'llar, transport, internet, sanitariya tizimi) rivojlanadi;
- Milliy madaniyat, an'analar va ekologik muhit asrab qolinishiga turtki bo'ladi.

Shuningdek, agroturizm ayollar bandligini oshirishda ham samarali vosita bo'la oladi — uy mehmonxonalari, milliy oshxonalar, kulolchilik yoki kashtachilik ustaxonalari orqali xotin-qizlar o'z tadbirkorlik faoliyatini yo'lga qo'yishi mumkin.

Italiya tajribasida "agroturizm"ni rivojlantirish davlat tomonidan subsidiyalar va soliqqa imtiyozlar orqali qo'llab-quvvatlanadi. Fransiya har bir agriturizm xo'jaligi "ekosertifikat" olishi shart bo'lib, bu sifat va xavfsizlik kafolatini beradi. Yaponiyada esa "farm stay" dasturlari yoshlarni qishloq hayotiga qaytarish siyosatining bir qismi sifatida amalga oshiriladi.

O'zbekiston uchun ushbu tajribalardan quyidagi xulosalarni chiqarish mumkin [2]:

- Agroturizmni tartibga soluvchi huquqiy bazani takomillashtirish;
- Fermer xo‘jaliklariga imtiyozli kredit va subsidiyalar ajratish;
- Mahalliy brendlarni shakllantirish (masalan, “Surxon agrohouse”, “Farg‘ona green life”);
- Kadrlar tayyorlash tizimini joriy etish — kollej va oliy ta’lim muassasalarida “agroturizm menejmenti” yo‘nalishini tashkil etish.

XULOSA VA MUNOZARA

O‘zbekiston uchun agroturizm — bu nafaqat yangi iqtisodiy yo‘nalish, balki qishloq joylarda barqaror rivojlanishning strategik omilidir. Uning muvaffaqiyati hukumat siyosati, mahalliy aholi faolligi, xususi sektor investitsiyasi va xalqaro hamkorlik uyg‘unligiga bog‘liq.

Kelgusida agroturizmni rivojlantirish uchun:

1. Qishloq xo‘jaligi va turizm vazirliklari hamkorligida maxsus milliy dastur ishlab chiqish;
2. Ekoturizm va agroturizm klasterlarini yaratish;
3. Raqamli marketing va xalqaro brendlash strategiyasini yo‘lga qo‘yish zarur.

Agar bu chora-tadbirlar tizimli amalga oshirilsa, O‘zbekiston Markaziy Osiyoda agroturizmning yetakchi markaziga aylanishi uchun barcha imkoniyatlarga ega.

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MAKTABGACHA YOSHDAGI BOLALARDA TABIATGA MEHR UYG'OTISHNING ZAMONAVIY USULLARI

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Annotatsiya: Mazkur maqolada maktabgacha yoshdagi bolalarda tabiatga mehr uyg'otishning samarali va zamonaviy metodlari yoritilgan.

Tabiatga mehr uyg'otish orqali ekologik ong, estetik did, hissiy sezgirlik, kuzatuvchanlik kabi ijobiy sifatlar shakllanadi. Tabiatga e'tiborli, uni sevuvchi yosh avlodni tarbiyalash bugungi kundagi muhim vazifalardan biridir. Tadqiqotda ekologik o'yinlar, interaktiv metodlar va amaliy mashg'ulotlar yordamida bolalarda atrof-muhitga ehtiyotkor munosabatni shakllantirishning samarali yo'llari ko'rib chiqildi. Natijalarga ko'ra, qiziqarli va ijodiy yondashuv bolalarning tabiat haqidagi bilimlarini chuqurlashtiribgina qolmay, balki ularda ekologik madaniyatning rivojlanishiga ham hissa qo'shadi.

Kalit so'zlar: tabiatga mehr, maktabgacha ta'lim, ekologik tarbiya, innovatsion metodlar, o'yin texnologiyalari

KIRISH

Tabiat — odamning paydo bo'lgunicha ham, odam ishtiroki bilan ham mavjud borliq. Umuman — bu dunyo, odam, koinot; mikromakromega dunyolar; Jonsiz. va jonli narsalar bor. Tor ma'noda — tabiat fanlari o'rganadigan obyekt. Tabiat odamga, jamiyatga bog'liq bo'lmagan qonuniyatga bo'ysunadi. Odam tabiatning bir qismi. Odam tabiat qonunlarini o'zgartira olmaydi, faqat qonunlardan foydalanib, tabiat elementlarini, qismlarini o'zlashtirishi mumkin. Tabiat tushunchasi insoniyat jamiyati yashashi tabiiy sharoitlarining majmui sifatida ham qaraladi. Inson yashashi uchun mehnat qiladi, mehnat (mas., dehqonchilik, qurilish, sanoat), miya faoliyati va boshqa esa tabiatning ba'zi jihatlarini o'zgartiradi. Odam tomonidan, ya'ni ijtimoiy mehnat jarayonida yaratiladigan moddiy boyliklar shartli ravishda „ikkinchi tabiat“ deyiladi. Maktabgacha yosh – bu inson hayotidagi eng nozik, eng ta'sirchan davr. Bu davrda bola atrof-muhitga juda sezgir bo'ladi, u har bir rangni, tovushni, harakatni chuqur his qiladi. Aynan shu yoshda tabiatga bo'lgan mehrni uyg'otish – uni butun umrga yo'naltirish demakdir. Shaxsan menimcha, bu mehr faqatgina kitob yoki dars orqali emas, balki jonli tajriba – ya'ni, bolani tabiat bilan bevosita tanishtirish orqali rivojlanadi.

Ko'p kuzatganman: bola ko'chat ekib, uni har kuni sug'organda, daraxtda yangi kurtak chiqqanini o'z ko'zi bilan ko'rganda, u tabiatni o'zining bir qismidek qabul qiladi. Bu mehr majburiyatdan emas, balki ichki tuyg'u – samimiy g'amxo'rlik asosida shakllanadi. Zamonaviy texnologiyalar davrida

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a) Interaktiv metodlar: Smart doska yoki planshetlarda ekologik ilovalar orqali o‘rganish (masalan, “Green Tree”, “Eco-fun” o‘yinlari).

Animatsion videolar va virtual sayohatlar: bolalar onlayn tarzda o‘rmon, daryo, tog‘lar bilan tanishadi. QR-kodli topshiriqlar: tabiatdagi belgilarni skaner qilib, vazifa bajarish (bolalar bog‘ida amaliyotga joriy etilmoqda).

b) Loyihaviy faoliyat:

“Mening daraxtim” – har bir bola bir daraxtni parvarishlaydi va uning o‘shini kuzatadi.

“Tabiat posboni” loyihasi – bolalar haftalik topshiriqlar asosida chiqindilarni ajratish, suv tejash va qushlarga g‘amxo‘rlik qilishni o‘rganadi.

“Ekologik albom” – rasmlar, kollaj va kichik hikoyalar orqali tabiat manzaralari yaratiladi.

c) Ochiq havoda o‘yin va mashg‘ulotlar:

“Tabiat detektivi” o‘yini – bolalar daraxtlar, barglar yoki qushlarning izlarini topishga harakat qiladi.

“Eko-yugurish” – yugurish davomida yerga tashlangan qog‘oz yoki plastiklarni yig‘ish va ularni ajratish.

“Quyosh nuri bilan rasm chizish” – barg, gul soyasi bilan tabiiy usulda suratlar yaratish.

d) Dramaturgiya va rolli o'yinlar:

"Men tabiatman" – bola daraxt, qush, suv rolini ijro etadi va o'zini tabiat o'rniga qo'yib ko'radi.

"Tabiat himoyachilari" – ekopatrul sifatida chiqindi, ifloslanish haqida insonga murojaat qiladi.

3. O'yinlar va amaliy mashg'ulotlar orqali tarbiya:

Sensor o'yinlar: Tabiiy materiallardan (qum, tuproq, barg) foydalanib, hissiy sezgirlikni rivojlantirish.

"Ekologik hikoyani davom ettir" – yarimta ekologik voqea beriladi, bola o'z tasavvurida tugatadi.

"Kimni uyiga joylashtiramiz?" – hayvon, qush, daraxtlarga mos yashash joylarini topish o'yini.

Suvni tejash laboratoriyasi: oddiy tajribalar orqali bolalar suv isrofini ko'rsatadi va echim topadi.

4. Ota-onalar bilan hamkorlik:

Ota-onalar uchun ekologik kunliklar joriy etilishi (har kuni tabiatga oid biror amal qilish). Oila bilan "ekosayyohat" – sayr vaqtida chiqindini yig'ish, qushlar kuzatuvi kabi mashg'ulotlar. Bolaning bog'dagi faoliyatini uyda davom ettirish uchun "eko-vazifalar" berish.

Xulosa: Xulosa qilib aytganda, maktabgacha yoshdagi bolalarda tabiatga mehr uyg'otish pedagogik jarayonning ajralmas qismidir.

Zamonaviy metodlar – ekologik ertaklar, interaktiv o'yinlar, STEAM loyihalari, virtual ekskursiyalar orqali bolada tabiatga nisbatan muhabbat, mas'uliyat hissi, ekologik ong va ijtimoiy faoliyat shakllanadi. Bu esa kelajakda tabiatni asraydigan ongli avlodni tarbiyalashda muhim poydevor bo'ladi.

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SYNCRETISM OF ISLAMIC ARCHITECTURE AND LOCAL BUILDING TRADITIONS: FROM THE SAMANIDS TO THE TIMURIDS

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Abstract. This article examines the syncretism of Islamic architecture and local building traditions in Central Asia from the Samanid through the Timurid period. Focusing on ninth to fifteenth-century monuments, it analyzes how new Islamic architectural forms merged with and were informed by the region's pre-Islamic construction practices. From the chahar-taq fire temple layout evident in the Ismail Samani Mausoleum to the monumental Timurid complexes of Samarkand, the development of architecture in Transoxiana is shown to be a fusion of Persian, Sogdian, and other local elements with Islamic design principles[1]. The study highlights key stages of this synthesis and demonstrates how it gave rise to a distinct regional architectural style. The findings reveal that the creative integration of indigenous forms and motifs with Islamic architectural norms under the Samanids, Qarakhanids, and Timurids produced an architectural heritage of outstanding value, one that preserved local identity within the broader Islamic world.

Keywords: Islamic architecture; local traditions; syncretism; Samanids; Timurids; Central Asia; architectural heritage; mausoleum; pishtaq; brickwork.

Annotatsiya. Ushbu maqolada Markaziy Osiyoda IX–XV asrlarda islom me'morchiligi va mahalliy qurilish an'analari uyg'unlashuvi ilmiy asosda tahlil qilingan. Somoniylar davridan Temuriylargacha bo'lgan davr me'moriy obidalarini misolida, yangi islomiy me'moriy shakllarning mintaqaning qadimiy mahalliy uslublari bilan sintezlanish jarayoni yoritib beriladi. Somoniylar maqbarasining zardushtiycha chortaq rejasidan boshlab, Temuriylar davridagi yirik monumental inshootlarga bo'lgan rivojlanish bosqichlari o'rganilib, ushbu sintez hududiy me'moriy maktabning shakllanishiga qanday zamin yaratgani ko'rsatiladi. Natijalar islom me'morchiligida mahalliy an'analarni saqlab qolish va ulardan ijodiy foydalanish mintaqaning betakror me'moriy merosini yaratganini ko'rsatadi.

Kalit so'zlar: islom me'morchiligi; mahalliy an'analari; sintez; Somoniylar; Temuriylar; Markaziy Osiyo; me'moriy meros; gumbazli maqbara; peshtoq; g'isht dekoratsiyasi.

Аннотация. В статье исследуется синкретизм исламской архитектуры и местных строительных традиций в Центральной Азии в период с эпохи Саманидов до эпохи Тимуридов. На примере архитектурных памятников IX–XV вв. показано, как новые формы исламской архитектуры впитывали и перерабатывали богатое наследие домусульманских строительных практик региона. От плана зороастрийского храма огня, прослеживаемого в мавзолее Исмала Самани, до грандиозных тимуридских ансамблей Самарканда – прослеживается постепенное объединение персидско-согдийских элементов с исламскими архитектурными концепциями[1, p. 32][2, p. 35]. Особое внимание уделено тому, как данное взаимодействие способствовало рождению уникального регионального архитектурного стиля

и обеспечило преемственность традиций. Результаты показывают, что творческое сочетание местных форм и исламских канонов лежит в основе величественного архитектурного наследия Узбекистана, признанного во всем мире.

Ключевые слова: исламская архитектура; местные традиции; синтез; Саманиды; Тимуриды; Центральная Азия; архитектурное наследие; мавзолее; пештак; кирпичный орнамент.

INTRODUCTION. Islamic architecture in Central Asia underwent a remarkable process of synthesis between the 9th and 15th centuries, blending imported religious forms with established local construction techniques and artistic motifs[3, p. 92][2, p. 35]. During this period, which spans from the Samanid dynasty to the Timurid Empire, builders created structures that were unmistakably Islamic in function yet imbued with the spirit of local traditions. A prime example is the famed Ismail Samani Mausoleum in Bukhara (early 10th century), often described as “a fire temple in Islamic dress” for its Zoroastrian-derived domed square plan clad in Islamic architectural detail[2, p. 35]. This monument set the tone for subsequent Central Asian mausolea, establishing a template of a four-arched, domed cube that would reappear in later tombs of Seljuk and Timurid rulers[4, p. 1]. Likewise, its masterful baked-brick workmanship – the culmination of a long local tradition of brick construction – demonstrated how thoroughly pre-Islamic building practices were integrated into Islamic architecture[5, p. 169]. Monuments such as this allowed the new Muslim dynasties to legitimize themselves by echoing familiar indigenous forms, thus creating an architectural language both authentically regional and Islamic in character[6, p. 105][7, c. 49].

Scholars have long recognized the significance of this syncretic architectural development. Early 20th-century orientalist V. V. Barthold noted the richness of Central Asia’s medieval cultural life, including its architecture, in the context of Iranian and Turkic civilization[8, p. 290]. More recently, Uzbek researchers like Sh. Kamoliddin have revisited the Samanid era, shedding new light on the cultural and urban achievements of Ismail Samani’s reign[9, p. 1]. Contemporary architectural historians have also contributed detailed studies: for example, R. P. McClary’s 2020 monograph provides a comprehensive catalogue of Qarakhanid-period monuments and their styles[10, p. 2], and L. Golombek’s surveys of Timurid architecture illustrate the evolution of forms that bridged Iran and Central Asia[11, b. 38][12, c. 48]. Despite such scholarship, the precise ways in which Islamic architecture absorbed local traditions in Central Asia’s formative Islamic centuries still merit close analysis[13, b. 285]. This study aims to trace the syncretic development of Central Asian architecture from the Samanids to the Timurids, highlighting how each era inherited and innovated upon the achievements of its predecessors. By examining representative monuments and drawing on both archaeological findings and historical texts, we seek to elucidate how the region’s builders created a unique architectural legacy that resonated with local identity even as it contributed to the broader canon of Islamic art.

METHODS. This research employs a historical-architectural approach, combining on-site architectural analysis with literature review of primary sources and modern scholarship. Key monuments from each period (Samanid, Qarakhanid, Timurid) were selected for detailed examination of their layout, structure, and decorative techniques. Architectural features were compared to identify continuities and innovations over time. In addition, historical documents

and epigraphic evidence were consulted – for instance, foundation inscriptions and waqf (endowment) records that shed light on the context of these buildings[14, b. 38][15, c. 250]. Descriptions by medieval historians (such as Narshakhi's *History of Bukhara*) were used to understand how contemporaries perceived these structures and which pre-Islamic traditions were consciously referenced by patrons.

This study also integrates findings from recent interdisciplinary investigations. Archaeological excavations and material analyses (e.g. of preserved brickwork and decorative elements) have provided data on construction techniques and materials. For example, new archaeological evidence from the Bukhara oasis – including the discovery of the Khuttalon votive structure – has been used by D. Tosheva (2023) to propose revised interpretations of the Samanid mausoleum's origins[2, p. 35]. We take into account such insights. Furthermore, we draw on quantitative analyses and stylistic comparisons found in the latest literature. A methodological framework combining comparative stylistics and heritage studies is employed, similar to approaches advocated by Uzbek scholars in recent works. By comparing design elements (plans, decorative motifs, structural solutions) across different eras, and referencing the scholarly consensus or debates around them, we develop an integrated perspective on how Islamic and local traditions were synthesized in the architecture of Central Asia. All sources are cited in text following GOST footnote style, with page references given for specific information. This blended methodology allows for a robust analysis that is both historically grounded and appreciative of artistic-technical details.

RESULTS. Early Islamic Era: Samanid Architecture and its Pre-Islamic Roots

The Samanid period (late 9th – 10th centuries) provides the earliest clear examples of Islamic monuments in Central Asia that fuse local and Islamic traditions. The most exemplary monument is the Ismail Samani Mausoleum in Bukhara (built circa 905), which was the dynastic family tomb of the Samanids. In form, it is a simple cube surmounted by a dome at the center of each facade – effectively a scaled-down adaptation of the *chahar-taq* (four-arch) Zoroastrian fire temple plan common in pre-Islamic Transoxiana[2, p. 35]. This design choice was no coincidence: it reflects a deliberate continuity with the region's pre-Islamic sacred architecture. The mausoleum's four identical doorways (one on each side) and the orderly, centrally-planned geometry evoke Sogdian and Bactrian temple layouts, reinterpreted here for an Islamic funerary purpose[2, p. 35]. As R. Hillenbrand noted, the building is essentially “a fire temple in Islamic dress” – its shape is reminiscent of a fire sanctuary, but its function and decoration proclaim the new Islamic ethos[2, p. 35].

In construction and ornamentation, the Samani Mausoleum also exemplifies syncretism. It is constructed entirely of fired brick, a material that had been central to local building techniques for centuries (in contrast to stone, which was scarce in the region)[18, p. 290][19, p. 290]. The Samanid architects elevated brickwork to an art form: the walls are exquisitely patterned with basket-weave and geometrical brick arrangements, creating a delicate textile-like effect in the façade[20, p. 32]. This reliance on decorative brick technique represents the culmination of an established Transoxianian tradition of baked-brick construction[5, p. 169]. Earlier, in pre-Islamic times, local builders in Bukhara and Samarkand had used carved wood and unbaked clay bricks for structures; by the Samanid era, the craft of firing bricks and laying them in complex bonds had reached new heights. The motifs formed by the brick lattice on the mausoleum – for instance, circle-within-square patterns, and dense vegetal or sunburst motifs – show clear continuity with pre-Islamic Sogdian decorative

themes[1, p. 32]. The architects essentially “translated” those motifs into brick relief. A local legend even maintains that the mortar was tempered with camel’s milk and rooster’s blood for added durability, symbolically infusing the structure with sacral qualities of the land[11, b. 38]. Whether apocryphal or not, this legend underscores the mausoleum’s status as a unique synthesis of Sogdian and Islamic building arts[11, b. 38].

The resulting edifice was not only aesthetically innovative but also carried ideological weight. By using a familiar ancient form for a Muslim tomb, Ismail Samani – the founder of the Samanid state – effectively linked his Islamic dynasty to the region’s deep-rooted cultural memory[1, p. 32][7, c. 49]. The mausoleum became a site of pilgrimage and veneration, reportedly supplanting older Zoroastrian shrines in popular devotion[14, b. 93][7, c. 49]. Thus, the fusion of styles served a political purpose: it embodied a visual statement that Islam in Central Asia was not a foreign imposition, but rather a natural evolution of local tradition in a new religious context[3, p. 92][4, p. 1].

Other architectural remains from the Samanid era reinforce this picture of syncretism. Excavations indicate that mosques of the period often retained elements of earlier courtyard and pillar designs. For example, early medieval mosque foundations in Central Asia show layouts with wooden columns supporting flat roofs – a practice inherited from ancient Iranian and Turkic assembly halls[15, c. 250]. While none of the Samanid-period mosques in Bukhara or Samarkand survive intact, historical texts like Narshakhi’s *History of Bukhara* mention the use of carved wooden pillars and elaborate stucco ornament in the region’s 10th-century mosques[15, c. 250][12, c. 48], suggesting continuity in construction techniques (wood carving, gypsum plaster carving) alongside the newer brick masonry. Furthermore, the Samanids are known to have patronized infrastructure like madrasas, ribats (caravanserai-fortresses), and bridges, likely built with local materials and methods (pakhsa earth walls, timber, etc.), though these structures have not survived.

Notably, toward the end of the Samanid period and into the Karakhanid takeover, we see the first instances of architects experimenting with new forms that would later flourish. An outstanding example is the Arab-Ata Mausoleum (c. 977) in the village of Tim near Samarqand[28, c. 49]. This small single-chamber mausoleum, probably built during the last years of Samanid influence, preserves the square domed plan of the Ismail Samani Mausoleum (including corner engaged columns and dome on squinches)[29, p. 2]. However, it introduces a splendid decorative *pishtaq* – a projected portal arch that dominates the façade[28, c. 49]. The arch of the Arab-Ata mausoleum’s portal is filled with elaborate carved terra-cotta brick decoration, including inscriptive bands and geometric fret patterns. These features give the structure an affinity with the emerging style of the 11th century[30, p. 2]. Indeed, the *pishtaq* (formal entrance portal) and the use of incised terracotta tiles seen in Arab-Ata represent a transition toward the Karakhanid architectural aesthetic[30, p. 2]. Similarly, the mausoleum of the last Samanid prince, Nasr b. Ahmad (built circa 1005 near Kerki), is described as a square domed building like the earlier model, but with decorative techniques foreshadowing the next era – it reportedly had a dome on a hexagonal base with niches and an inscription frieze, again bridging the earlier tradition with new ideas[31, c. 49]. These late-10th-century monuments demonstrate that by the close of the Samanid era, Central Asian architects were already evolving the classical *chahar-taq* form by adding grander frontal emphasis and more intricate surface ornament. In summary, the Samanid architectural legacy is one of integration and transition: it firmly established

the mixed Persian-Sogdian and Islamic style in brick, setting the stage for further developments in subsequent centuries[4, p. 1][6, p. 105].

The Qarakhanid Period: Continuity and Innovation in the 11th–12th Centuries. The Qarakhanid Khanate (late 10th – early 13th centuries), which succeeded the Samanids in Transoxiana, continued the syncretic architectural trajectory while also introducing new innovations. As the first Turkic dynasty to rule Central Asia after converting to Islam, the Qarakhanids initially had no indigenous Islamic architectural tradition of their own to draw upon[4, p. 1]. Consequently, they looked to the established models of their predecessors: the influence of Samanid architecture is particularly evident in Qarakhanid religious monuments[10, p. 2]. Qarakhanid architects adopted the domed square mausoleum type and refined it further. For instance, the mid-11th-century Mausoleum of Aisha Bibi (in present-day Kazakhstan) and the cluster of Uzgen Mausoleums (in Kyrgyzstan, 12th century) both echo the basic form of the Ismail Samani Mausoleum – a cubical volume with central dome – but embellish their facades with far more extensive ornament, including vegetal and epigraphic patterns carved in terracotta tiles[4, p. 1]. This reflects a greater emphasis on surface decoration that became a hallmark of Qarakhanid architecture.

One of the most significant contributions of the Qarakhanids was the development of brick decorative techniques to a high degree of sophistication. Brick remained the primary building material (as before), but now it was used in ever more creative ways. Qarakhanid architects pioneered methods such as the “outset fret” pattern, where specially shaped bricks protrude from the wall to create interlocking geometric designs[10, p. 2][4, p. 1]. These patterns, often arranged in panels or friezes, added a three-dimensional texture to building surfaces. An example can be seen above the arched entrance of the Magoki Attari Mosque in Bukhara (reconstructed in the 12th century on older foundations): there, a rectangular panel of interlocking swastika-like brick pattern (the so-called fret) adorns the arch apex, which is considered a precursor to a standard Qarakhanid motif[4, p. 1]. Another technique was the use of glazed ceramic inserts among brickwork – blue or green-glazed bricks spelling out Kufic inscriptions or forming floral motifs (a technique known as *banna’i*). This can be observed in the Kalyan Minaret in Bukhara (completed 1127) and the Vabkent Minaret (late 12th century) near Bukhara. Both minarets are cylindrical brick towers that taper upwards and are ringed by multiple bands of decorative brickwork and Kufic inscription friezes in glazed tile[13, b. 285]. The Kalyan Minaret’s shaft, for example, displays eight different patterns of brick relief, ranging from diagonal lattices to floral chains, each separated by narrow epigraphic bands – a tour de force of brick artistry that builds directly on the Samanid brick tradition but achieves a new level of complexity and monumentality[9, p. 1].

Architecturally, the Qarakhanids also introduced or popularized certain elements that would persist into later eras. The *pishtaq* portal – seen tentatively in the Arab-Ata mausoleum – became a standard feature in Qarakhanid madrasas and mosques, giving the buildings a defined focal point and a grand entrance. The remains of an 11th-century Namazgah (open-air mosque) in the Bukhara region, for instance, indicate a large *peshtak*-like façade used to frame the mihrab area of a monumental mosque[30, p. 2]. The Qarakhanid period also witnessed the construction of the first known madrasas (Islamic schools) in Central Asia and continued the development of city fortifications and civic structures using traditional materials (for example, the walls of Bukhara were rebuilt in this era with sun-dried bricks and towers). While few of these structures survive fully intact (many were later

rebuilt or lost to time), historical records and recent studies have pieced together their characteristics. Richard P. McClary's comprehensive study (2020) on Qarakhanid monuments documents dozens of sites across Transoxiana, illustrating how a distinct style took shape during this era[10, p. 2]. He notes that the Qarakhanids both emulated the Samanid models and gradually developed their own motifs, bridging the gap between the simple elegance of 10th-century forms and the bombast of Timurid architecture that would come later[10, p. 2].

One important observation is that the integrative approach continued: Qarakhanid structures combined Turkic elements with the established Iranian-Islamic forms. For example, wooden architecture did not disappear – in some smaller Qarakhanid mosques, wooden columns and carved wooden ceilings (a legacy of pre-Islamic Turkic building) were incorporated alongside the prevalent brick arcs. Meanwhile, Persian influence remained strong in aesthetics and calligraphy, as the administration and high culture of the Qarakhanids were heavily Persianized. Persian inscriptions in elegant scripts adorn many Qarakhanid coins and likely buildings, signaling the ongoing Persian cultural input in architecture as well[3, p. 92]. In essence, the Qarakhanid era reinforced the syncretic foundation laid by the Samanids: it kept the Samanid architectural vocabulary alive, expanded the decorative repertoire, and prepared the groundwork for the brilliant flowering of architecture under the Timurids. The continuity is evident in how later architects could look back to Qarakhanid innovations – such as bold brick patterns and the monumental portal – and elaborate upon them in subsequent periods.

The early 13th century brought upheaval with the Mongol invasion (Chinggis Khan's armies, 1219–1220), which devastated many cities of Central Asia. Bukhara, Samarkand, and others suffered destruction of their monumental structures[15, c. 250][15, c. 250]. As a result, there is a noticeable gap in major architectural projects in the first half of the 1200s. However, some construction continued under the Khwarezmshahs (who briefly controlled Transoxiana after the Qarakhanids and before the Mongols): notably, the mausoleum of Sultan Sanjar in Merv (built 1150s, technically Seljuk but in Greater Khorasan) and the Mausoleum of Sultan Ahmad Yasavi in Turkestan (begun 12th century, though the massive Timurid-era structure visible today was a rebuild) show that the domed-square mausoleum and intricate brick décor tradition persisted regionally. After the Mongol conquest, a period of relative stagnation ensued until the region's revival under Timur. The Chaghatay Khanate (the Mongol successor state in Central Asia) left few notable religious monuments, but by the mid-14th century, as Central Asia recovered economically, we see a renewed architectural activity – setting the stage for the Timurid Renaissance.

The Timurid Renaissance: Synthesis at its Zenith (14th–15th centuries). Under the Timurids (1370–1507), Central Asian Islamic architecture reached an apogee of scale and artistic refinement, often referred to as a Timurid Renaissance in art and architecture[6, p. 105][8, p. 290]. The Timurid period was characterized by a conscious revival and surpassing of earlier models: Timur (Tamerlane) and his successors viewed themselves as inheritors of the great architectural traditions of Persia and Turan, and they deliberately fused these influences to create truly monumental structures[12, c. 48][5, p. 169]. In terms of continuity, Timurid architecture preserved and improved many construction methods of past centuries[8, p. 290]. Brick construction remained fundamental – every major Timurid edifice from mosques to palaces was built with brick as the core structural material, just as in prior eras[9, p. 1]. Time-tested techniques such as the use of squinches (architectural devices to transition

from a square room to a dome) continued, though they were often enhanced or combined with new techniques[8, p. 290][9, p. 1]. For example, whereas earlier domes rested on four squinches, Timurid architects developed a system of intersecting arches and *muqarnas* that distributed the weight more elegantly, allowing for much larger domes[9, p. 1]. It is noteworthy that Timurid engineers did not discard the squinch entirely; rather, they used it in conjunction with arch-net techniques – demonstrating an evolution from the Samanid squinch-based dome construction towards more complex solutions[9, p. 1].

At the same time, the Timurid era introduced dramatic innovations and scale that set its buildings apart. One key factor was Timur's empire-building strategy: after conquering cities like Isfahan, Shiraz, and Damascus, he forcibly relocated the best craftsmen – architects, tile-makers, masons – to his capital Samarkand[15, c. 250]. As a result, the Timurid court pooled talent from across the Islamic world. This is evident in the hybrid style of Timurid monuments, which combine Persian, Mesopotamian, and even Anatolian design elements with Central Asian traditions[6, p. 105]. The Timurids themselves celebrated this synthesis. In the words of one modern historian, Timurid architecture “blended Persian, Turkic, and Islamic art traditions” into a unique architectural language[6, p. 105]. For instance, the use of the four-iwan layout for madrasas and mosques – a Persian legacy – was adopted in Timurid Samarkand, but the Timurids enlarged the scale of each *iwan* (vaulted portal) and framed it with characteristically Central Asian flanking minarets, as seen in the Ulugh Beg Madrasa (1417–1420) at Registan Square.

The architectural achievements of Timur's reign (1370–1405) and that of his grandson Ulugh Beg and great-grandson Husayn Bayqarah include some of the most spectacular monuments in the Islamic world. A few examples illustrate the syncretic culmination of this era:

Gur-i Amir Mausoleum (Samarkand, 1403–1404): The tomb of Timur, Gur-i Amir, epitomizes the Timurid interpretation of the domed mausoleum. Like the Samanid Mausoleum, it is a domed square chamber serving as a royal crypt – but the Gur-i Amir is far larger and richly decorated. Its design features a majestic *pishtaq* portal at the front, flanked by two thin minarets, leading into a courtyard and then the domed chamber[9, p. 1]. The dome itself is a tall double-shell structure: an inner hemispherical dome and an outer onion-shaped dome that rises high on a cylindrical drum[8, p. 290]. This double dome on an elevated drum reflects influences from the 13th-century Ilkhanid architecture of Iran (e.g., the tomb of Öljeitü in Soltaniyeh) but was executed by local craftsmen with their own aesthetic touches[12, c. 48][7, c. 49]. The outer dome of Gur-i Amir, with its turquoise blue tiles arranged in spiraling ribbed segments, is a direct continuation of the Central Asian preference for colorful exteriors (a practice less common in early Persian tombs) and may also incorporate a memory of tent canopies (some scholars speculate that its shape was inspired by yurt or tent forms familiar to the Turco-Mongol culture)[7, c. 49]. Inside Gur-i Amir, one finds carved marble panels and painted stucco – techniques that hark back to pre-Islamic and Seljuk Persian interiors – alongside exquisite tile mosaics. Thus, the mausoleum marries the form established in the Samanid era with decorative and structural elaborations drawn from a wide geographic area, all synthesized by the Timurid vision of imperial grandeur.

Bibi Khanum Mosque (Samarkand, 1399–1405): Built by Timur to be one of the largest mosques in the Islamic world, the Bibi Khanum congregational mosque shows Timurid syncretism on a monumental urban scale. Its plan (a vast courtyard with *iwans* on each side and a dome over the

mihrab area) follows the classic Persian four-iwan schema[8, p. 290]. However, the scale was unprecedented in Central Asia: the main arch of the portal soared over 30 meters high. To construct it, architects had to push traditional techniques to their limits – the first attempt at the colossal dome and arch reportedly collapsed, illustrating the experimental nature of scaling up earlier designs[15, c. 250]. Eventually, the mosque was completed with slightly reduced dimensions. The decoration of Bibi Khanum was a tour-de-force of Timurid ornament: every surface was covered in glazed tile work, marble carving, or Quranic inscriptions. Contemporary accounts marvel that 10,000 worshippers could pray there at once[15, c. 250]. The mosque's lavish ornamentation – faience mosaics in geometric and floral designs – was made possible by the expertise of imported artisans from places like Khwarezm and Iran, combined with local artisans' knowledge of color and pattern. The result again is a fusion: structurally Persianate but aesthetically a kaleidoscope of Central Asian taste (especially the ubiquitous turquoise and azure tiles). In the words of art historians, during the Timurid period "the use of colour in architecture reached a high point. Every architectural unit was divided...into panels of brilliantly coloured tiles" covering both exterior and interior surfaces[8, p. 290].

Shah-i Zinda Necropolis (Samarkand, 14th–15th c.): This series of mausoleums, some built in the late 1300s and others in the mid-1400s, provides a microcosm of Timurid decorative syncretism. Each small mausoleum along the narrow alley exhibits a unique combination of tiles, *muqarnas* cornices, and carved terracotta. For example, the mausoleum of Turkan Aka (circa 1370s) features traditional brick patterning along with early examples of tile mosaic, while the later mausoleum of Shadi Mulk (1380s) and that of Qutlugh Oka (early 15th c.) are almost entirely clad in multi-color glazed tile from top to bottom, including motifs like eight-pointed stars and inscriptive bands that were part of the Persian decorative lexicon. The evolution visible at Shah-i Zinda – from brick-with-some-tile to walls as canvases of tile – encapsulates how Timurid decoration grew more exuberant, yet all these techniques were developments of what existed before. The Timurid artisans took the tile-making technology introduced in the 12th–13th centuries and perfected it, achieving an integration of epigraphy, geometry, and arabesque on building facades that was unprecedented[8, p. 290].

Overall, Timurid architecture can be seen as the zenith of the Islamic-local syncretism. It continued the tradition of Ilkhanid (Perso-Islamic) architecture but refined previous designs and techniques[12, c. 48] and magnified them. Timurid buildings retained the essence of Central Asian planning – e.g., preference for centrally-domed spaces, courtyards, and axial symmetry – while adopting refined Persian proportions and decorative complexity. The Timurids also introduced new structural engineering solutions: for instance, the widespread use of double domes on high drums (to achieve taller external profiles without making interiors too cavernous) was advanced in this period[8, p. 290][9, p. 1]. Double domes existed earlier (the Seljuks and Ilkhanids had used them), but Timurid architects dramatically increased the height of the supporting drum and the outer dome, as seen in Gur-i Amir and the later 15th-century dome of the Gawhar Shad Mosque in Herat[9, p. 1]. Additionally, the Timurid era saw an intersection of science and architecture – Ulugh Beg, Timur's grandson, was himself a mathematician and astronomer who likely influenced the precise geometric ornament and even the construction of observatories (e.g., the Ulugh Beg Observatory in Samarkand). This intellectual climate contributed to the exacting symmetry and sophisticated spatial composition of Timurid monuments (as evidenced in their intricate geometric patterns and layouts).

Notably, the Timurid architectural legacy was not confined to Central Asia. The style and techniques spread to other parts of the Islamic world. Mughal India, in particular, inherited Timurid architectural principles (Babur, the founder of the Mughal dynasty, was a Timurid prince). The Mughal architecture of the 16th century – such as the Humayun's Tomb in Delhi – directly drew inspiration from Timurid tomb architecture (the Gur-i Amir model) with its dome on a cube, *charbagh* garden setting, and glazed tile decoration[15, c. 250]. In Iran, the succeeding Safavid dynasty continued using the Timurid innovations in dome construction and tile ornament, albeit with modifications. Thus, the synthesis achieved under the Timurids in Māwarā'annahr had a pan-Islamic influence, seeding stylistic ideas far beyond their empire[6, p. 105].

In summary, the Timurid period elevated the syncretic architectural tradition of Central Asia to new heights of artistry. By integrating the craft traditions of the region (brickworking, wood carving, ceramic arts) with the institutional forms and decorative sophistication of the broader Islamic world (Persian mosques, madrasas, etc.), the Timurid builders created masterpieces that remain unparalleled. The fact that many of these 600-year-old structures – the blue-domed silhouettes of Samarkand and Herat – still astonish visitors today is a testament to the successful fusion of form and technique they embody.

DISCUSSION. The foregoing analysis reveals a clear through-line in Central Asian architecture: Islamic sacred architecture in this region developed not in isolation, but through continuous dialogue with local building traditions. Each period built upon the foundations of the previous, adapting and transforming what came before into new expressions suitable for the era's cultural and religious context.

During the early Islamic (Samanid) period, the blending of traditions was essentially a strategy of adaptation. The Arab-led introduction of Islam in the 8th century had brought new building types (e.g. mosques, minarets) which initially had no precedent in local architecture. The solution, as exemplified by the Samanids, was to adapt familiar forms – like the *chahar-taq* – to meet Islamic needs. This adaptation was likely quite intentional: it eased the acceptance of new religious monuments among a population that still included many recently Islamized people (and even remaining Zoroastrians)[2, p. 35][6, p. 105]. By the tenth century, patrons like Ismail Samani could commission a monument that was thoroughly Islamic in purpose yet embedded in local form, thereby asserting a new identity that was both Muslim and Central Asian. As Melanie Michailidis argued, the Samanid mausoleum synthesized key models from the Persian and Central Asian past into an innovative statement of Samanid dynastic legitimacy[1, p. 32]. In other words, architectural syncretism served as a visual narrative of cultural continuity – the past was quite literally built into the present.

In the Qarakhanid and later pre-Mongol period, this syncretic approach was reinforced and expanded. The Qarakhanid rulers, despite being of Turkic origin, embraced the settled urban culture of Transoxiana, including its architectural heritage[10, p. 2]. They maintained Bukhara and Samarkand as important centers and continued to adorn them with mosques and mausolea that followed established patterns. At the same time, being relatively new to the Islamic tradition, the Qarakhanids and other regional powers were open to experimentation – they introduced novel decorative ideas (as seen in brickwork innovations) that added a Turkic-Central Asian flair to the Islamic typologies. This indicates that syncretism is not a static blending but a dynamic process: each generation of builders

could contribute something new (new motifs, techniques) while preserving core inherited forms. By integrating their own aesthetic preferences (for example, a love of intricate geometries and perhaps nomadic symbolism) with the received Samanid models, the Qarakhanids ensured that the architecture evolved in a way that still felt “native” to the region. In fact, one could argue that by the 12th century, a recognizable Central Asian Islamic style had crystallized – characterized by baked-brick construction, geometric surface ornament, and the domed-square mausoleum as a dominant monument type[4, p. 1][6, p. 105]. This style was distinct from, say, contemporary architecture in Egypt or Anatolia, underscoring how regional syncretism produces diversity within the broader Islamic art world.

The Timurid era demonstrates syncretism in the service of imperial ambition. Timur and his successors deliberately harnessed the skills and artistic traditions of many lands to glorify their capital cities (Samarkand, and later Herat). The Timurid architectural style therefore was a grand synthesis of almost all Islamic architectural knowledge up to that time – the legacy of the Perso-Islamic Seljuks and Ilkhanids, the craftsmanship of Anatolia and Iran, and the deep local traditions of Māwarā’annahr[6, p. 105][12, c. 48]. What is remarkable is how coherently these elements merged. Rather than appearing as patchwork, Timurid monuments exhibit a high degree of unity and identity. This suggests that Central Asia’s prior experience over centuries in blending traditions had created a flexible, syncretic design culture capable of absorbing new influences smoothly. For example, when Timurid architects incorporated the Persian four-iwan mosque plan, they did so in a way that harmonized with the Central Asian preference for monumental portal axes and decorative brickwork, yielding structures that felt both new and rooted. Abobakirov (2025) highlights that Uzbek architecture historically “preserved its indigenous identity while selectively incorporating external features, producing hybrid styles that reflect both resilience and adaptability”[5, p. 169]. This observation is borne out by the Timurid case, where we see a conscious preservation of indigenous identity (e.g., continued use of pre-Islamic decorative symbols like the astral motifs, or the maintenance of traditional spatial concepts like courtyards oriented to the four cardinal directions as in ancient Central Asian cities) within a new monumental framework inspired by global Islamic norms.

Another important aspect is the symbolic or ideological dimension of this syncretism. Architecture in these periods was often a statement of political theology. The Samanids promoted themselves as revivalists of Persian culture (the so-called “Persian Renaissance” in the 10th century) and protectors of Islam – their architecture symbolized this dual role[3, p. 92]. The Qarakhanids, as new Muslims, may have used architecture to signal their Islamic legitimacy through emulation of venerable models (hence rebuilding the venerable Friday mosques of Bukhara and Samarkand). The Timurids, for their part, were empire-builders who desired to legitimize their rule over diverse peoples; by creating monumental architecture that was a microcosm of their cosmopolitan empire, they visually reinforced their claim to be heirs of all the great civilizations of their realm (Turkic, Persian, Mongol, Islamic)[12, c. 48]. The monumental scale itself – the gigantic mosques, lofty domes, and spacious gardens – conveyed a universalistic imperial ideology, yet the incorporation of local motifs (such as the tile patterns unique to Samarkand or the use of Kufic calligraphy in brick typical of earlier Central Asian style) rooted that ideology in local soil.

It is also worth noting the role of continuity in fostering later heritage preservation. Because Timurid architecture retained so many aspects of earlier buildings, later generations were able to recognize these monuments as culturally their own. Even after the Timurid dynasty faded, the people of Central Asia (under the Shaybanids and others) continued to cherish Timurid-era structures, restoring and maintaining them, and building new monuments “in the Timurid spirit”[13, b. 285]. For instance, 16th-century Shaybanid architecture in Bukhara, such as the Mir-i Arab Madrasa, continued using the high *pishtaq* and domed chamber formula – directly inherited from Timurid prototypes – thus prolonging the life of the medieval syncretic style[13, b. 285]. The syncretic architecture became a core part of Central Asian identity; its endurance can be seen today, as Uzbekistan proudly conserves sites like the Ismail Samani Mausoleum and the Registan, regarding them as touchstones of national heritage. In the words of G. A. Pugachenkova, the religious monuments of Samarkand and Bukhara stand as symbols of the greatness of the region’s cultural history, justifying the extraordinary efforts that were invested in their construction[7, c. 49]. They represent a successful blending of spiritual and artistic aspirations across eras.

Finally, examining this topic contributes to the broader understanding of how regional architectural schools form within the Islamic world. The case of Central Asia from the Samanids to Timurids exemplifies a pattern seen elsewhere: the indigenization of Islamic architecture. Much as in Spain, North Africa, or India, where Islamic architecture absorbed local flavors (creating Mudéjar, Maghrebi, and Indo-Islamic styles, respectively), in Central Asia a Mawarannahr style emerged. It reminds us that Islamic art is not monolithic; it is a family of styles, each shaped by local conditions. Central Asia’s contributions – especially in decorative brickwork and glazed tile, and the perfected form of the domed mausoleum – became an integral part of Islamic architecture as a whole.

CONCLUSION. From the Samanid era to the Timurid epoch, the architecture of Central Asia illustrates a continuous and fruitful synthesis of Islamic and local building traditions. Early Islamic rulers in Transoxiana adopted local architectural forms – such as ancient fire-temple layouts and traditional decorative motifs – to create some of the first monumental expressions of Islam in the region[2, p. 35][1, p. 32]. Their Qarakhanid successors built on this foundation, enriching the style with new patterns and techniques yet still working firmly within the established vernacular of baked brick and geometric ornament[10, p. 2][4, p. 1]. Under the Timurids, this melding of traditions reached its fullest flowering: Timurid architecture achieved a sophisticated balance whereby imported ideas from the broader Muslim world were harmoniously merged with Central Asian craftsmanship and aesthetics to produce works of outstanding global importance[6, p. 105].

The syncretic evolution of Central Asian architecture was not a mere blending for its own sake, but a creative engine that drove architectural innovation for over five centuries. It enabled the preservation of pre-Islamic cultural identity within an Islamic framework, as seen in the enduring use of local materials, layouts, and motifs. At the same time, it gave Central Asian architects the flexibility to absorb new influences – from Persian dome technology to Mongol-Chinese artistic elements – without losing their unique style. The legacy of this fusion is a rich architectural heritage that includes some of the most revered monuments of the Islamic world. Today, the brick mausoleum of Ismail Samani with its timeless design and the majestic turquoise domes of Samarqand’s Registan and Bibi Khanum mosque stand as testaments to a successful marriage of civilizations. They exemplify how

regional architecture can be at once firmly rooted in local tradition and elevated by universal artistic ideals. In the grand narrative of Islamic art, the example of Central Asia's syncretic architecture from the Samanids to the Timurids highlights the importance of cultural adaptation and continuity – a lesson in how diversity within unity can produce enduring masterpieces.

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XOTIN-QIZLAR BANDLIGINI OSHIRISHDA KICHIK BIZNES VA XUSUSIY TADBIRKORLIKNING O'RNI

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Buxoro viloyat hokimligi boshqaruv apparati viloyat hokimi

o'rinbosari-oila va xotin-qizlar boshqarmasi boshlig'i kotibiyat mudiri

Annotatsiya. Mazkur maqolada xotin-qizlar bandligini ta'minlashda kichik biznes va xususiy tadbirkorlikning o'rni tahlil qilingan. Unda O'zbekiston Respublikasida ayollar iqtisodiy faolligini oshirish, ularni tadbirkorlikka jalb etish bo'yicha amalga oshirilayotgan islohotlar, davlat dasturlari va imtiyozlar tahlil etiladi. Shuningdek, xotin-qizlarning ish bilan ta'minlanishida kichik biznes subyektlarining samaradorligi, yangi ish o'rinlari yaratishdagi ahamiyati va bu jarayonda duch kelinayotgan muammolar hamda ularning yechimlari yoritilgan. Tadqiqot natijalari xotin-qizlar bandligini oshirishda tadbirkorlik muhitini yanada yaxshilash, moliyaviy qo'llab-quvvatlash tizimini rivojlantirish va kasbiy tayyorgarlikni kuchaytirish zarurligini ko'rsatadi.

Kalit so'zlar xotin-qizlar bandligi, kichik biznes, xususiy tadbirkorlik, iqtisodiy faollik, tadbirkorlik muhiti, gender tengligi, davlat dasturlari, yangi ish o'rinlari, ijtimoiy-iqtisodiy rivojlanish.

Global miqyosda barqaror rivojlanishning asosiy ustunlaridan biri gender tengligini ta'minlash hamda xotin-qizlarning iqtisodiy faolligini oshirish bilan bog'liq. Birlashgan Millatlar Tashkilotining "Barqaror rivojlanish maqsadlari – 2030" dasturida bu masala alohida yo'nalish sifatida 5-maqsadda "Gender tengligini ta'minlash" va 8-maqsadda "Barqaror iqtisodiy o'sish, bandlik va munosib mehnatni ta'minlash" belgilangan.[1] Mazkur maqsadlarni amalga oshirishda kichik biznes va xususiy tadbirkorlik ayollarni iqtisodiy faol hayotga jalb etish, ularning daromad manbalarini kengaytirish hamda ijtimoiy tenglikni ta'minlashda eng samarali vositalardan biri sifatida e'tirof etiladi. Rivojlangan mamlakatlar tajribasi shuni ko'rsatadiki, ayollar tadbirkorligini qo'llab-quvvatlash nafaqat ularning iqtisodiy mustaqilligini kuchaytiradi, balki butun jamiyatning ijtimoiy-iqtisodiy barqarorligiga ijobiy ta'sir ko'rsatadi.

Mamlakatimizda iqtisodiy taraqqiyot, aholining farovon turmush darajasi va barqaror o'sishni ta'minlashda xotin-qizlarning faol ishtirokini kengaytirish davlat siyosatining muhim yo'nalishiga aylangan. So'nggi yillarda kichik biznes va xususiy tadbirkorlikni rivojlantirishga qaratilgan chora-tadbirlar, jumladan, imtiyozli kreditlar, grant dasturlari va konsalting xizmatlari orqali xotin-qizlar uchun keng imkoniyatlar yaratilmoqda.[2] Natijada, ayollar o'rtasida tadbirkorlik faolligi sezilarli oshib, ularning bandlik darajasi ham ortmoqda. Bu esa, o'z navbatida, milliy iqtisodiyotning diversifikatsiyasiga, yangi ish o'rinlari yaratilishiga va ijtimoiy barqarorlikning mustahkamlanishiga xizmat qilmoqda.

Aholimizning 18,0 milliondan ortiq 49,7 foizini xotin-qizlar tashkil etishini hisobga olsak, yurtimizdagi ijtimoiy maslalarining aksariyati ular hayoti bilan chambarchas bog'liq.[3] So'nggi yillarda ayollarni ijtimoiy himoyalash, ular uchun doimiy ish joyini yaratish va bandligini ta'minlash masalasi davlat siyosati darajasigacha ko'tarilib, bu borada mahalla darajasigacha yuritiladigan vertikal tizim yaratildi. Davlatimiz rahbarining 2020 yil 8-oktabrdagi jamiyatda ayollar va yoshlarning rolini oshirish hamda bandligini ta'minlash chora-tadbirlari muhokamasi yuzasidan

o'tkazilgan videoselektor yig'ilishidagi tashabbusi bilan xotin-qizlar masalalari bo'yicha yangi ish tizimi – har bir mahalla, tuman, shahar va viloyat kesimida “Ayollar daftari” joriy etildi.

Kichik biznes va xususiy tadbirkorlikni rivojlantirish va xotin-qizlar bandligini oshirishda uning roli va afzalliklari ilmiy tarzda o'rganishga oid muammolar turli davlatlarda turli yechimga ega bo'lgan. Masalan, g'arbda taniqli iqtisodchi olimlar E.Giddens, G.Sillaste, T.Parsonning ilmiy ishlarida ayollar mehnatining rolini oshirish bo'yicha ilmiy-nazariy yondashuvlar ishlab chiqilgan. Amerikalik sotsiolog olimlar L.Vard, B.Tomos, A.Kante va G.Spenser kabilar ham o'z ilmiy qarashlarida ayollar mehnatidan samarali foydalanish va buning natijasida iqtisodiyotning rivojlanishiga turtki beruvchi g'oyalarni aytib o'tganlar.

Rossiyalik olimlar E.N.Fetshov, P.Sorokin, M.Rivkin, T.Zaslavskaya va L.Babayevalarning ayollar mehnatidan foydalanish masalalari bo'yicha olib brogan ilmiy ishlarini alohida ta'kidlash mumkin.

O'zbekistonda kichik biznes va xususiy tadbirkorlikni rivojlantirishda ayollar mehnatidan foydalanish masalalariga oid nazariy va amaliy muammolar R.Ubaydullayeva, D.Raximova, M.Sobirova, S.Qosimova kabi olimlarning ishlarida ayollar mehnatidan foydalanishning o'ziga xos jihatlari yoritilgan.

O'zbekiston Respublikasi Prezidenti Sh.Mirziyoyev tomonidan mamlakatimizda ayollar uchun doimiy ish joyini yaratish bilan birga oilaviy biznes kasanachilik, hunarmandchilik, tomorqa xo'jaligini keng rivojlantirish ishlari bo'yicha juda kata ishlar amalga oshirilib, kichik biznesning ayollar bandligini oshirishdagi roli kuchaytirildi.

Jahon miqyosida aholining iqtisodiy faolligini gender yondashuvlari asosida tahlil qilsak, ayollarning mehnatda bandligi tobora ortayotganligini alohida qayd etish joiz Ayniqsa O'zbekiston aholisining iqtisodiy faolligida ayollarning salmog'i boshqa davlatlarga nisbatan yuqori (1-jadval).

1-jadval

Aholining iqtisodiy faolligi to'g'risida, %[4]

Hudud miqyosi	Ayollar	Erkaklar
Dunyo bo'yicha	53,1	80,3
Rivojlangan mamlakatlarda	50,4	67,5
O'tish davridagi mamlakatlarda	51,0	70,5
O'zbekistonda	68,9	72,5

Dunyo miqyosida ayollarning iqtisodiy faolligi past ko'rsatkichlarda namoyon bo'layotgan bo'lsa, O'zbekistonda ayollarning iqtisodiy faolligi ko'rsatkichi, rivojlangan yoki o'tish davridagi mamlakatlardan yuqoridir. Jumladan iqtisodiyotda band bo'lgan ayollar ulushi 45 %ga yetgani hamda ular orasida aholi turmush farovonligini oshirishda ibrat ko'rsatilib, minglab ayollarimiz tadbirkorlik sohasining turli yo'nalishlarida ishlab chiqarish korxonalarini ochib, xotin-qizlar uchun yangi ish o'rinlari yaratilayotganini alohida ko'rsatish kerak.

“Ayollar tadbirkorligi Global indeksi” butun dunyoda ayollar tadbirkorligi rivoji istiqbollari o'lcha beradi. Ayollar tadbirkorligi rivoji sifatida 3 ta omil, ya'ni tadbirkorlik muhiti; tadbirkorlik ekotizimi va ayollarning tadbirkorlik bilan shug'ullanish istaklari belgilab beradi.

Ayollarning tadbirkorlik tashabbuslarini qo'llab quvvatlash, ularda biznes asoslari va kasb-hunarga o'qitish hamda tadbirkor ayollarni huquqiy jihatdan qo'llab quvvatlash maqsadida 1991 yildan faoliyat yuritib kelayotgan “Tadbirkor ayol” uyushmasi muhim ahamiyatga ega. Uyushmaning 14 ta

hududiy bo'limlari, 68 ta tuman va shahar bo'linmalari mavjud bo'lib o'zida 15000 dan ortiq tadbirkorlik sub'yektlari birlashtirgan. Uyushmada 200 ga yaqin mutaxassislar xotin-qizlarning tadbirkorlik harakatini rivojlantirish, ularning iqtisodiy bilimlarini oshirish, qayta kasbga tayyorlash, oilaviy tadbirkorlikni keng targ'ib etish orqali arollarning foydali mehnat bilan bandligini ta'minlashga munosib hissa qo'shib keldi.[5]

Bugungi davr, zamonaviy shart-sharoit, amaliy hayotning o'zi turmush tarzini boyitishning bosh mezon sifatida tadbirkorlik va kichik biznes bilan shug'ullanishni, farovon hayotni asosi sifatida maydonga olib chiqmoqda. Bu borada oilaviy tadbirkorlik bandlikni ta'minlash, aholi farovonligini yuksaltirish eng muhim omillardan bo'lib, u milliy iqtisodiyotning tayanchi va harakatlantiruvchi kuchi hisoblanadi.

Shuni alohida, ta'kidlash kerakki, oilaviy tadbirkorlikning o'ziga xos xususiyati, u ko'p asrlik oilaviy an'analar, qadriyatlar bilan uyg'un tarzda rivojlanadi. Bu an'anaviylik qishloqlarda, katta shaharlarda asrlar davomida mavjud bo'lgan. Ko'pgina oilalar an'anaviy tarzda birgalikda hunarmandchilik bilan mashg'ul bo'lishgan va oila har bir a'zosining o'z o'rni va roli bo'lgan.

Qayd etish lozimki, bugungi kunda oilalar daromadining 4/1 qismidan ortig'i tadbirkorlik evaziga topilmoqda. Davlatimiz tomonidan bu ko'rsatkichni yanada oshirish, oilalar daromadini 50% ehtiyoji tadbirkorlik evaziga qoplanishiga erishishni masalasi qo'yilgan.

Yevropa mamlakatlarida bir ishlovchiga 0,7 kishi mehnat yoshiga yetmagan bolalar va nafaqadagi keksalar to'g'ri kelsa, bu ko'rsatkich Respublikamizda 2,5 kishini tashkil qiladi. Bunday sharoitda albatta, faqat oylik maosh bilan oilaning ehtiyojlarini qondirib bo'lmaydi. Shuning uchun ham bugungi kunda oilaviy biznes, tadbirkorlikni rivojlantirishga katta ahamiyat berilmoqda.

Kichik biznes va xususiy tadbirkorlikni rivojlantirish uchun muhim omil bo'lib soliq stavkalarining kamaytirilishi, imtiyozli kreditlar miqdorining oshib borishi, ishbilarmonlik muhitining yaratilishi hisoblanadi.

O'zbekiston 2019 yilda xalqaro "Doing Business" reyting ko'rsatkichida jahon miqyosida biznes yuritishga qulay sharoit yaratilgan 20 talik safiga kirgani yuqoridagi mulohazaning mantiqiy tasdig'i bo'lib hisoblanadi. Xalqaro tashkilotlar, xususan, Jahon Banki, Xalqaro valyuta fondi va boshqalar o'z ma'ruza va chiqishlarida keyingi yillarda tadbirkorlik faoliyati uchun ishbilarmonlik muhitini yaxshilash borasida eng yaxshi natijalarga erishgan davlatlar qatoriga chiqqanligini etirof etishmoqdalar.

O'zbekiston ishbilarmon ayollarining "Tadbirkor ayol" uyushmasi mamlakat iqtisodiyotida bozor munosabatlarini joriy etishda xotin-qizlarning faol ishtirok etishi uchun qulay shart-sharoitlar yaratib, ularning tadbirkorlik tashabbuslarini qo'llab-quvvatlash, biznesda huquq va manfaatlarini himoya qilish kabi ko'plab ahamiyatga molik ishlarni amalga oshirmoqda.

"Tadbirkor ayol" uyushmasi avval boshida ayollar tadbirkorligi istiqbollari

namoyon etish maqsadida 1991 yilda o'n ikki nafar tadbirkor ayol tomonidan tashkil etilgan bo'lib, respublikada xotin-qizlar tadbirkorligining ijobiy salohiyatini ochib berishni o'z oldiga maqsad qilib qo'ygan edi. Ushbu ishbilarmon ayollar uyushmasi birligi yo'lida 14 viloyat, 62 ta hududiy filiallari yagona tarmoqqa birlashtirgan bo'lib, unda 200 ga yaqin mutaxassis ayollar tadbirkorligini kengaytirishga hissa qo'shmoqda, iqtisodiy rivojlanish va himoya qilish uchun sharoit yaratmoqda, xotin-qizlarning ijtimoiy huquqlari, ularning tadbirkorligini va ijtimoiy tashabbuskorligini qo'llab-quvvatlash, innovatsiyalarni joriy etish orqali moliyaviy va axbirot resurslaridan foydalanishni

ta'minlashga yordam berish, oilaviy tadbirkorlikni rivojlantirish orqali iqtisodiy bilimlarni oshirish, kasbiy qayta tayyorlash va xotin-qizlarni foydali ish bilan ta'minlash uchun turli ta'lim dasturlarini amalga oshirilmoqda.

Uyushmaga hozirgi kunda 70000 ga yaqin tadbirkor ayol a'zo bo'lib, ular o'z faoliyatlari davomida jami 70000 dan ziyodroq ish o'rinlarini tashkil qilishdi. SHuningdek, 2017 yilga qadar 14000 dan ziyod xotin-qizlarga biznes yuritish asoslari o'gatildi, ishsiz bo'lganlarga kasb-hunar egallashlariga amaliy yordam berildi va hokazo. Bu kabi say-harakat shubhasiz,

Respublikada, nafaqat O'zbekistonda balki, xalqaro miqyosda ham namunali nodavlat jamoat uyushmasi sifatida qayd etildi. Masalan, 2012 yilda ushbu uyushma BMT ning Xotin-qizlar manfaati yo'lidagi taraqqiyot jamg'armasining (YUNIFEM) maxsus mukofoti, "Kasbga o'qitish va mikroreditlash orqali xotin-qizlarning iqtisodiy mavqeini oshirishga ko'maklashish" yo'nashi bo'yicha mazkur tashkilotning sertifikatini va mukofotlariga sazovor bo'lgan edi.[7]

Bozor iqtisodiyoti sharoitida aholini turmush tarzi, ayniqsa, qishloq hududidagi aholi, xususan xotin-qizlar, ko'p bolali oilalarni iqtisodiy ahvolidagi ham tabiiyki, o'zgarishlar sodir bo'ldi. Ushbu o'zgarishlar bozor iqtisodiyoti sharoitida xotin-qizlarni ushbu sharoitga moslashtirish, bu yo'nalishda tegishli chora-tadbirlar ko'rish muhim ahamiyat kasb etadi. Bu borada xotin-qizlar uy sharoitidan ajralmagan holda mehnat qilishi uchun juda ahamiyatli bo'lib hisoblanadi. SHu boisdan ham ularni kasanachilik bilan mashg'ul bo'lishlari xotin-qizlarning o'zlari uchun juda maqbuldir.

Shu o'rinda kasanachilik haqida shuni alohida ta'kidlash lozimki, kasanachilik - daromad keltiruvchi mehnat faoliyati sifatida XVIII-XIX asrlardagi sanoat inqiloblari davrida zamonaviy tus olgan bo'lib, bunda yirik korxonalar iqtisodiy maqsadga muvofiqligi nuqtai nazaridan mahsulotlar ishlab chiqarish va mehnat jarayonlarining muayayn qismini aholining uy xo'jaliklariga joylashtirgan. O'sha davrlardan kasanachilikning iqtisodiy jihatdan maqsadga muvofiqligi, birinchidan, korxonalarda ko'p mehnat bilan shug'ullanuvchi xodimlar band qilgan ishlab chiqarish maydonlari bo'shishi, ikkinchidan, ijtimoiy muhofazani talab qilmagan arzon ishchi kuchidan foydalanish, uchinchidan, mahsulot sifati va uni standartlashtirish tartibiga qaratilishi belgilangan.[7]

XX asrga kelib esa G'arb mamlakatlarida, ayniqsa, Janubiy-sharqiy Osiyoning jadal rivojlanayotgan mamlakatlarida (Osiyo yo'lbarlari) da uy mehnati yangi sifatda yuzaga chiqdi. Natijada yirik korxonalar va individual ishlab chiqaruvchilar orasida mehnat shartnomalariga asoslangan kooperatsiya shakllandi.

O'zbekistonda ham iqtisodiyotni modernizatsiyalash va islohotlarni yanada chuqurlashtirish sharoitida kasanachilik sifat jihatidan yangi ko'rinishda yuzaga keldi. O'zbekiston Respublikasi Prezidentining "Kasanachilikni yanada rivojlantirish uchun qulay sharoitlar yaratish chora-tadbirlari to'g'risida"gi 2017 yil 24 may Qarori, "Har bir oila - tadbirkor" dasturini amalga oshirish to'g'risida"gi 2018 yil 7 iyun PQ-3777-son Qarori kabilar qabul qilindi. Bular orqali korxona buyurtmasiga ko'ra mehnat faoliyati yurituvchi fuqaro va korxona orasidagi kooperatsiya shakli joriy qilindi.

Mehnat faoliyatining bu shaklidan unumli foydalanish, birinchidan qishloq joylarida o'tkir bo'lib turgan ishsizlik muammosini hal etishga imkon beradi, ikkinchidan u yoki bu sababga ko'ra ishlab chiqarishda ishtirok eta olmaydigan ayollar uchun ishlash imkoniyati yaratiladi, uchinchidan, kasanachilikning maoshi oila byudjetiga qo'shimcha bo'lib, daromad oshirishga olib

keladi va nihoyat insonlarning, ayniqsa ko‘p bolali ayollarning ishiga, bunyodkorlik faoliyatiga bo‘lgan ehtiyoji qondiriladi.

Umuman olganda, xotin-qizlar iqtisodiy faoliyatida biznes va tadbirkorlikni rivojlantirish, bu orqali bandlikni ta‘minlash, kichik biznes orqasidan iqtisodiy ta‘minlanganlik, o‘z ichki imkoniyatlarini ro‘yobga chiqarish, iqtisodiy jihatdan avvalo o‘zini, oilasini shu orqali jamiyatni boyitishi, ko‘plab kishilarni foydali mehnat bilan band qilish, ijtimoiy hayot bobida inson mehnatidan qoniqish lozimligi hissi kabi ijobiy jihatlarni yuzaga chiqarib, iqtisodiy barqarorlikka zamin bo‘lib xizmat qiladi.

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MA'RIFATPARVAR AJDODLARIMIZNING IBRATLI FAOLIYATI

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"Mushtarak tariximizning yorqin sahifalarini tashkil etadigan ma'rifatparvar ajdodlarimizning ibratli faoliyatini, ularning o'z qimmatini va ahamiyatini hamon yo'qotmasdan kelayotgan boy merosini hamkor davlatlar hamda xalqaro tashkilotlar vakillari, taniqli xorijiy olimlar bilan birgalikda teran tadqiq va targ'ib etish bizning ustuvor vazifamizdir."

SHavkat Mirziyoev

Ma'rifatparvar ajdodlarimizning ilg'or g'oya va qarashlarini tadqiq etish va tizimlashtirish, Turkiston jadidlarining milliy davlatchilik rivojidadagi o'rni va ta'sirini o'rganish, XX asrning birinchi choragida ular tomonidan barpo etilgan davlat tuzilmalarining qonunchilik bazasini tahlil qilish, dunyoviy, huquqiy va demokratik jamiyat qurishga qaratilgan faoliyatiga tarixiy baho berish, mamlakatimiz kelajagini bunyod etishda ushbu merosning mustahkam poydevor bo'lib xizmat qilishi bilan bog'liq masalalar alohida ahamiyatga ega.

Jahon xalqlarining ijtimoiy-iqtisodiy taraqqiyoti mislsiz darajada rivojlanib, globallashtirish jarayonining qamrovi g'oyat keng ko'lamda kuchayib borayotgan hozirgi davrda insoniyat kelgusi hayotga, ayniqsa, dunyo sivilizatsiyasining taqdiri va barqarorligiga ulug' ajdodlarimiz tomonidan yaratilgan bebaho ilmiy-adabiy, ma'naviy-madaniy merosni keng ko'lamda o'rganish va targ'ib etish bilan bevosita bog'liq bo'lib turibdi.

Muhtaram Prezidentimiz SHavkat Mirziyoev rahnamoligida O'zbekistonda YAngi Uyg'onish davri, ya'ni Uchinchi Renessans poydevorini yaratish eng asosiy maqsad qilib qo'yildi. SHu boisdan ham eng avvalo, Uchinchi Renessansning mazmunmohiyatini har birimiz chuqur va teran anglab olishimiz nihoyatda zarur.

Mamlakatimizda Uchinchi Renessansni XX asrda ma'rifatparvar jadidlar amalga oshirishlari mumkin edi. Nega deganda, bu fidoyi va jonkuyar zotlar butun umrlarini milliy uyg'onish g'oyasiga bag'ishlab, o'lkani jaholat va qoloqlikdan olib chiqish, millatimizni g'aflat botqog'idan qutqarish uchun bor kuch va imkoniyatlarini safarbar qildilar. SHu yo'lda ular o'zlarining aziz jonlarini ham qurbon qildilar va ular **"Ilmdan boshqa najot yo'q va bo'lishi ham mumkin emas"** degan Hadisi sharifni hayotiy e'tiqod deb bildilar. Milliy istiqloq, taraqqiyot va farovonlikka, avvalo, ma'rifat orqali, dunyoviy va diniy bilim, zamonaviy ilmhunarlarni chuqur egallash orqali erishish mumkin, deb hisobladilar.

Bu davrda Abdulla Avloniy, Mahmudxo'ja Behbudiy, Munavvarqori Abdurashidxonov, Ubaydulla Xo'jaev, Abdurauf Fitrat, Ibrat domla, Abdulhamid CHO'lpon, Abdulla Qodiriy, Ashurali Zohiriy, Hoji Muin va boshqa yana yuzlab ulug' insonlar milliy uyg'onish va millatparvarlik harakatining oldingi saflarida turdilar. Ular yangi usul maktablari bilan bir qatorda, odamlarning dunyoqarashi va turmush tarzini o'zgartirishga qaratilgan gazeta-jurnallar, nashriyot va kutubxonalar, teatrlar tashkil etdilar.

Jadidlarimiz o'z oldiga qo'ygan ezgu maqsadlarni amalga oshirishga mavjud vaziyat, ijtimoiy tuzum yo'l bermagandi. Ular o'sha davrning turli kimsalarining tuhmat-malomatlariga duchor bo'ldilar.

Dastlab Rossiya hukumati, keyinchalik sho‘rolar ularni ayovsiz quvg‘in va qatag‘on qilgandi. Lekin, bu milliy uyg‘onish va taraqqiyot harakati Vatanimiz tarixida yorqin xotira sifatida qoldi. YUrtimiz ozodligi va xalqimiz baxt-saodati yo‘lida jonini fido qilgan jadidlarning ilmiy-ma‘rifiy, adabiy-badiiy merosi hozirgi davrda ham katta ahamiyatga ega.

SHu o‘rinda ta‘kidlab o‘tish lozimki, XX asrning 30-yillarida e‘lon qilingan qator maqola va kitoblarda birinchi galda jadidlar qoralanar, keyingi harakatlar Abdulla Qodiriy nomiga bog‘lanardi. J.SHarifiy, Olim SHarafiddinov maqolalarida jadidlar “aksilinqilobchi”, “Sovetlarga qarshi”, “Reaksion kuchlarni birlashtirgan”, “bosmachilarga rahnamolik qilgan” degan uydirmalar to‘qib chiqarildi. Bunday fikrni birinchi bo‘lib, Sotti Husayn bayon qilib shunday degan edi: *“jadidlar oktyabrdan keyin o‘zlarining sobiq inqilobiy fikrlarini burib proletariyatga qarshi aksilinqilobiy adabiy kuch bilan chiqdilar”*[1].

Ma‘rifat istagan jadidlar eski diniy maktablarga dunyoviy fanlar kiritish va o‘qitish metodikasini o‘zgartirish yo‘li bilan ularni isloh qildilar. Mustabid Sovet tuzumi ushbu islohotni yuzaki rasmiy islohot deb, uning mafkurachilarini dunyoviy fanlarni dinga bo‘ysundirishda aybladilar. SHuningdek, yangi usul jadid maktablari ham burjua millatchiligi ruhi bilan sug‘orilgan deb topildi.

Jadid ziyolilarining mafkurasida Turkistonni o‘rta asrlarga xos qoloqlik va diniy xurofotdan ozod etish, shariatni isloh qilish, xalqqa ma‘rifat tarqatish, milliy muxtoriyat hukumatini barpo etish uchun kurash, Buxoro va Xivada konstitutsion monarxiya va parlament, keyinchalik demokratik respublika tuzumini o‘rnatish orqali ozod va farovon jamiyat qurish, barqaror milliy valyutani joriy qilish hamda milliy qo‘shin tuzish bo‘lgan. Ularning Turkiston mustaqilligi uchun kurashida asosan quyidagi yo‘nalishlar ustuvor bo‘lgan: yangi usul maktablari tarmog‘ini kengaytirish, qobiliyatli yoshlarni chet elga o‘qishga yuborish; turli ma‘rifiy jamiyatlar va teatr truppalari tuzish; gazeta va jurnallar chop qilish, xalqning ijtimoiy-siyosiy ongini yuksaltirish bilan Turkistonda milliy demokratik davlat qurish. Jadid ziyolilarining kuchli partiyasi tashkil qilingan taqdirdagina bu ishlarni amalga oshirish mumkin edi. Jadidlar siyosiy ishlar – haq-huquq, milliy davlat, hokimiyat masalalari bilan muntazam shug‘ullandilar. Ayni paytda, maktab-maorif isloh qilina boshlandi. Milliy matbuot yo‘lga qo‘yildi. Teatr paydo bo‘ldi. YAngi adabiyot shakllandi, bir so‘z bilan aytganda, yangi tafakkur maydonga keldi. Bu – millatning o‘zligini anglash va mustaqillik mafkurasini edi [2].

Biz so‘z yuritayotgan davrga kelib bolsheviklar mafkurasiga qarshi kurash nafaqat O‘zbekiston va boshqa sovet respublikalarida, shuningdek, inqilob markazi hisoblangan Rossiyaning o‘zida ham mavjud edi. Ayniqsa, muxolif marralar bolshevizm mafkurasining iqtisodiy tomonlariga keskin qarshi edilar. Fuqarolar qo‘lidagi mol-mulk, er va boyliklar zo‘ravonlik bilan, yanada aniqroq aytganda proletariatcha hujum natijasida tortib olingan edi. 1925 yil partiya Markaziy qo‘mitasi o‘sha vaqtda Buxarin maydonga aytgan va “Komsomolskaya Pravda” yoqlab chiqqan “boy bo‘lingiz” shiorini Stalin tashabbusi bilan qoralagan edi. Stalin aytishicha, bu narsa “aslida kapitalizmni tiklashga chaqirish” edi [3].

O‘z o‘rnida bolsheviklar o‘zlarining mafkuralarini matbuot orqali o‘tkazish uchun kurashganlar. Ular milliy ziyolilarni kundalik gazeta, jurnal hatto chiqarilgan kitoblarini tanqid qilganlar va har xil usul vositalar bilan kuchli bosim o‘tkazganlar. Kommunistik partiyaning yig‘ilishlarida mafkura masalasida yo‘l qo‘yilgan kamchiliklar bir necha bor muhokama qilingan. Ushbu muhokamalarda ziyolilarga qarshi qanday usul va vositalar bilan g‘oyaviy kurash olib borish lozimligini qayd etganlar. SHu o‘rinda mafkura masalasida yo‘l qo‘yilgan kamchiliklar tahlil qilingan [4].

Sovet mafkurasiga xizmat qilishni istamagan milliy ziyolilar faoliyati bolsheviklar tomonidan muntazam nazorat qilingan. Milliy ziyolilardan Munavvar Qorining faoliyati bir necha marotaba muhokama qilinib, shunday keltirilgan: “Keyingi vaqtlarda Munavvar Qorining ikkinchi bosqich maktablari uchun yozilgan kitobining ikkinchi bo‘limida firqamizning hozirgi siyosatiga to‘g‘ri kelmaydigan narsalar va mayda bolalarning miyasini zaharlaydigan jumlar yozilgan edi. Bundan bizning xabarimiz bo‘lmagan. Chunki bu ish hukumatimizning boshqa ishlar bilan ovora bo‘lib bularning shu harakatlariga yaxshi ahamiyat bermaganligidan bo‘lsa, ikkinchidan ko‘proq o‘zimizning maorif xodimlari davlat nashriyotida o‘tirgan kishilarning rahbarlari bu ishga ahamiyat bermaganligi, kitobning rasmiy tomonini ko‘rib chiqib, mafkuraviy jihatiga ahamiyat bermaganligi bo‘lib chiqadi. Ular o‘zlarining buzuvchi mafkurasi bilan bolalarni tarbiyalamoqdalar. Hozirda ham bunday ishlarni to‘xtatganlari yo‘q” [5].

Mamlakatda ziyolilarning partiya oldidagi xizmatlari unumli bo‘lishi mamlakatda hokimlik qiluvchi ishchilar sinfi mafkurasiga qanchalik yaqin turishiga bog‘liq ekanligi ko‘rsatib o‘tilgan. Ular sovet ziyolisini mafkura maydonida yo‘l qo‘yayotgan kamchiliklarini quyidagi 3 asosiy xususiyatini keltiradilar:

“Birinchisi – sho‘ro ziyolilarining marksizm bilan yaxshi tanish bo‘lmaganliklari; ikkinchisi – bular safida millatchilik ruhi borligi; uchinchi – ziyolilarimiz ichida siyosatdan chetda turishning mahkam ildiz otganligi” [6].

Sovet davlati milliy masalaga proletarcha ruhda yondashib, jamiyatni ezuvchi va eziluvchiga, boylar va kambag‘allarga ajratdi, milliy manfaatlarning va milliy munosabatlarning murakkab va xilma-xil ekanligini unitib, uning muttasil rivojlanib hamda chuqurlashib borishini e‘tiborga olmadi. Natijada tor milliy manfaatlar atrofida o‘ralashib qolish holatlari yuzaga keldi. Sovet davlatining “sotsializm qurishning sharti” bo‘lgan milliy avtonomlashtirish siyosatiga qarshi chiqqanlar “xalq dushmanlari” deb, ataldi. SHu tariqa “proletar internatsionalizmi” g‘oyasi yuzaga keldi. Sovet davlatining nazariy asoslari qurilayotgan vaqtda proletariat diktaturaning asoschisi V.Lenin chizib bergan yo‘ldan borildi. V.Lenin millatga tegishli har qanday jiddiy masalani milliylik jihatdan emas, balki sinfiylik jihatdan hal qilib kerakligini uqtirib, sotsialistik tuzumga xos bo‘lgan yakka partiyaning milliy imtiyozlarga qarshi siyosatini yoqlab chiqqan edi. Ushbu g‘oyalar majmuida qurilajak “sog‘lom kommunistik jamiyat” kishilari nafaqat o‘z fikri, tuyg‘usi bilan balki kiyinish madaniyati bilan ham ajralib turishi lozim edi [7].

Xulosa qilib aytganda, milliy ziyolilar g‘oyasiga qarshi bolsheviklar mafkuraviy tahdidni kuchaytiradilar. Milliy ziyolilarining o‘lkani boshqarishga qaratilgan islohotchilik qarashlari bolsheviklar zo‘ravonlik siyosatining qurboniga aylandi. Jadid ziyolilari burjuaziyaning vakili bo‘lganlikda, ularning asarlari inqilobdan ilgari yozilganligi, unda burjuaziyaning ideallashtirilganligi hamda millatchilik ko‘rinishlari tasvirlanganligi ta‘kidlandi. Aksariyat milliy kadrlar va ziyolilar ochiqdan-ochiq aksilinqilobchilar tomoniga o‘tganligi, sovetlarga qarshi kurashib, “bosmachilikni” tashkil etishda va har qanday bo‘lsada ishchi-dehqon hukumatini yiqitish fikrida bo‘lganligini bilan bolsheviklarga katta mafkuraviy xavf solganligi keltiriladi. Jadidchilik go‘yoki “omma ongini millatchilik g‘oyalari bilan zaharlash va uni inqilobiy kurashdan chetga toritish” maqsadida tashkil etilgan reaksion burjua-millatchilik yo‘nalishi deb e‘lon qilindi.

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**MAMLAKAT IJTIMOIIY-IQTISODIY TARAQQIYOTIDA MAKROIQTISODIY
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Annotatsiya: Ushbu maqolada O'zbekiston Respublikasining so'nggi yillardagi makroiqtisodiy ko'rsatkichlari, ularning dinamikasi tahlil qilingan. Tahlil davomida yalpi ichki mahsulot (YaIM) o'sish sur'atlari, inflyatsiya darajasi, investitsiyalar hajmi, tashqi savdo balansi, bandlik va byudjet siyosati ko'rsatkichlarining o'zgarish tendensiyalari o'rganilgan. Maqolada O'zbekistonda makroiqtisodiy barqarorlikni ta'minlashda olib borilayotgan islohotlarning samaradorligi hamda istiqboldagi rivojlanish yo'nalishlari yoritilgan.

Kalit so'zlar: makroiqtisodiy ko'rsatkichlar, yalpi ichki mahsulot, inflyatsiya, investitsiya, bandlik, tashqi savdo balansi, barqarorlik.

**MACROECONOMIC INDICATORS IN THE SOCIO-ECONOMIC DEVELOPMENT OF
THE COUNTRY**

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Annotation: Analysis of macroeconomic indicators of the Republic of Uzbekistan in recent years, management dynamics. The analysis studies the trends in the growth rates of gross domestic product (GDP), the volume of investments, the organization's trade balance, employment and budget policy indicators. The article covers the comprehensive prospects of production in ensuring the macroeconomic situation.

Keywords: macroeconomic indicators, gross product, inflation, investment, employment, organization's trade balance, protectionism.

O'zbekiston mustaqillikka erishganidan so'ng bosqichma-bosqich iqtisodiy islohotlarni amalga oshirib, bozor mexanizmlari asosida faoliyat yurituvchi milliy iqtisodiyot shakllantirdi. So'nggi yillarda davlat boshqaruvi tizimi, soliq va moliya tizimlari, investitsiya siyosati tubdan isloh qilindi. Buning natijasida makroiqtisodiy barqarorlikni ta'minlash imkoniyatlari kengaydi. Makroiqtisodiy

ko'rsatkichlar mamlakat iqtisodiy holatini ifodalovchi asosiy omillar bo'lib, ular ishlab chiqarish, narxlar barqarorligi, bandlik va aholi farovonligini aniqlashda muhim ahamiyat kasb etadi.

Yalpi ichki mahsulot (YaIM) mamlakat iqtisodiyotining asosiy integrallashgan ko'rsatkichi bo'lib, ishlab chiqarilgan barcha yakuniy tovar va xizmatlar qiymatini o'zida ifodalaydi. 2020–2024-yillar davomida O'zbekistonda YaIM o'sishining barqaror tendensiyasi kuzatilmoqda. 2020-yilda pandemiya ta'sirida o'sish 1,6 foizni tashkil qilgan bo'lsa, 2021-yilda bu ko'rsatkich 7,4 foizga oshdi. 2023-yilda iqtisodiyot 6 foizga, 2024-yilda esa 6,5 foizga o'sdi. YaIM tarkibida xizmatlar sohasi ulushi 47,4 foizga yetgan, bu raqamli iqtisodiyot va xizmat ko'rsatish tarmoqlarining jadal rivojlanayotganidan dalolat beradi.

Inflyatsiya iqtisodiyotdagi narxlar darajasining o'sishini ifodalovchi muhim ko'rsatkichdir. Markaziy bankning maqsadli inflyatsiya siyosati tufayli 2020-yildagi 11,1 foizlik darajadan 2023-yilda 8,8 foizgacha pasaygan. 2024-yilda esa energiya tariflari oshishi tufayli inflyatsiya 9,8 foiz atrofida bo'ldi. Markaziy bank 2027-yilgacha inflyatsiyani 5 foiz darajasiga tushirishni maqsad qilgan.

Investitsiyalar makroiqtisodiy barqarorlikni ta'minlashda muhim rol o'ynaydi. 2024-yilda jami investitsiyalar hajmi YaIMning 37,5 foizini tashkil etdi, bu 38 milliard AQSh dollariga teng. To'g'ridan-to'g'ri xorijiy investitsiyalar ulushi oshib, energetika, transport, kimyo va qurilish sohalariga yo'naltirildi. 'Yangi O'zbekiston' investitsiya dasturi doirasida infratuzilma loyihalari amalga oshirilmoqda va 2026-yilgacha 25 mingdan ortiq yangi ish o'rinlari yaratilishi rejalashtirilgan.

2023-yilda tashqi savdo aylanmasi 62,6 milliard AQSh dollarini tashkil etdi, shundan 23,8 milliard eksport, 38,8 milliard import. Asosiy eksport mahsulotlari: oltin, tabiiy gaz, rangli metallar, to'qimachilik va qishloq xo'jaligi mahsulotlari. O'zbekistonning asosiy savdo hamkorlari — Xitoy, Rossiya, Qozog'iston, Turkiya va Janubiy Koreya. Eksportni diversifikatsiya qilish va logistika tizimini modernizatsiya qilish ustuvor yo'nalish sifatida belgilangan.

2024-yilda mehnat resurslari 20,2 million kishini tashkil etib, ularning 13,6 millioni iqtisodiy faol aholiga to'g'ri keladi. Ishsizlik darajasi 8 foiz atrofida. Davlat tomonidan kasbga o'qitish, bandlikni oshirish va kichik biznesni rivojlantirish dasturlari amalga oshirilmoqda.

So'nggi yillarda iqtisodiy o'sishning asosiy drayverlari sifatida xususiy sektor, ichki talab va eksport hajmi oshmoqda. Fiskal barqarorlikni ta'minlash, byudjet defitsitini kamaytirish, pul-kredit siyosatini qat'iylashtirish iqtisodiy barqarorlikni mustahkamlaydi. 2025–2027-yillarda iqtisodiy o'sishning o'rtacha 6 foiz darajasida saqlanishi prognoz qilinmoqda. Raqamli iqtisodiyot, innovatsiyalar va eksport salohiyatini kengaytirish iqtisodiyot barqarorligining asosiy omillari sifatida e'tirof etilmoqda.

O'zbekiston iqtisodiyoti barqaror o'sish sur'atlarini namoyon etmoqda. Yalpi ichki mahsulot (YaIM) hajmining muntazam ortib borishi, inflyatsiya darajasining izchil pasayishi, investitsiyalar hajmining ko'payishi hamda tashqi savdo aylanmasining kengayishi olib borilayotgan iqtisodiy islohotlarning samaradorligini yaqqol tasdiqlamoqda. Bu jarayon mamlakatda raqobatbardosh bozor iqtisodiyoti institutlarini shakllantirish, biznes muhitini yaxshilash va xususiy sektor faolligini oshirishga qaratilgan chora-tadbirlar bilan uzviy bog'liqdir.

Kelgusida iqtisodiy o'sishning barqarorligini ta'minlash maqsadida eksport salohiyatini oshirish, inson kapitalini rivojlantirish hamda raqamli iqtisodiyotga o'tish jarayonlarini jadallashtirish ustuvor yo'nalishlardan biri sifatida belgilangan. Ayniqsa, innovatsion texnologiyalarni joriy etish, ta'lim

sifatini oshirish va raqamli infratuzilmani kengaytirish O'zbekistonning makroiqtisodiy barqarorligini yanada mustahkamlashga xizmat qiladi.

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MODERN PEDAGOGICAL TECHNOLOGIES IN THE ABSORPTION OF NATIONAL VALUES

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Abstract: This article scientifically analyzes the significance and effectiveness of modern pedagogical technologies in instilling national values in the minds of the younger generation. In the context of globalization, where the preservation of national culture and spirituality has become a pressing issue, modern pedagogical approaches and innovative technologies serve as important tools for strengthening youth national identity, deeply understanding national values, and applying them in practice. The article thoroughly examines the role of technologies such as interactive learning, multimedia tools, virtual reality, gamification, and project-based learning in shaping national spiritual education, as well as their advantages and practical applications. The importance of teachers mastering modern technologies and applying them within the national context is also emphasized.

Keywords: National values, modern pedagogical technologies, national education, interactive learning, multimedia, virtual reality, gamification, project-based learning, pedagogical innovations, national identity.

Today, the issue of instilling national values in the education system in the younger generation is a topic that is paid great attention not only at the spiritual and educational, but also at the research level. National values are a complex phenomenon such as the historical experiences of one people, cultural heritage, customs, language and literature, moral and ethical principles, the absorption of which is considered an important factor in the stability and development of society. In this regard, the need arises for the study, systematic analysis and effective application of modern pedagogical technologies in the process of forming national spirituality in the field of pedagogy and education. In scientific sources, modern pedagogical technologies include such tools as innovative approaches in the educational process, interactive methods, information and communication technologies (ICT), multimedia tools, virtual and augmented reality, gamefication. These technologies have been shown to be effective in increasing student engagement, developing independent thinking skills, and shaping creative and critical approaches. At the same time, the study of their role in the process of instilling national values in the pedagogical process is the center of great attention in scientific research. In the process of instilling national values, pedagogical Technologies Act as a tool in awakening the emotional-intellectual activity of students, in deepening their interest in national history and culture. For example, virtual trips to virtual museums and historical sites allow readers to experience historical reality in a lively and interactive form. This serves to strengthen their national identity and respect for cultural heritage. Multimedia, on the other hand, enliven National works of art, songs, dances, literary samples and help students to assimilate through different sensory organs. In scientific research, it is noted that such methods as project-based education, solving problem situations, group work teach the application of national values in practical activities. ultimedia, on the other hand, enliven National works of art, songs, dances, literary samples and help students to assimilate through different sensory organs. In scientific research, it is noted that such methods as project-based

education, solving problem situations, group work teach the application of national values in practical activities. These techniques deepen students' attitudes towards national values while enhancing their social skills, sense of responsibility, and community. At the same time, with the help of modern ICT tools, students will be able to conduct independent research, analyze and present information.

Gamefication — the introduction of game elements into the educational process—is considered as one of the innovative approaches to the absorption of national values. This method attracts students to activities, encourages them even more, and increases interest in national topics. For example, games based on national historical events are more engaging in the study of young people and encourage them to consolidate knowledge related to national values. Also, the organization of interactive tests, quizzes and presentations on national literature, history, customs using online educational platforms and mobile applications will ease the learning process of young people and increase interest in national culture. This, in turn, serves for a broader and more effective absorption of national values. Another important aspect in scientific research in the application of pedagogical Technologies is the training of educators and their qualification for the effective application of technologies. It is important that educators study modern technologies in depth, constantly improve skills and pay special attention to national spirituality. Because educators themselves have a deep understanding of national values and must be exemplary in communicating them to students.

At the same time, when applying pedagogical technologies in the absorption of national values, it is important to take into account the adaptation to the cultural context, the historical, cultural and social characteristics of our country. Because national values are deeply attached to their local roots, these roots should not be ignored in the educational process. In conclusion, modern pedagogical technologies provide great opportunities for the absorption of national values into the younger generation. They are an important tool in improving the effectiveness of the educational process, strengthening the interest of students in national culture, forming a national consciousness and patriotic spirit.

Therefore, in the field of pedagogy, it is necessary to study these technologies on a scientific basis, to constantly improve and widely introduce them into practice. This, in turn, will ensure the stability of the national spirit and make a significant contribution to the spiritual development of our country.

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АКТИВИЗАЦИЯ ПОЗНАВАТЕЛЬНОЙ ДЕЯТЕЛЬНОСТИ УЧАЩИХСЯ ЧЕРЕЗ ИНТЕРАКТИВНЫЕ МЕТОДЫ НА УРОКАХ МАТЕМАТИКИ

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Аннотация

Статья посвящена проблеме использования интерактивных методов обучения на уроках математики в начальной школе. Рассматриваются теоретические основы, методические подходы и практические приёмы организации интерактивного обучения. Раскрывается значение игровых технологий, групповых форм работы и проблемных ситуаций в активизации познавательной деятельности учащихся. Представлены результаты педагогических наблюдений, подтверждающие эффективность интерактивных методов в повышении учебной мотивации и самостоятельности школьников.

Ключевые слова: интерактивный метод, современная технология, игра, обучение, мотивация, математика.

Введение

Современное образование требует новых подходов к организации учебного процесса, направленных на формирование активной, творческой и самостоятельной личности ученика. Математика — один из ключевых предметов, развивающих логическое и аналитическое мышление. Однако эффективность обучения во многом зависит от того, насколько активно вовлечён ученик в процесс познания.

Интерактивные методы позволяют сделать уроки математики более интересными и осмысленными. Они обеспечивают постоянное взаимодействие между учителем и учениками, создают атмосферу сотрудничества и сотворчества. В отличие от традиционных методов, интерактивное обучение предполагает активное участие каждого школьника в поиске решений, обсуждении и анализе учебных ситуаций.

Теоретические основы интерактивного обучения. Понятие «интерактивный» происходит от английского слова *interact*, что означает «взаимодействовать».

Интерактивное обучение — это форма организации познавательной деятельности, в которой учащиеся находятся в постоянном диалоге с учителем и друг с другом, участвуют в совместном решении учебных задач.

Л. С. Выготский подчеркивал, что обучение становится эффективным тогда, когда оно происходит в зоне ближайшего развития ребёнка, а это возможно лишь при активном взаимодействии. А. Н. Леонтьев и П. Я. Гальперин отмечали, что именно деятельность, основанная на сотрудничестве, обеспечивает развитие познавательных и мыслительных способностей.

В педагогике интерактивные методы рассматриваются как способ развития критического и творческого мышления (Д. Б. Эльконин, В. В. Давыдов), формирования учебной мотивации и коммуникативных навыков (И. А. Зимняя, А. В. Хуторской).

Основные интерактивные методы и их реализация:

Метод «Ступени»

Метод основан на постепенном освоении материала с использованием визуальных и игровых элементов. Лестница состоит из трёх фигур разных цветов: зелёного прямоугольника, красного треугольника и синего круга. Каждый элемент символизирует уровень понимания темы. Учащиеся, переходя «по ступеням», выполняют задания разного уровня сложности. Этот метод развивает у детей мотивацию к самостоятельной работе, умение пользоваться учебником, искать дополнительную информацию в интернете, аргументировать свои ответы.

Метод «Кто доберётся до финиша»

Данный приём представляет собой игровое соревнование, где каждый правильный ответ приближает ученика к цели — «финишу». Используется при закреплении знаний о числах, вычислениях, уравнениях. Метод активизирует внимание, формирует умение быстро мыслить, принимать решения и работать в команде.

Метод «Волшебная лента»

Суть метода заключается в последовательном выполнении заданий, написанных на карточках, соединённых в «ленту». После решения одной задачи ученик получает следующую. Этот приём помогает поддерживать интерес, учит планировать свою деятельность, развивает логическое мышление и самоконтроль.

Обсуждение результатов. Анализ полученных данных подтвердил, что использование интерактивных технологий способствует не только лучшему

усвоению учебного материала, но и развитию метапредметных умений: умению работать в паре и группе, анализировать, рассуждать и аргументировать.

Игровые элементы создают эмоциональный комфорт, способствуют снижению тревожности, повышают мотивацию и дисциплину. Таким образом, интерактивные методы выполняют не только обучающую, но и воспитательную функцию, способствуя формированию у школьников положительного отношения к учёбе.

Заключение. Интерактивные методы обучения на уроках математики обеспечивают развитие познавательной активности, творческого и критического мышления учащихся. Они делают уроки интересными, динамичными и результативными, создают условия для личностного роста каждого ребёнка.

Для эффективного внедрения интерактивных технологий необходимо систематическое методическое сопровождение учителей, обмен опытом и использование цифровых ресурсов.

Таким образом, интерактивные методы становятся неотъемлемой частью современного образовательного процесса и важным инструментом повышения качества математического образования.

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**STATISTICAL ANALYSIS OF PATIENTS WITH DIABETES 2 DISEASE (in the example
of the city of Nukus in 2025)**

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Relevance of the problem: It is clear that in recent years, in our country, in accordance with the demands of the 21st century, there have been major changes in many fields, including changes in the field of medicine. In particular, equipment related to the field of endocrinology, laboratory equipment, increase in the level of knowledge as a result of training of medical personnel, patronage service in family polyclinics, rural family polyclinics, privileges created for patients with diabetes in treatment and prevention institutions, and the growth of the people's consciousness from a cultural aspect. It is observed that the incidence of diseases is increasing.

The purpose of the work: to study and statistically analyze the type 2 diabetes mellitus of citizens living in the city of Nukus in the period of 2023.

Inspection method and materials: For our investigation, 2023 archival data of the family polyclinic on the diagnosis of type 2 diabetes among citizens living in the city of Nukus were studied retrospectively.

Inspection results: At the time of inspection, it was found that there were 100 patients in total in 2021, of which 65 were male and 35 were female patients. In a retrospective review of archival data of patients, as a result of anamnesis and laboratory findings, a high rate of type 2 diabetes mellitus, ie 65%, was male patients. In the identified patients, symptoms such as dryness of the mouth, general weakness, sleep disorders, diuresis in small amounts and frequent discharges were expressed. In the laboratory examination, it was found that the amount of sugar in the blood is on average 8.8-12.5 m/mol, and the amount of sugar in the urine is 0.5-1.5 m/mol. In 15% of male patients with diabetes mellitus, discoloration of the fingers was observed in the right big toe due to acute circulatory disorders.

Conclusion: in conclusion, it can be said that the identified patients mainly suffer from eating disorders, stressful situations in the social environment, and the patient's indifference to his health without going to the examination on time.

The reason for this was that they did not take the anti-diabetic drugs recommended by the doctors on time, and that they did not go to the medical examination every month.

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THE CONCEPT IN LINGUISTICS: ITS NATURE AND ROLE***Muhammadqulova Nigorabonu****Samarkand State Institute of Foreign Languages*[*nigoramuhammadkulova2002@gmail.com*](mailto:nigoramuhammadkulova2002@gmail.com)**Introduction**

In modern linguistics, the concept of "concept" is one of the central terms that reveal the connection between language and thinking. A person expresses his worldview, feelings and experiences in language. Therefore, language is studied not only as a means of communication, but also as a phenomenon that expresses culture, values and mentality. In linguistics, the concept of concept is at the heart of this process, because it is reflected through words, but contains a meaning that is broader than the word itself.

A concept is a generalized model of knowledge, feelings, life experience and values in the human mind. It lives in language, culture, folk oral literature, traditions, religious concepts, metaphors. The conceptual world of each people depends on their way of life, values and historical experience. Therefore, the concept is considered an important tool in studying the interaction between language and culture. In recent years, interest in the concept has increased in the fields of linguoculturology, cognitive linguistics, and semantics. Because linguists are now trying to study not only the grammatical structure or lexical meaning, but also the cultural content behind the word. Scientists such as A. Vezhbetskaya, Y. Stepanova have interpreted the concept in different ways, but they all see the concept as a central element of human thinking. Thus, the concept of "concept" in linguistics is not just a lexical unit, but also a mental unit that expresses how a person perceives the world¹.

The essence of the concept

A concept is the most important part of human thinking. It shows how a person perceives the world and how he expresses it through words. A concept combines words, images and emotions at the same time. In every language, there are words that are not only related to meaning, but also to the culture, traditions and values of that people. That is why a concept is a very important concept in linguistics. Russian linguist Y. Stepanova defines a concept as a "bridge between language and culture". According to her, a concept is a unity that is expressed in language, but acquires meaning through culture. For example, the word "hospitality" in Uzbek culture means not only an action, but also people's appreciation of a guest, showing respect to him and thereby seeking the pleasure of Allah. Therefore, a concept is a phenomenon that lives in language, but finds meaning in culture².

The relationship between concept and culture

The words in each language express the thinking and worldview of that nation. A. Vezhbetskaya calls the concept "the key word of culture". In her opinion, the most important words in a language reveal the values, attitude to life and moral views of that nation. For example, the words freedom, privacy and success in English denote values such as personal independence, free expression of one's own opinion and personal achievement in Western society. In Uzbek, or, taqdir, sabr and hospitality emphasize collectivism, honesty, patience and human relations. This difference shows that concepts

¹ Vezhbetskaya, A. (1996). Language. Culture. Cognition. Oxford: Clarendon Press.

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reflect the inner world, psyche and historical experience of each nation. The deepest layers of culture are revealed through language. In this sense, a concept is a symbol that expresses in language the general worldview formed in the minds of the people. Concepts in each language are directly related to the past, religion, values, and traditions of their people. Therefore, by studying the concept, one can deeply understand not only the language, but also the psyche of the people³.

Types of concepts

In linguistics, concepts are divided into several types. First of all, there are philosophical concepts. They include abstract concepts such as human life, death, happiness, fate, freedom. For example, the word “fate” in Uzbek thought is associated with divine will, patience, and submission to Allah, while in Western culture it is interpreted more as “coincidence” or “accident”. The next type is ethical concepts, which express moral values: concepts such as honesty, honor, dignity, conscience, and justice are among them. These words determine the correct relationship and moral standards between people in society. Cultural or national concepts are based on the unique lifestyle, values, and traditions of each people. For example, among the Uzbek people, the word “mahalla” is not only a place of residence, but also a symbol of unity, solidarity, and neighborliness. Social concepts are associated with concepts such as community life, labor, justice, and equality. All of them together help to understand the complex relationship between language and culture.

The importance of the concept in linguistics

The study of the concept in linguistics is very important, because it allows us to understand the relationship between human thinking, culture, and language. Each word represents a certain concept, so through the words in the language, one can form an idea of the worldview and values of the people. Concept analysis allows a linguist to understand cross-cultural differences, identify the causes of loss of meaning in translation, and take cultural factors into account in language learning. For example, in the Uzbek language, the word “or” has a very strong emotional meaning, combining human honor, pride, and conscience. In English, this word does not have a completely equivalent meaning, only honor or dignity are partially compatible. This situation shows that concepts are not always translated. Therefore, concept analysis plays an important role not only in linguistics, but also in the fields of cultural studies, psychology, and philosophy. In short, a concept is a phenomenon that lives in language but finds meaning in culture. It is a product of human thought and is closely related to the historical experience, religious views, and social life of the people⁴.

Conclusion

In short, a concept is the semantic core of language and culture, a cultural mirror of human thinking. It embodies the historical experience of the people, their religious beliefs, moral values, and attitude to life. The study of concepts in linguistics is not limited to semantic analysis. It is a scientific direction that helps to understand how a person perceives, feels, and values the world. Through concept analysis, we reveal the hidden cultural codes in the language, understand the mentality of a nation, and see the similarities and differences between different cultures. Therefore, the study of concepts is an urgent issue that has not only linguistic, but also philosophical, psychological, and cultural significance.

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INTEGRATING MULTIPLATFORM DIGITAL TOOLS INTO PUBLIC HEALTH POLICY

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Abstract

This paper explores the integration of multiplatform digital tools into Uzbekistan's public health policies as an innovative strategy to encourage active living and improve population health outcomes. As sedentary lifestyles and chronic diseases increase worldwide, digital health interventions have become essential tools for promoting physical activity and preventive behavior. The study examines how multiplatform technologies—including mobile fitness applications, wearable devices, web portals, and social media platforms—can enhance citizen engagement, provide real-time health monitoring, and support data-driven policymaking. By analyzing international experiences and current initiatives in Uzbekistan, the paper proposes a conceptual framework for embedding digital platforms into national health strategies. Findings highlight that government-supported digital ecosystems, when designed inclusively and with cultural adaptation, can significantly influence public motivation toward active living.

Keywords: digital health, multiplatform technology, public health policy, active living, Uzbekistan, health innovation, wearable technology, behavioral change

Introduction

In the 21st century, the intersection of technology and health has created new opportunities for governments to design effective public health interventions. The increasing prevalence of sedentary lifestyles, obesity, and chronic diseases such as diabetes and cardiovascular conditions has prompted policymakers to seek innovative solutions that extend beyond traditional health education campaigns. In Uzbekistan, where the government has prioritized digital transformation and public health improvement, integrating digital tools into policy frameworks represents a promising avenue for promoting active lifestyles among citizens.

The use of multiplatform digital tools—ranging from mobile applications and smart devices to online fitness communities—can serve as an efficient mechanism for disseminating health information, motivating physical activity, and tracking population health metrics in real time. Moreover, these platforms facilitate data collection that informs evidence-based policymaking, enabling public institutions to design personalized interventions.

Theoretical Background and Global Context

Globally, digital health platforms have become a central component of public health promotion. According to the World Health Organization (WHO, 2023), digital interventions can reduce healthcare costs and improve population health outcomes by fostering behavioral change. Countries such as Finland, Singapore, and South Korea have already incorporated digital fitness tracking and gamified health applications into national health strategies. These systems reward users for physical activity, connect them with peers, and integrate with public insurance schemes.

In the context of developing countries, however, challenges such as limited infrastructure, digital literacy, and socioeconomic inequalities can affect adoption. Uzbekistan, with its rapidly growing digital infrastructure and government-backed e-health initiatives, is in a strong position to leverage multiplatform tools for public benefit. The concept of "active living"—defined as daily engagement in physical activity as part of one's routine—can be promoted more effectively through interactive technologies that make movement measurable, social, and rewarding.

The Role of Multiplatform Digital Tools in Promoting Active Living

Multiplatform digital tools encompass a combination of mobile applications, wearable sensors, web-based portals, and social media networks that collectively shape individual and collective health behaviors. Each platform offers unique advantages:

- **Mobile Applications:** Apps such as Google Fit or MyFitnessPal encourage self-monitoring and set personalized fitness goals. Localized Uzbek-language versions could be introduced to increase accessibility.
- **Wearable Devices:** Smartwatches and fitness bands track daily activity, heart rate, and sleep quality. Integrating this data into government health databases could enhance early detection of risk factors.
- **Web Portals and Online Communities:** Websites that provide reliable health information, exercise guides, and nutrition advice can serve as virtual health education centers.
- **Social Media Platforms:** Public campaigns on Instagram, Telegram, and YouTube can create a culture of health awareness and peer motivation, particularly among youth.

By integrating these diverse tools into one cohesive strategy, public health institutions can ensure consistent messaging, sustained engagement, and improved data management.

Current Developments in Uzbekistan

Uzbekistan has made significant progress in developing its digital ecosystem, guided by national programs such as the "Digital Uzbekistan 2030" strategy. The government has also placed an emphasis on preventive medicine and population health monitoring. The Ministry of Health has launched several digital initiatives, including online consultation services, health information systems, and public awareness campaigns through social media.

However, the integration of digital tools specifically for promoting active living remains underdeveloped. Most initiatives are either isolated projects or short-term campaigns. A unified national digital platform—combining data from fitness applications, healthcare providers, and educational institutions—could substantially improve coordination and efficiency.

Furthermore, Uzbekistan's young population, high smartphone penetration rate, and active social media use create a favorable environment for implementing multiplatform digital interventions. By aligning these tools with public health policy, the government can encourage long-term behavioral change and reduce future healthcare costs.

Proposed Model for Policy Integration

To effectively integrate multiplatform digital tools into public health policy, a multi-layered model is proposed consisting of four interconnected stages:

1. **Policy and Framework Development:** Establish a national strategy for digital health promotion, supported by legislation that defines data privacy, platform interoperability, and collaboration between ministries.

2. **Infrastructure and Platform Integration:** Develop a unified digital health ecosystem where data from various platforms (wearables, apps, web portals) are synchronized and analyzed for population-level insights.
3. **Public Engagement and Education:** Launch national campaigns promoting active lifestyles through social media, gamified challenges, and school-based digital fitness programs.
4. **Evaluation and Data Analytics:** Use artificial intelligence and big data to assess program effectiveness, predict health risks, and adjust policy interventions accordingly.

This model emphasizes cross-sector collaboration among the Ministry of Health, Ministry of Education, technology companies, and universities to ensure sustainability and inclusiveness.

Challenges and Considerations

Despite the potential benefits, several challenges must be addressed:

- **Digital Divide:** Rural areas with limited internet access might struggle to participate fully in digital health programs.
- **Data Security and Privacy:** Handling personal health data requires strict regulation to maintain public trust.
- **Behavioral Resistance:** Some citizens may lack motivation or digital literacy to adopt health apps consistently.
- **Localization:** Many popular apps are in English or Russian; developing Uzbek-language interfaces is crucial for inclusivity.

Overcoming these barriers requires coordinated efforts between policymakers, health professionals, and technology developers. Incentives such as public rewards, free access to verified apps, and collaboration with schools can further enhance participation.

Discussion

Integrating digital tools into public health policy is not merely a technological innovation—it represents a paradigm shift in how health promotion is conceptualized and delivered. Instead of relying solely on hospitals and clinics, governments can now engage citizens in proactive health management through continuous digital engagement.

In Uzbekistan, such integration aligns with national priorities of youth development, digital transformation, and preventive healthcare. For instance, introducing school-based digital fitness programs can encourage students to adopt lifelong healthy habits, while workplace wellness apps can promote active living among adults. Additionally, data generated from these platforms can inform research, optimize healthcare spending, and guide urban planning for active environments such as parks and bike lanes.

Conclusion

The integration of multiplatform digital tools into Uzbekistan's public health policy represents a forward-looking approach to fostering active living. As digital technologies continue to evolve, they offer unprecedented opportunities for governments to promote healthier lifestyles, engage citizens directly, and base decisions on real-time health data.

This paper concludes that a successful implementation depends on four pillars: strong institutional collaboration, data security, public engagement, and localization of digital tools. By investing in these areas, Uzbekistan can set a regional example of how developing nations can harness technology to build healthier, more active societies.

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**EFFECT OF GULZOR BALM ON THE IMMUNE RESPONSE IN IRRADIATED
ANIMALS WITH DIFFERENT ACETYLATION TYPES****Rasulov U.M., Rasulov F.Kh.**

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Abstract

Recent advances in clinical sciences, particularly immunology, indicate that the pathogenesis of many diseases is, to varying degrees, associated with immune system dysfunction. Despite significant progress in the development of synthetic drugs, there remains a strong interest in plant-based remedies and their active components with immunotropic properties, especially for the treatment of chronic and long-term illnesses. Herbal immunomodulators serve as alternative therapeutic agents for various diseases, particularly in cases of weakened immune responses or selective immunosuppression, such as autoimmune syndromes.

Objective

To investigate immune responses in animals with different acetylation phenotypes and to evaluate their correction by the herbal preparation Gulzor Balm in irradiated animals.

Materials and Methods

In the first experimental series, the acetylation type of white outbred mice was determined according to the method of L.N. Bulavskaya. After phenotype identification, the mice were exposed to a sublethal dose of ionizing radiation (5 Gy). Five days later, they were immunized with sheep erythrocytes at a dose of 2×10^8 /mL. After another five days, the number of antibody-forming cells (AFCs) in the spleen was determined. Gulzor Balm was administered intraperitoneally once, on the day of immunization, at a dose of 0.25 mL/kg. For comparison, one group of mice received Immunomodulin at a dose of 0.01 mL/kg. Composition of Gulzor Balm: fruits and leaves of papaya, bitter melon juice, willow bark, olive leaves, birch leaves and buds, elecampane rhizomes, seeds of caraway and black cumin, milk thistle, rose hips, guava fruits and leaves, concentrated grape and pomegranate juice, and flower honey.

Results

In intact, non-irradiated slow acetylators (SA) animals, 8854.0 ± 11.0 AFCs were detected in the spleen. Irradiation with 5 Gy caused profound immune suppression, reducing the thymus-dependent response to sheep erythrocytes. In irradiated SA animals, only 1144.0 ± 16.0 AFCs were formed, a 7.7-fold decrease compared to the control. The number of karyocytes in the spleen decreased 3.0-fold, and the number of splenocytes decreased 2.6-fold. A single administration of Gulzor Balm (0.25 mL/kg) to irradiated SA animals significantly increased antibody formation in the spleen 4.5-fold. Under the influence of Gulzor Balm, the number of karyocytes increased 2.0-fold and splenocytes 2.2-fold.

In the group of irradiated mice treated with Immunomodulin (0.01 mL/kg), the immune response increased 4.9-fold, and the number of nucleated spleen cells 2.4-fold. Thus, Gulzor Balm demonstrated immunomodulatory activity comparable to Immunomodulin, a widely used clinical preparation. In intact fast acetylators (FA) animals, 12404.0 ± 12.0 AFCs were detected in the spleen. X-ray exposure (5 Gy) reduced this number 5.6-fold in the control FA group. Administration of

Gulzor Balm to irradiated FA animals significantly increased the number of antibody-forming spleen cells 4.9-fold compared to irradiated controls. Under Gulzor Balm treatment, the number of karyocytes increased 2.0-fold and splenocytes 2.4-fold. In the group treated with Immunomodulin (0.01 mL/kg), the immune response and number of splenocytes increased 4.9- and 2.5-fold, respectively.

Conclusions

1. Irradiation at a dose of 5 Gy in slow acetylators animals causes severe immune dysfunction, reducing their thymus-dependent response to sheep erythrocytes by 7.7-fold.
2. A single administration of Gulzor Balm (0.25 mL/kg) to irradiated SA animals significantly increases antibody formation in the spleen by 4.5-fold.
3. X-ray irradiation at 5 Gy reduces the number of antibody-forming cells in the spleen of fast acetylators animals 5.6-fold.
4. Administration of Gulzor Balm to irradiated FA animals significantly increases the number of antibody-forming cells in the spleen 4.9-fold compared to irradiated controls.
5. The herbal preparation Gulzor Balm effectively corrects radiation-induced secondary immunodeficiency in mice, depending on the acetylation phenotype.

IDEALS OF SPIRITUAL-MORAL IMPROVEMENT IN THE TEACHING OF GREAT SCIENTISTS AND THEIR INTERPRETATION IN MODERN PSYCHOLOGY

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Great of scholars spiritual and moral maturity ideas social development , personality integrity , behavior norms , spirituality priority and humanitarianism principles focused on . Modern psychology this ideas own interpretation , person himself to understand development , spiritual to values relied on without social adaptation provision , personal discipline and self control to do mechanisms study through supports .

Manners the issue humanity in history full-fledged accordingly Islam started , let's say exaggeration did not we will be . In Islam someone's in life every one of something own manners There is . In the world to etiquette dedicated of works basis and most Islam people representatives by written works organization will do , said in the conversation particle exaggeration no . In the past East thinkers by previously pushed views and ideas today's on the day also important educational source as youth consciousness and to the heart spiritual feed giving is coming . Far away and rich to history has was Central Asia peoples his/her own to education related rich legacy creating , improving , and empowering young people humanity , science , kindness , hard work , people and to nature friendship , generosity such as universal qualities in the spirit educated Indeed , our ancestors by abandoned priceless cultural inheritance national our spirituality core organization This is because of from it today our youth education and to education wide use to the goal It is appropriate . Because , " From our ancestors remaining inheritance of our nation not only past , as well as future for also power and dedication source is considered " Every one of the people to education related traditions there are , they are pedagogical thinker development basis become service does and child upbringing about imagination and views represents . Above As we said , every one father mother own their children perfect human to be wants , themselves enough did not receive to their hopes of children enough thinks .

Great of scholars spiritual and moral ideas :

- **Perfection and self improvement** : Abu Nasr Al-Farabi , Abu Ali Ibn Sina, etc. scientists in humans to perfection achievement , science and enlightenment through self improvement the idea previously pushed .
- **Moral standards and values** : Al- Khwarizmi , Al-Biruni such as scientists social in life moral of standards importance emphasizing , justice , honesty , integrity such as values upbringing importance showing those who have passed .
- **Humanitarianism** : Amir Temur such as commanders and scientists humanitarianism to their ideas based on the human dignity glorified , the prosperity of the nation for fought .

Modern in psychology interpretations

- **Person o ' z - o ' zi to understand development** : Modern psychology of scholars person o ' z - o ' zi to understand develop ideas own inside takes , this and person's own strong and weak sides acquaintance , goals to determine help gives .

- **Spiritual values and social adaptation** : Modern psychology spiritual of values social in adaptation and personal in good health important role play research will reach .
- **Self-esteem control to do** : Signs emphasized self control to do idea current in psychology self management mechanisms and personal discipline formation through is being studied .
- **Emotional intellect** : Modern psychology spiritual and moral maturity one part as emotional intellect to develop attention This is a human being . own feelings understand and others with in communication right road to hold that means .

Another one great scholar Burkhaniddi Marginoni is Burkhaniddi . Marginoni's moral-legal to education related in their views religion , faith , conscience , duty , humanity specific ideas person every one-sided and harmonious development main tool become service did . This in terms of than in the 21st century lived Islam of the doctrine large representative Burkhaniddi Marginoni's moral-legal to education related in their views freedom , humanity , hard work , faith , honesty , morality purity , justice , brotherhood , knowledge , independence idea characteristics main place occupies . The scholar Marginani his/her own moral and legal views with our people spirituality development , Muslim world culture to the development and social pedagogical idea development weighty contribution added .

Abu Ali son Sinoning psychological philosophical views , sciences classification , definition and composition about thoughts his " Medicine " " Laws " in the work human physiology and psychology based on interpretation Ibn Test intuition external and internal to the senses External intuition human external universe with connects , they are 5 : sight , hearing , taste knowledge , smell and skin intuition . These human known organs - skin , eyes , mouth , nose and ear with integral Depends . Internal sensations are general , for example , analysis expressive , expressive , remembering memory , imagination provider are the senses . Ibn Sina's brain all from the senses going nerves center , in general human nerve system center that about the doctrine forward pushed . Human body and from the soul organization finds , brain human managed standing The soul is the lamp , knowledge is the mother . this from the lamp spreading to the oil , to Allah wisdom – oil It looks like a lamp . from burning unstoppable that is – you you are alive If it goes off - you death You will be . Mind on the scales pull unseen every how knowledge is baseless . Therefore, logic science to learn very important . Poor knowledge owner from being according to , ignorance is better . Ibn Sina scientific psychological philosophical thoughts unique gold treasure become is considered .

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РОЛЬ ЭМОЦИОНАЛЬНОГО ИНТЕЛЛЕКТА В ПОВЫШЕНИИ ЭФФЕКТИВНОСТИ ОБРАЗОВАТЕЛЬНОГО ПРОЦЕССА

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Аннотация

В статье рассматривается понятие эмоционального интеллекта педагога и его влияние на эффективность образовательного процесса. Раскрывается структура эмоционального интеллекта, его значение в профессиональной деятельности учителя, а также пути формирования и развития этого качества. Отмечается, что высокий уровень эмоционального интеллекта способствует созданию благоприятного психологического климата в классе, повышению мотивации учащихся и успешной реализации целей обучения.

Ключевые слова: эмоциональный интеллект, педагог, обучение, мотивация, коммуникация, профессиональная компетентность.

Annotation

The article examines the concept of a teacher's emotional intelligence and its impact on the effectiveness of the educational process. It reveals the structure of emotional intelligence, its significance in the professional activity of a teacher, as well as the ways of developing and enhancing this quality. It is noted that a high level of emotional intelligence contributes to creating a favorable psychological climate in the classroom, increasing students' motivation, and ensuring the successful achievement of educational goals.

Keywords: emotional intelligence, teacher, learning, motivation, communication, professional competence.

ВВЕДЕНИЕ

Современная система образования требует от педагога не только глубоких профессиональных знаний, но и развитых личностных качеств, среди которых особое место занимает эмоциональный интеллект (ЭИ). Он обеспечивает способность понимать собственные эмоции и эмоции других людей, регулировать эмоциональные состояния и использовать их для достижения педагогических целей.

В условиях постоянных изменений, возрастающих профессиональных требований и эмоциональных нагрузок умение управлять своими чувствами и выстраивать гармоничные отношения с учащимися становится важнейшим фактором профессиональной устойчивости педагога. Эмоциональная компетентность способствует созданию гуманистической образовательной среды, повышению эффективности коммуникации и формированию позитивной мотивации к обучению у школьников.

Методы. Настоящее исследование основано на теоретическом анализе и обобщении психолого-педагогической литературы, посвящённой проблеме эмоционального интеллекта в профессиональной деятельности педагога.

В качестве методологической основы использованы:

труды П. Сэловея и Дж. Майера, разработавших концепцию эмоционального интеллекта; исследования Д. Гоулмана, раскрывающие прикладные аспекты ЭИ в профессиональной сфере;

отечественные работы А.А. Бодалёва, Н.В. Кузьминой, В.Д. Шадрикова, анализирующие психологические и деятельностные компоненты педагогического труда.

Применялись методы **сравнительного анализа, систематизации теоретических данных и интерпретации практического опыта**, что позволило определить значение ЭИ для педагогической деятельности и предложить пути его развития.

Результаты и обсуждение. Термин «эмоциональный интеллект» был впервые введён П. Сэловеем и Дж. Майером (1990) и получил дальнейшее развитие в работах Д. Гоулмана (2018).

Структура эмоционального интеллекта включает пять ключевых компонентов:

1. **Самосознание** — осознание собственных эмоций, сильных и слабых сторон;
2. **Саморегуляция** — умение управлять эмоциональными состояниями и поведением;
3. **Мотивация** — стремление к достижению целей, внутренний интерес к деятельности;
4. **Эмпатия** — способность понимать чувства и переживания других людей;
5. **Социальные навыки** — эффективное взаимодействие, сотрудничество и коммуникация.

Для педагога эти компоненты имеют принципиальное значение. Учитель с высоким уровнем ЭИ способен чувствовать эмоциональное состояние класса, поддерживать интерес учащихся к предмету, предупреждать и конструктивно разрешать конфликтные ситуации. Таким образом, эмоциональный интеллект становится важнейшим инструментом успешной педагогической практики.

Влияние эмоционального интеллекта на эффективность обучения очень важна. Так как эмоциональный интеллект напрямую связан с педагогическим мастерством. Эмоционально компетентный педагог создаёт атмосферу доверия и взаимного уважения, где учащиеся чувствуют себя уверенно и открыто выражают свои мысли. Такая среда способствует раскрытию их потенциала, развитию познавательной активности и устойчивой учебной мотивации.

Кроме того, высокий уровень ЭИ помогает педагогу справляться со стрессом и предотвращать профессиональное выгорание. Управление собственными эмоциями и понимание эмоциональных реакций учеников повышает эффективность общения и способствует реализации воспитательных задач.

Формирование эмоционального интеллекта (ЭИ) у педагогов представляет собой целенаправленный и поэтапный процесс, направленный на развитие умений осознавать, понимать и регулировать эмоциональные состояния — как собственные, так и учащихся. В современных условиях профессиональной деятельности учителя этот аспект приобретает особую значимость, поскольку именно эмоциональная компетентность обеспечивает

устойчивость к стрессу, конструктивное взаимодействие с обучающимися и успешную реализацию образовательных целей.

1. *Профессиональное образование и подготовка. Эмоциональный интеллект начинает формироваться ещё в период профессионального обучения в педагогическом вузе. Эффективным направлением является внедрение в образовательные программы специальных курсов и тренингов, направленных на развитие эмоциональной осознанности, эмпатии и саморегуляции.*

Будущие педагоги должны овладеть навыками:

распознавания и вербализации эмоций;

анализа эмоциональных состояний учащихся;

конструктивного выражения собственных чувств;

предотвращения эмоциональных конфликтов в учебной среде.

Кроме того, включение в педагогическую практику элементов **эмоционально-рефлексивного анализа** позволяет студентам осмыслить собственные реакции в процессе взаимодействия с детьми и коллегами.

2. *Непрерывное профессиональное развитие. Для работающих педагогов развитие ЭИ возможно через участие в курсах повышения квалификации, семинарах по эмоциональной компетентности, а также в рамках психолого-педагогических тренингов. Эти формы работы способствуют углублению самопознания, совершенствованию коммуникативных навыков и освоению стратегий управления эмоциями в стрессовых педагогических ситуациях. Особое значение имеет педагогическая рефлексия, то есть систематический анализ собственных профессиональных действий, эмоциональных реакций и их последствий. Она позволяет педагогу осознанно корректировать стиль взаимодействия и повышать уровень эмоциональной культуры.*

3. *Саморазвитие и личностный рост. Развитие эмоционального интеллекта невозможно без активного участия самого педагога в процессе самосовершенствования. К эффективным средствам относятся:*

ведение **дневников самоанализа**, где отражаются эмоции, трудности и способы их преодоления;

практики **осознанности и медитации**, направленные на развитие внимания к внутренним состояниям;

чтение литературы по психологии эмоций и межличностных отношений;

участие в **супервизиях** и профессиональных сообществах, где обсуждаются реальные педагогические ситуации.

Эти методы способствуют формированию эмоциональной устойчивости и способности к эмпатическому восприятию.

4. *Организационно-психологические условия. Эффективное развитие эмоционального интеллекта педагогов требует создания в образовательных учреждениях благоприятной психологической атмосферы. Руководству школы рекомендуется:*

внедрять практики **эмоционально поддерживающего лидерства**;

поощрять обмен педагогическим опытом;

развивать **корпоративную культуру взаимопонимания** и психологического комфорта.

Системная поддержка со стороны администрации и психологической службы повышает мотивацию педагогов к саморазвитию и укрепляет эмоциональное благополучие коллектива. Развитие эмоционального интеллекта возможно как в процессе профессиональной подготовки, так и в ходе непрерывного самообразования. Эффективными средствами формирования ЭИ являются:

участие в **тренингах эмоциональной компетентности** и программах развития soft skills;

использование **рефлексивных практик** (ведение дневника, анализ педагогических ситуаций);

освоение **методов стресс-менеджмента** и техник саморегуляции;

развитие **коммуникативных умений** через профессиональные сообщества и совместные проекты.

Важно, чтобы педагогические вузы включали в учебные программы курсы, направленные на формирование эмоциональной грамотности будущих учителей.

Заключение. Эмоциональный интеллект является неотъемлемой частью профессиональной компетентности педагога. Он определяет качество взаимодействия с учащимися, эффективность образовательного процесса и эмоциональное благополучие всех его участников.

Формирование и развитие эмоционального интеллекта должно рассматриваться как одно из приоритетных направлений педагогического образования. Повышение уровня ЭИ способствует созданию позитивной учебной атмосферы, укреплению мотивации учащихся и успешной реализации образовательных целей.

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**MAHMUD QOSHG'ARIYNING „DEVONU LUG'ATIT TURK" ASARINING
LINGVISTIK JIHATLARI VA ASARNING O'RGANILISHI**

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Annotatsiya. Maqolada XI asrning til olimi Mahmud Qoshg'ariyning „Devonu lug'atit turk “ asari, uning yaratilish tarixi va uning o'rganilishi haqida yozilgan. Mahmud Qoshg'ariyning tilshunoslikka oid qarashlari haqida ham ayrim ilmiy yondashuvlar tasvirlangan.

Kalit so'zlar: qiyosiy fonetika, lingvogeografiya, lug'at, lingvistika.

Til- millatning ma'naviy boyligidir. Til nafaqat muomala vositasi, balki xalqning madaniyati, urf-odati, uning turmush tarzi, tarixidir. Shu boisdan insoniyat paydo bo'libdiki til insonlar bilan yonma yon yashab, insonlar tomonidan o'rganilib unga oid ilmiy asarlar, turli xil nazariyalar bundan tashqari tilning yangidan yangi sohalari paydo bo'lib kelmoqda.

Qadim zamonlardan beri bizning yurtimiz buyuk alloma va olimlar beshigi hisoblanadi. Qaysi bir sohaga nazar tashlasak, o'sha fanda katta yangiliklar yaratishgan va qaysidir fan asoschilaridir. Shu jumladan tilshunoslik sohasida ham bir qancha asarlar yozilib, ilmiy izlanishlar olib borgan va ushbu izlanishlar natijasida bir qancha tilshunoslikning yangi sohalarni yaratishgan. Shu o'rinda Mahmud Qoshg'ariyning „Devonu lug'atit turk" asari tilshunoslik sohasida o'ziga xos ahamiyatga egadir.

Bizgacha yetib kelgan qadimgi yozma obidalaridan lingvistik jihatdan eng ahamiyatlisi Mahmud Qoshg'ariyning „Devonu lug'atit turk" asaridir. XI asrda yashab ijod qilgan tilshunos olim Mahmud Qoshg'ariyning tilshunoslikka oid „Devonu lug'atit turk" asari O'rta Osiyo xalqlarining tili tarixini o'rganish uchun eng muhim manbadir. Bu asar XI asrning 70- yillarida yozilgan bo'lsada, XX asrning boshlarida tarjima qilinib, bu asar ustida ko'plab jahon va turkiy olimlar tomonidan tarjima qilingan va ilmiy izlanishlar olib borilgan. „Devonu lug'atit turk" asarida turkiy tillar leksikasiga oid 7500 dan ziyod so'z izohlanganli va boshqa manbalarda esa 9000 so'z deb berilgan. Bu asar nafaqat o'sha davr tilidagi lug'at sifatida, balki shu bilan birga O'rta Osiyo doirasidagi, ya'ni yuqori Chindan boshlab butun Movarounnahr, Xorazm, Farg'ona, Buxoroga qadar cho'zilgan keng va katta hududlarda yashagan urug'lar, qabilalar, xalqlarni va ular tillarini va u davr tilining fonetikasi, morfologiyasi, leksikasi haqida to'liq ma'lumot beruvchi va shu davr tilidagi har xil adabiy janrlardan namunalar beruvchi nodir filologik asardir.

Mahmud Qoshg'ariy „Devon “ ni tuzishdan oldin lingvistik, tarixiy va etnografik materiallarni yig'ish bo'yicha ko'plab qabila va xalqlarni kezganligi va yillik ilmiy izlanishlar amalga oshirgani haqida olim quydagi so'zlarni aytib o'tadi: „Men turklar, turkmanlar, o'g'uzlar, chigillar, yag'molar va qig'iz shaharlarini, qishloq va yaylovlarini ko'p yillab kezib chiqdim, lug'atlarini to'pladim, turli xil so'z xususiyatlarini o'rganib, aniqlab chiqdim. ...Men tilda ularning (qoroxoniy yoxud xoqoniy turklarning) eng yetuklaridan, eng katta mutaxassislaridan, xushfahmlaridan, eski qabilaridan, jang ishlarida usta nayzador edim. Ularga shuncha diqqat qildimki, turklar, turkmanalar, o'g'uzlar, chigillar, yag'molar, va qirg'iz qabilalarining tillari butunlay dilmiga jo bo'ldi. Ularni har tomonlama puxta bir asosda tartibga soldim. Bu asar abadiy yodgorlik bo'lsin deb... bu kitobni tuzdim. Kitob

„Devonu lug‘atit turk” deb ataldi...Men bu kitobni ... hikmatli so‘zlar, sajlalar, maqollar, qo‘shiqlar, rajaz va nasr deb atalgan adabiy parchalar bilan bezadim”¹ – deydi tilshunos olim.

Mahmud Qoshg‘ariyning „Devonu lug‘atit turk “ asari tilshunoslikning juda ko‘p sohalarini qamrab olgan, xususan, bu asar ustida bir necha yil mashaqqat bilan ishlab turkiy tilshunoslikning tarixiy gramatikasi hamda qomusiy xarakterdagi yetuk bir asarni dunyoga keltirishga sabab bo‘ladi. Mahmud Qoshg‘ariy ushbu asari orqali tilshunoslikning tarixiy – qiyosiy fonetika, fonologiya, leksikologiya, leksikografiya, lingvogeografiya sohalarida diqqatga sazovor ishlarni amalga oshirgan. Bundan tashqari olim sarf va nahf ilmining asoschisi hamdir. Asarda turkiy tillar ilk bor arab tili metodologiyasi doirasida bayon qilingan . Shu bilan birgalikda Qoshg‘ariy turkiyshunoslikda ilk bor imlo talaffuzidagi tovushlarni ifodalashdan arab yozuvi asosidagi alifbo turkiy til uchun o‘z ekanini ochib berdi va o‘z davrida birinchi bo‘lib yozuvdagi kamchilikni to‘ldirish maqsadida ayrim harflarni belgilaydi. Bundan tashqari Mahmud Qoshg‘ariy turkiy til arab tilidan hech bir tomoni bilan qolishmasligi ayon bo‘lishi uchun Halil ibn Ahmadning „Kitobul ayn “ asarida tutgan tartibini qo‘llash, istemoldan chiqqan so‘zlarni ham keltirib o‘tish fikri tug‘ilganligini aytib o‘tadi.

Mahmud Qoshg‘ariy „Devoni lug‘atit turk” asrida turkiy tillarni ikkiga ajratib chiqqan. Birinchisi, barcha turkiy qavmlar uchun tushunarli bo‘lgan, rasmiy ishlarda va yozma adabiyotlarda qo‘llanuvchi, o‘tmish va ana‘nalarni saqlab qolayotgan yozma-adaboy til, buni muallif „turkcha”, „ xoqoniya til “ deb aytadi. Ikkinchisi turli turkiy shevalardan iborat.

Bu asar o‘tmishda ham, hozirda ham tadqiqotchilar tomonidan o‘zlarini qiziqtirgan masalalarga javob topib kelishgan va kelishmoqda. Masalan, bu asarni tadqiq qilgan o‘tmish olimlaridan biri Ali Amiriy quydagilarni aytib o‘tgan: „Bu kitobni qo‘lga olishim bilan o‘zimni yo‘qotib qo‘ydim, bu kitob dunyoda qiyosi yo‘q, ham ma‘lum bo‘lmagan bir turk qomusi hamda grammatikasi edi. Arab tili uchun Sibavayxiyning kitobi qanday muhim bo‘lsa, bu ham turk tili uchun shunday ahamiyatlidir. Hozirga qadar turk tilida buning kabi kitob yozilgani yo‘q. Bu kitobning haqiqiy Bahosini aniqlamoqchi bo‘lsangiz, jahonning xazinalari bunga teng kelolmas. Xususan, ushbu qomus yangi davr olimlari tomonidan qizg‘in tadqiq etilib, uning ilmiy qimmati haqida ko‘plab fikrlar bayon etilgan. Masalan, bular orasida mashhur sharqshunos olim P.K.Juzenning „Devonu lug‘atit turk” asari haqidagi quydagi fikrlar xarakterlidir: „Mahmudning bu tekshirishlari keng va chuqurki, hatto bu asar XIX asarda yozilganda ham unga shon-sharaf bo‘lardi. Mahmud Qoshg‘ariyning devoni singari asar fan olamida keying asrlarda ham yaratilgan emas. Uning asari bamisoli turkiy qomusdir”.² Haqiqatdan ham, bu asar necha yillar o‘tsa ham o‘zining bebaholigini yo‘qotmaydi.

„Devonu lug‘atit turk” asarini o‘zbek tiliga 1960-yilda S.Mutallibov tomonidan uzoq yillik mehnat samarasida tarjima qilingan bo‘lib, Olimning Mahmud Qoshg‘ariyning „Devonu lug‘atit turk” asarini o‘zbek tiliga tarjima qilinganligi o‘zbek tilshunosligida juda katta ahamiyatga egadir. „Devonu lug‘atit turk” asarining tarjimasi katta hajmlik uch tomdan iborat. Muallif ushbu asar haqida quydagi fikrlarni aytib o‘tgan: „Bizgacha devonning birgina qo‘lyozmasi yetib kelgan. Qo‘lyozma Istanbulda saqlanadi. Qo‘lyozma haqida bugingacha deyarlik to‘liq ma‘lumot berilmagan. Shuning uchun biz qo‘lyozma haqida biron fikr aytolmaymiz.....Bu asarni bostirish qanchalik muhim bo‘lsa, bu ishda

¹ Маҳмуд Қошғарий. Девону луғатит турк. – Тошкент: Фан, 1960.- I т.

² Худойбердиев Ж. Маҳмуд Қошғарий ҳаёти ва <<Девону луғатит турк>> асарининг ўрганилиши. – Тошкент: Фан, 2010.

yagona nusxaning bugun xususiyatlarini to'la berish, zarur o'rinlarini izohlash va nihoyat ehtiyotkorlik bilan ish olib boorish shuncha muhim va zarur edi. Lekin bosma nusxada bu asosiy qoida unitilgan. Biz o'z tarjimamizni Basim Atalay nusxasiga solishtirib katta foyda oldik".³ Bundan ko'rinadiki, asarning qo'lyozma ya'ni asl nusxasi haqida yetarlicha ma'lumotlar mavjud emas. Asarni o'zbek tiliga tarjima qilgan olim ham u haqida to'liq ma'lumot berolmaydi. Bu asar ustida S. Mutallibov bir qancha ilmiy izlanishlar olib borgan va bu asarni o'rganib bir qancha ilmiy kitoblar ham yozib qoldirgan.

Xulosa qilib shuni aytib o'tishimiz kerakki, Mahmud Qoshg'ariyning „Devonu lug'atit turk“ asari XI asr turkiy tillarning lingvistikasi haqida to'laqonli ma'lumot beruvchi nodir qomusiy asardir. Ushbu asarda turkiy tillarning qiyosiy fonetikasi, qiyosiy fonologiyasi, qiyosiy leksikologiyasi, so'z yasalishi va qiyosiy morfologiya haqida ham batafsil ma'lumot berilgan. Shu qatori Mahmud Qoshg'ariy lug'at tuzishning namunali mezonini yarata olgan, qiyosiy tilshunoslik, dialektologiya, lingvogeografiya, kabi tilshunoslik yo'nalishining asoschisi bo'lgan tilshunos olimdir. Uning asari ya'ni „Devonu lug'atit turk“ asari faqatgina lug'at bo'lib qolmay, balki faning boshqa sohalarini ya'ni tilshunoslikdan boshqa fanlarni rivojlanishi uchun ham katta hissa qo'shadi va bularga: tarix, geografiya, tibbiyot kabi fanlarni aytishimiz mumkin.

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STEAM YONDASHUVINING TA'LIM-TARBIYA JARAYONIGA INTEGRATSIYASI: ZAMONAVIY TENDENSIYALAR VA NATIJALAR

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Annotatsiya Mazkur maqolada STEAM (Science, Technology, Engineering, Arts, Mathematics) yondashuvining ta'lim-tarbiya jarayoniga integratsiyasi, uning o'quvchilar tafakkurini rivojlantirishdagi o'rni, tanqidiy fikrlash va muammoli vaziyatlarda mustaqil yechim topish ko'nikmalarini shakllantirishga ta'siri tahlil qilinadi. Maqolada zamonaviy tajribalar asosida ta'lim jarayoniga STEAM yondashuvini qo'shish natijalari, amaliy yondashuvlar hamda metodik takliflar keltirilgan.

Kalit so'zlar. STEAM, integratsiyalashgan ta'lim, tanqidiy fikrlash, innovatsion yondashuv, muammoli vaziyat, kreativlik, interdisciplinar metodlar.

Abstract This article analyzes the integration of the STEAM (Science, Technology, Engineering, Arts, Mathematics) approach into the educational process, its role in developing students' thinking, and its impact on the formation of critical thinking and independent problem-solving skills. The article presents the results of incorporating the STEAM approach into the educational process, practical approaches, and methodological proposals based on modern experiences.

Keywords. STEAM, integrated education, critical thinking, innovative approach, problem-solving, creativity, interdisciplinary methods.

Kirish. XXI asr ta'limi zamonaviy texnologiyalar, kreativ tafakkur va muhandislik yondashuvlariga asoslangan bo'lishi kerak. Shu nuqtayi nazardan qaraganda, STEAM ta'lim modeli o'quvchilarda nafaqat bilim, balki amaliy ko'nikmalar, tanqidiy fikrlash va ijtimoiy mas'uliyatni shakllantirishda muhim ahamiyatga ega. O'zbekiston ta'lim tizimida ham ushbu modelni qo'llash bo'yicha izlanishlar olib borilmoqda va ushbu maqolada ana shu jarayonlar yoritiladi. So'nggi yillarda ta'lim jarayonida an'anaviy yondashuvlar zamonaviy metodlar bilan boyitilmoqda. Ayniqsa, raqamli texnologiyalar, muhandislik fikrlash, kreativlik va san'atni o'zida mujassam etgan STEAM yondashuvi global miqyosda o'zini oqlagan tizimga aylandi. Bu model o'quvchilarning fanga bo'lgan qiziqishini oshirish, ularni real hayotiy muammolarni hal qilishga tayyorlash, shuningdek, fanlararo fikrlashni shakllantirish imkonini beradi. O'zbekiston Respublikasining 2022–2026 yillarga mo'ljallangan Yangi O'zbekiston taraqqiyot strategiyasida ham yosh avlodni zamonaviy kasblarga tayyorlash, innovatsion fikrlovchi shaxsni shakllantirish dolzarb vazifalardan biri sifatida belgilangan. Bu borada STEAM asosli yondashuvlar ta'lim va tarbiya tizimini yangicha bosqichga olib chiqishi mumkin. Asosiy qism. STEAM modeli o'z ichiga nafaqat an'anaviy STEM (science, technology, engineering, mathematics) fanlarini, balki san'at va dizaynni ham qo'shgan holda, kreativlik va ijodiy tafakkurni ham rivojlantirishga yo'naltirilgan. Bu yondashuv orqali o'quvchilar real hayotdagi muammolarni hal qilishga, loyihalashga, o'z fikrini ifoda etishga va natijalarni tahlil qilishga o'rganadilar.

1. STEAM yondashuvining mohiyati STEAM modeli – bu fanni (S), texnologiyani (T), muhandislikni (E), san'atni (A) va matematikani (M) yagona ta'lim tizimida integratsiyalashgan

holda o'qitishdir. Bu yondashuv o'quvchilarning nafaqat bilim olish, balki amaliy faoliyat orqali bilimlarni mustahkamlashini ta'minlaydi.

2. Ta'lim-tarbiya jarayoniga integratsiyasi STEAM loyihalari orqali o'quvchilar muammolarni aniqlash, jamoaviy ishlash, kreativ yechimlar taklif qilish va ularni amalda sinab ko'rish imkoniyatiga ega bo'ladilar. Misol: "Ekologik muammolar yechimi" mavzusida STEAM loyihasi tashkil qilinib, o'quvchilar quyosh panellari maketini yaratadilar, matematik hisob-kitoblar olib boradilar, natijada real muammoni yechish yo'llarini ishlab chiqadilar.

3. Pedagogik yondashuvlar va metodlar • Loyiha asosidagi ta'lim (Project-Based Learning) • Muammo asosida o'qitish (Problem-Based Learning) • Konstruktiv yondashuv (Constructivism) Bu metodlar STEAM ta'limining negizini tashkil qiladi va o'quvchilarni faol subyektga aylantiradi.

4. O'zbekiston ta'lim tizimida STEAM yondashuvi tajribalari 2022 yildan boshlab ayrim maktablarda "STEAM laboratoriyalari" tashkil qilindi. Ular orqali informatika, texnologiya va fan mashg'ulotlari zamonaviy usullar bilan integratsiyalashgan holda olib borilmoqda. Ushbu loyihalarda qatnashgan o'quvchilar orasida fanga bo'lgan qiziqish va ijodiy yondashuv sezilarli oshgani kuzatilgan. STEAM yondashuvi bo'yicha xalqaro va mahalliy adabiyotlarda keng tahlillar mavjud. Xususan: STEAM komponentlari bo'yicha o'quvchilarni qanday tayyorlash kerakligi yoritilgan. Yakobson, A. (2018) "STEAM Education: Theory and Practice" nomli ishda turli davlatlarda amalga oshirilgan pilot loyihalar tahlil qilingan. O'zbekiston Respublikasi Xalq ta'limi vazirligi tomonidan e'lon qilingan STEAM asoslari bo'yicha metodik qo'llanmalar ham tahlilga olingan. Mazkur adabiyotlar shuni ko'rsatadiki, STEAM modeli o'quvchilarning bilimlarni amaliyotga tadbiiq qilishga, fanlararo aloqalarni mustahkamlashga va shaxsiy rivojlanishga ijobiy ta'sir ko'rsatadi. Tadqiqotda quyidagi metodlardan foydalanildi: Taqqoslash usuli – an'anaviy va STEAM yondashuvi asosidagi ta'lim natijalari solishtirildi. Empirik kuzatuv – sinfda STEAM yondashuvi asosida o'tilgan mashg'ulotlar kuzatildi. So'rovnoma – 30 nafar o'qituvchi va 60 nafar o'quvchi orasida STEAM yondashuvi haqida fikrlar yig'ildi. Kontent-tahlil – milliy va xalqaro metodik materiallar tahlil qilindi. O'quvchilar STEAM yondashuvi asosida o'tilgan darslardan keyin tanqidiy fikrlash, jamoada ishlash va muammoni hal qilish ko'nikmalarini yaxshilaganliklarini bildirgan. O'qituvchilar STEAM loyihalarini tayyorlash va ularni amaliy darslarga kiritish orqali fanlararo bog'liqlikni samarali tashkil etish imkoniyatiga ega bo'lganliklarini qayd etgan.

Statistik tahlillar shuni ko'rsatdiki, STEAM asosidagi yondashuv natijasida o'quvchilarning fanga bo'lgan qiziqishi 40% ga oshgan.

Xulosa. STEAM yondashuvining ta'lim-tarbiya jarayoniga integratsiyasi o'quvchilarni zamonaviy kasblarga tayyorlash, ularning tafakkur doirasini kengaytirish va ijodiy faoliyatini rivojlantirishda muhim o'rin egallaydi. O'zbekiston ta'lim tizimi uchun bu yondashuv innovatsion rivojlanishning kalitidir. Kelgusida ushbu modelni yanada keng joriy etish uchun o'qituvchilarning malakasini oshirish, metodik qo'llanmalarni yangilash zarur. STEAM yondashuvi – bu zamonaviy ta'limda shunchaki metod emas, balki yangi pedagogik falsafa bo'lib, u har bir o'quvchining shaxsiy rivojlanishi, kreativ fikrlashi, real hayotda o'zini sinab ko'rishi uchun zamin yaratadi. O'zbekiston ta'lim tizimi uchun bu yondashuv yoshlarni texnologik, muhandislik va kreativlik yo'nalishlarida tayyorlashda strategik ahamiyat kasb etadi. Kelgusida: barcha umumiy o'rta maktablarda STEAM markazlarini tashkil etish; pedagoglar uchun malaka oshirish kurslarini yo'lga qo'yish; STEAM

fanlarini o'quv rejalari va darsliklarga chuqur integratsiya qilish zarur. Bunday chora-tadbirlar orqali ta'lim-tarbiya jarayonini XXI asr talablariga moslashtirish mumkin bo'ladi.

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PARENTAL ROLE EXPECTATIONS AND THE FORMATION OF RESPONSIBILITY IN FIRST-BORN AND LATER-BORN SIBLINGS

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Abstract

This study investigates the relationship between differential parental role expectations and the development of responsibility in first-born and later-born siblings. Drawing on Adler's theory of birth order and family systems theory, we hypothesize that first-born children internalize higher levels of responsibility due to parental expectations that assign them caretaking and role-modeling duties. In contrast, later-born children are expected to develop responsibility through different pathways, often involving negotiation and adaptation within the family hierarchy. A mixed-methods approach was employed, utilizing surveys to measure perceived parental expectations and self-reported responsible behaviors, alongside in-depth interviews with a subset of families. Quantitative results indicate a statistically significant positive correlation between high parental responsibility expectations and the development of responsible behaviors in first-borns. Qualitative analysis reveals that first-borns often perceive these expectations as a form of pressure that shapes their identity, while later-borns describe a more collaborative or delegated form of responsibility. The findings underscore the profound impact of birth-order-specific parental expectations on the socialization process and the divergent paths through which a sense of responsibility is cultivated within the family system.

Keywords

Parental expectations, responsibility formation, birth order, first-born siblings, Later-born siblings, sibling dynamics, family Socialization, adlerian theory, child development

Introduction

The family system is a primary context for the development of core personality traits, with parental expectations playing a pivotal role in this process. Among these traits, responsibility—a multifaceted construct encompassing accountability, dependability, and self-reliance—is critically shaped by familial interactions. A key variable influencing these dynamics is birth order, which can create distinct psychological environments for each child. First-born children often experience a parental focus on high achievement and role-modeling, while later-borns may encounter more relaxed expectations. This study investigates the nexus between these parental role expectations and the development of responsibility in first-born and later-born siblings. The research problem centers on understanding how systematic differences in parental expectations, mediated by birth order, contribute to varying pathways in the formation of responsible behavior. The primary objective is to empirically examine and compare these developmental pathways to provide a nuanced understanding of family socialization processes.

Methods

Research Design and Participants

A comparative cross-sectional design was employed. The sample consisted of 120 adolescents (60 first-borns, 60 later-borns) aged 14-17 years ($M=15.6$, $SD=1.2$) and their parents, recruited from urban secondary schools. The sample was stratified to ensure equal distribution of gender and family size (two-child families only).

Instruments

1. Parental Role Expectations Questionnaire (PREQ): A 20-item self-report scale for parents, measuring expectations on a 5-point Likert scale across two subscales: "Academic/Social Responsibility" (e.g., "I expect my child to complete homework without reminder") and "Caregiving/Chores Responsibility" (e.g., "I expect my child to help look after their sibling").
2. Adolescent Responsibility Measure (ARM): A 15-item scale assessing adolescents' self-perceived responsibility in personal, social, and domestic domains.
3. Semi-structured Interviews: Conducted with a subset of 20 parent-child dyads to gather qualitative data on the nature and communication of expectations.

2.3. Procedure

Ethical approval and informed consent were obtained. Parents completed the PREQ, while adolescents completed the ARM concurrently in a controlled setting. Interviews were audio-recorded, transcribed, and subjected to thematic analysis. Data were analyzed using SPSS v.26, employing independent samples t-tests and correlation analysis to compare groups and examine relationships between variables.

Results

3.1. Differences in Parental Expectations

Quantitative analysis revealed significant differences in parental expectations. Parents reported significantly higher expectations for Academic/Social Responsibility for first-borns ($M=4.31$, $SD=0.51$) compared to later-borns ($M=3.89$, $SD=0.62$; $t(118)=4.27$, $p<.001$). Expectations for Caregiving/Chores were also higher for first-borns ($M=4.02$, $SD=0.58$) than for later-borns ($M=3.45$, $SD=0.71$; $t(118)=4.89$, $p<.001$).

Levels of Responsibility in Adolescents

First-born adolescents scored significantly higher on the ARM ($M=42.5$, $SD=5.1$) than later-borns ($M=38.2$, $SD=6.3$; $t(118)=4.35$, $p<.001$), indicating a higher self-reported level of overall responsibility.

Correlation between Expectations and Responsibility

A strong positive correlation was found between parental expectations (PREQ total score) and adolescent responsibility (ARM score) for the entire sample ($r = .68$, $p < .01$). This correlation was stronger within the first-born group ($r = .74$, $p < .01$) than within the later-born group ($r = .61$, $p < .01$).

Qualitative Findings

Thematic analysis of interviews supported the quantitative data. Parents of first-borns frequently used terms like "role model," "pioneer," and "helper," explicitly linking these roles to the development of maturity and duty. In contrast, expectations for later-borns were often framed around "learning from their older sibling" and "being a good team member," with less emphasis on pioneering responsibility.

Discussion

The results clearly demonstrate that parental role expectations are both higher for first-born children and more strongly correlated with their development of responsibility. This supports Adler's (1928) theoretical premise of birth order creating distinct "family niches." The first-born's position as a trailblazer appears to come with a burden of higher expectations, particularly in academic and caregiving domains, which in turn fosters a stronger sense of responsibility. The lower and differently framed expectations for later-borns suggest a "dilution" of pressure, potentially leading to a more collaborative but less individually driven form of responsibility.

The stronger correlation for first-borns implies that the explicit delegation of duty is a more potent socializing mechanism for them. For later-borns, responsibility may develop through observation and indirect modeling rather than direct parental mandate. A limitation of this study is its focus on two-child families, which may not capture the dynamics in larger families. Future research should longitudinally track these relationships from early childhood and include observational measures of responsible behavior to complement self-reports.

Conclusion

This study concludes that the formation of responsibility in children is not a uniform process but is significantly mediated by birth order and the distinct parental role expectations associated with it. First-born children are socialized into responsibility through a pathway characterized by higher and more explicit demands for accountability and caregiving. Later-born children develop responsibility in a context of relatively relaxed expectations, often mediated by their relationship with an older sibling. These findings underscore the need for parental awareness regarding how their expectations are shaped by birth order and highlight the importance of consciously fostering responsibility in all children, regardless of their position in the family. Understanding these differential pathways can inform more effective family counseling and parent-education programs.

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YURAK QON TOMIR TIZIMI ANATOMIYASI

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Annotatsiya

Ushbu maqolada yurak-qon tomir tizimining anatomik tuzilishi, yurakning morfologik qismlari, qon tomirlarning tuzilishiga xos xususiyatlar hamda ularning fiziologik ahamiyati yoritilgan. Shuningdek, arteriyalar, venalar va kapillyarlarning histologik qatlamlari o'rganilib, qon aylanish tizimining organizmdagi asosiy vazifalari tahlil qilingan. Yurakning o'ng va chap bo'limlari, klapanlar tizimi, hamda kichik va katta qon aylanish doiralari haqidagi anatomik ma'lumotlar asosida tizimning funksional yaxlitligi ilmiy asoslangan.

Kalit so'zlar: Yurak, qon tomirlar, anatomiya, arteriya, vena, kapillyar, qon aylanish doirasi, klapan, miokard, qon aylanish tizimi.

Kirish

Yurak og'irligi 250-350 gramm bo'lgan mushak organi bo'lib, mediastinda qiya joylashgan. U sternum va qovurg'a xaftagalarining orqasida yotadi, uning massasining taxminan uchdan ikki qismi o'rta chiziqning chap tomonida, cho'qqisi diafragmaning yuqori yuzasida joylashgan.

Yurak tanani qon bilan ta'minlaydigan nasos vazifasini bajaradi va uni gaz almashinuvi uchun o'pka zanjiriga o'tkazish evaziga qabul qiladi, bu jarayon to'qimalarga kislorod va ozuqa moddalarini etkazib berishni ta'minlaydi, shu bilan birga karbonat angidrid va boshqa metabolik chiqindilarni olib tashlashni osonlashtiradi.

Tashqaridan ichkariga qarab harakatlanuvchi yurak uchta asosiy qatlamdan iborat: epikard (tashqi qavat), miyokard (o'rta mushak qavati) va endokard (eng ichki

qavat). Miyokard yurak to'qimalarining asosiy qismini tashkil qiladi va qonni pompalash uchun mas'ul bo'lgan yurak mushak hujayralarini o'z ichiga oladi. Perikard yurak va uning katta tomirlarining juxtakardiyak qismlarini o'rab turgan himoya qatlami. U ichki visseral va tashqi parietal qatlamlardan iborat bo'lib, ular orasida yurakning silliq harakatini ta'minlaydigan moylash suyuqligi mavjud.

Asosiy qism

Yurakda to'rt kamera mavjud bo'lib, ular asosan ikkita kamerali (atrium va qorincha) zanjirning ikki tomonini tashkil qiladi; chap yon kameralar tizimli qon aylanishini, o'ng tomondagi kameralar esa o'pka qon aylanishini ta'minlaydi. O'ng tomonli kameralar yurakning old yuzasining asosiy qismini tashkil qiladi. Yurak cho'qqisini o'z ichiga olgan chap chegaraning chap qirrali chizig'idan tashqari, yurakning o'ng tomoni chap yurakning old tomonining katta qismini qoplaydi.

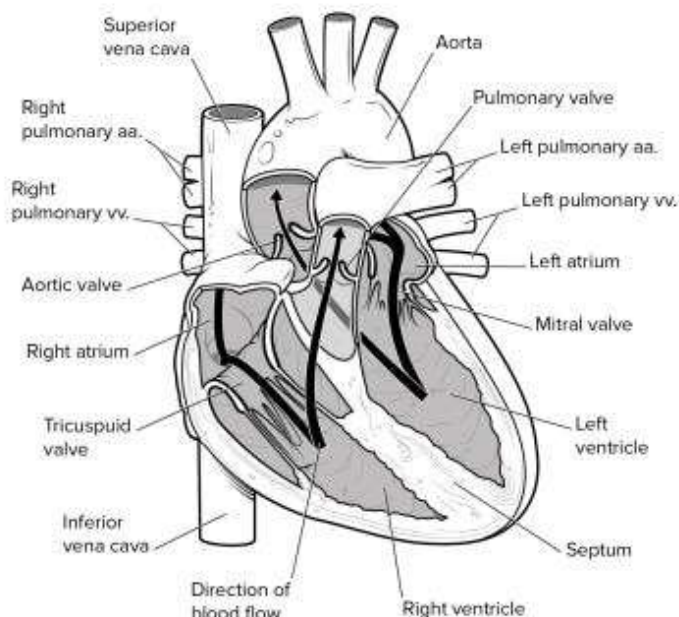
Har bir tomonning kameralari atrioventrikulyar (AV) qopqoq bilan ajratilgan. Chap qirrali kameralar mitral (bikuspid) qopqog'i bilan, o'ng tomonli kameralar esa trikuspid qopqog'i bilan bo'linadi. Qon yurak orqali faqat bitta yo'nalishda oqadi, bu bosim gradienti asosida klapanlarning ochilishi va yopilishini tartibga soluvchi valf tizimi tomonidan amalga oshiriladi (quyidagi rasmga qarang).

Har bir yurak urishi sistola (qisqarish) va diastola (bo'shashish) o'rtasida almashinadigan muvofiqlashtirilgan yurak tsiklini o'z ichiga oladi, bu qonni samarali chiqarish va to'ldirish imkonini beradi. Maxsus mushak tolalari, Purkinje tolalari yurakning o'tkazuvchanlik tizimining bir qismi bo'lib, qisqarish vaqtini muvofiqlashtirishga yordam beradi.

Yurak mushaklari o'ziga xos qon ta'minotini aorta tubidan chiqadigan o'ng va chap koronar arteriyalar orqali oladi. Yurak tomirlari kislorodsiz qonni koronar sinus orqali o'ng atriumga qaytaradi.

Yurakning ritmik qisqarishi quyidagilar tomonidan boshqariladi:

- O'ng atriumning yuqori qismida joylashgan sinoatrial (SA) tugun, yurakning tabiiy yurak stimulyatori vazifasini bajaradi.
- Atrioventrikulyar (AV) tugun, atriya va qorincha qisqarishlari o'rtasidagi vaqtni muvofiqlashtiradi.
- Purkinje tolalari qorincha devorlari bo'ylab elektr impulslarini tarqatadi.



Yurak

mushaklarining o'ziga xos xususiyatlari

Yurak mushak hujayralari (kardiomiotsitlar) shoxlangan, chiziqli va bir yadrosiz (bitta yadroli) hujayralar bo'lib, ularda miofibrillar mavjud. Strukturaviy tarzda, yurak mushaklari qisqarishning asosiy birliklari bo'lgan va mushakka chiziqli ko'rinish beradigan sarkomerlarga tashkil topgan.

Yurak mushaklari aerob nafas olishga bog'liq bo'lgan ko'p mitoxondriyalarga ega bo'lib, ular asosan hujayra funktsiyasini energiya bilan ta'minlaydigan adenozin trifosfat molekulasi hosil qiladi (quyidagi rasmlarga qarang). Bundan tashqari, yurak mushagi "avtoritmiklik" deb nomlanuvchi noyob qobiliyatni namoyon qiladi, bu erda maxsus yurak stimulyatori xujayralari muntazam ravishda avtonom impulslar paydo bo'lmaydi. signallar va gormonal ta'sirlar yurak tezligi va qon bosimini tartibga solish uchun bu ichki ritmni modulyatsiya qiladi.

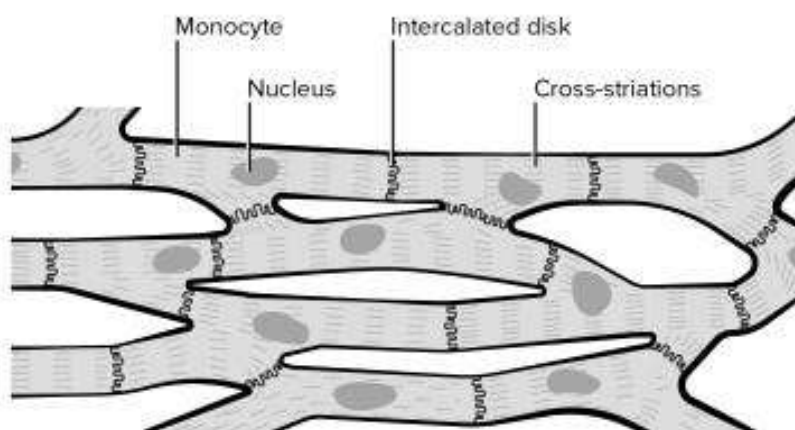
Qo'shni yurak hujayralari desmosomalar, bo'shliqlar va yopishgan birikmalarni o'z ichiga olgan interkalatsiyalangan disklar bilan bog'langan.

- Bo'shliqlar miyokard bo'ylab sinxronlashtirilgan qisqarishni ta'minlab, tez elektr signalini uzatish yoki tez ion uzatish imkonini beradi.
- Desmosomalar mexanik kuchni ta'minlaydi, bu yurakning kuchli qisqarishi paytida zarurdir.
- Adherens birikmalari strukturaviy yaxlitlikni saqlaydi.

Miokard o'zini funktsional sintsitium sifatida tutadi, chunki bo'shliqlar bilan ta'minlangan elektr bog'lanish harakati.

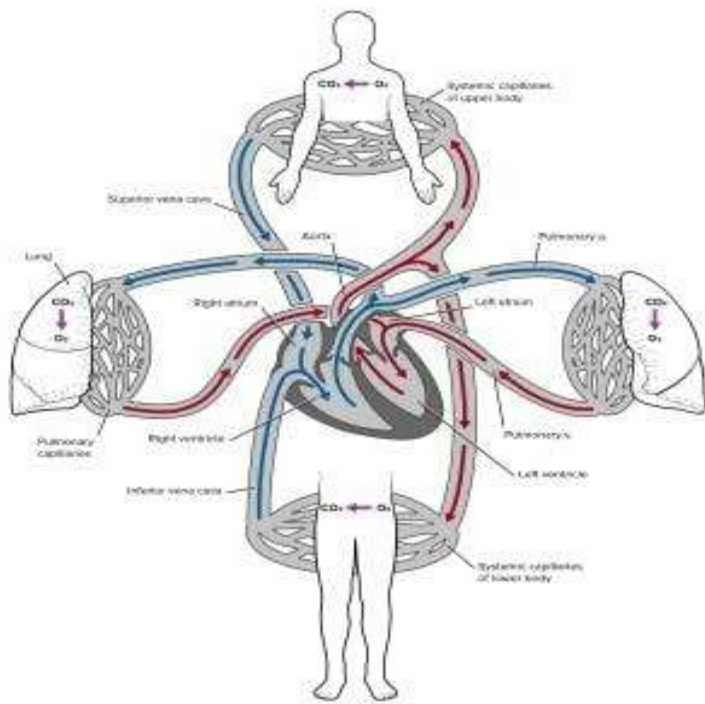
Qo'zg'alish-qisqarish birikmasi paytida, kuchlanish bilan bog'langan kanallar orqali kaltsiy oqimi sarkoplazmatik retikulumdan kaltsiyning qo'shimcha ajralishini qo'zg'atadi, bu jarayon kaltsiy-induktsiyali kaltsiyning chiqishi (CICR) deb ataladi. Kaltsiy kontsentratsiyasining bu ko'tarilishi aktin va miyozin filamentlarining o'zaro ta'sirini ta'minlash orqali qisqarishni osonlashtiradi. Har bir qisqarishdan so'ng, kaltsiy ionlari yurakning tsiklik nasos harakatini ta'minlab, bo'shashishni ta'minlash uchun qayta so'riladi.

Ushbu ulanishlar butun miyokardning muvofiqlashtirilgan birlik sifatida ishlashiga imkon beradi, bu esa sinxronlashtirilgan qisqarishlarni ta'minlaydi.



Tizimli qon aylanishi

Tizimli aylanish yurakning chap tomonida paydo bo'ladi va kislorod bilan to'ldirilgan qonni o'pkadan chap atriumga qabul qilish orqali ishlaydi va mitral qopqoq orqali chap qorinchaga bir tomonga quyiladi. Mitral qopqoq bir tomonlama oqimni ta'minlaydi va qorincha qisqarishi paytida teskari oqimni oldini oladi. Chap qorinchadan kislorodga boy qon aorta semilunar qopqog'i orqali inson tanasining barcha a'zolariga pompalanadi (quyidagi rasmga qarang). Tanadagi eng katta arteriya bo'lgan aorta kichikroq arteriyalarga, arteriolalarga va oxir-oqibat kapillyarlarga shoxlanadi, bu hujayra darajasida oziq moddalar va gaz almashinuvini osonlashtiradi. Deoksidlangan qon tomirlar orqali yurakka qaytadi va oxir-oqibat o'ng atriumga etib boradi va tizimli qon aylanishini yakunlaydi.



Tomirlar anatomiyasi

Arteriya qonni yurakdan periferik organlarga olib boradigan qon tomiridir (quyidagi rasmga qarang). Arterial tizim uchta alohida qatlamdan iborat:

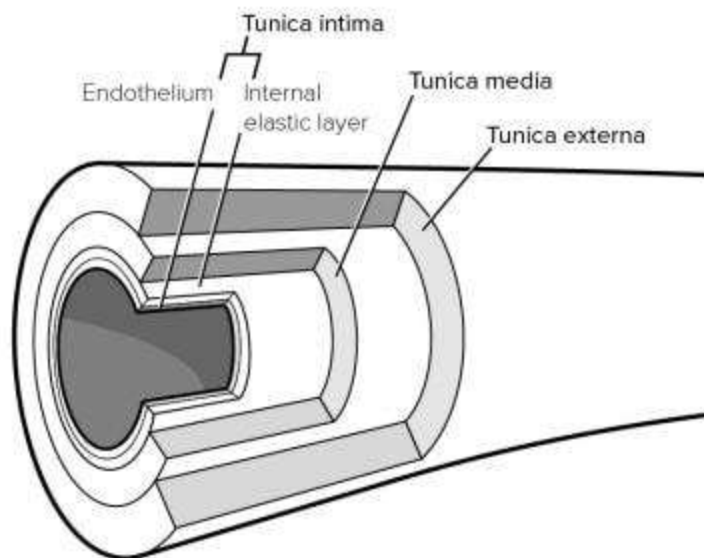
- **Tunica intima** - endotelial hujayralar bilan eng ichki qatlam
- **Tunica media** - silliq mushak va elastinli o'rta qatlam
- **Tunica adventitia** - strukturaviy yordamni ta'minlaydigan tashqi qatlam

Ular quyidagilarga bo'linadi:

O'tkazuvchi arteriyalar - Elastik arteriyalar deb ham ataladi, bularga aorta va uning asosiy shoxlari kabi yirik tomirlar kiradi. Ularning devorlari elastik tolalarga boy bo'lib, ular yurakdan chiqarilgan qonning yuqori bosimiga bardosh berishga va diastol paytida doimiy qon oqimini saqlab turishga imkon beradi.

Tarqatish arteriyalari - Bu qonni tananing ma'lum hududlariga tarqatadigan o'rta kattalikdagi mushak arteriyalari. Ularning devorlarida silliq mushaklarning ko'proq qismi mavjud bo'lib, bu vazokonstriksiya va vazodilatatsiya orqali qon oqimi va bosimini aniq nazorat qilish imkonini beradi.

Arteriolalar - eng kichik arteriyalar, arteriolalar, kapillyar to'shaklarga qon oqimini tartibga soladi. Ular tizimli qon tomir qarshiligini va qon bosimini nazorat qilishda muhim ahamiyatga ega. Arteriolalarning diametri avtonom nerv tizimi va mahalliy kimyoviy signallar bilan dinamik ravishda o'rnatiladi.



Xulosa

Yurak-qon tomir tizimi inson organizmidagi eng muhim hayotiy tizimlardan biridir. U barcha to‘qimalar va a‘zolarga kislorod hamda oziq moddalarni yetkazib beradi, metabolik mahsulotlarni chiqarilishiga yordam beradi. Yurakning morfologik tuzilishi va qon tomirlarning qatlamli tashkil etilishi organizmning fiziologik ehtiyojlariga mos ravishda yuqori darajada moslashgan. Shu bois yurak-qon tomir tizimining anatomiyasini chuqur o‘rganish tibbiyot sohasida yurak kasalliklarini erta tashxislash va samarali davolashda muhim ahamiyat kasb etadi.

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TUG'MA YURAK NUQSONLARI: ULARNING ANATOMIK ASOSLARI VA TURLARI

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Annotatsiya: Ushbu maqolada tug'ma yurak nuqsonlarining anatomik asoslari, embriologik rivojlanish bosqichlari hamda ular asosida shakllanadigan anomaliyalar yoritilgan. Nuqsonlar sianotik va asianotik guruhlariga bo'linib, har birining klinik ko'rinishi, diagnostika usullari (EKG, EKO, MRT, angiografiya) va davolash yondashuvlari tahlil qilinadi. Eng ko'p uchraydigan tug'ma yurak nuqsonlari – VSD, ASD, PDA, Tetralogiya Fallot va katta tomirlar transpozitsiyasi kabi holatlar anatomik va fiziologik jihatdan chuqur tahlil qilinib, zamonaviy tibbiy yondashuvlar asosida baholanadi. Shuningdek, maqolada epidemiologik ma'lumotlar, xavf omillari va profilaktika choralariga ham alohida e'tibor qaratilgan.

Kalit so'zlar: tug'ma yurak nuqsonlari, VSD, ASD, PDA, Tetralogiya Fallot, embriologiya, sianotik nuqson, asianotik nuqson, yurak anatomiyasi, diagnostika, profilaktika, EKO, MRT.

Yurakning embrional rivojlanishi va anatomik asoslari

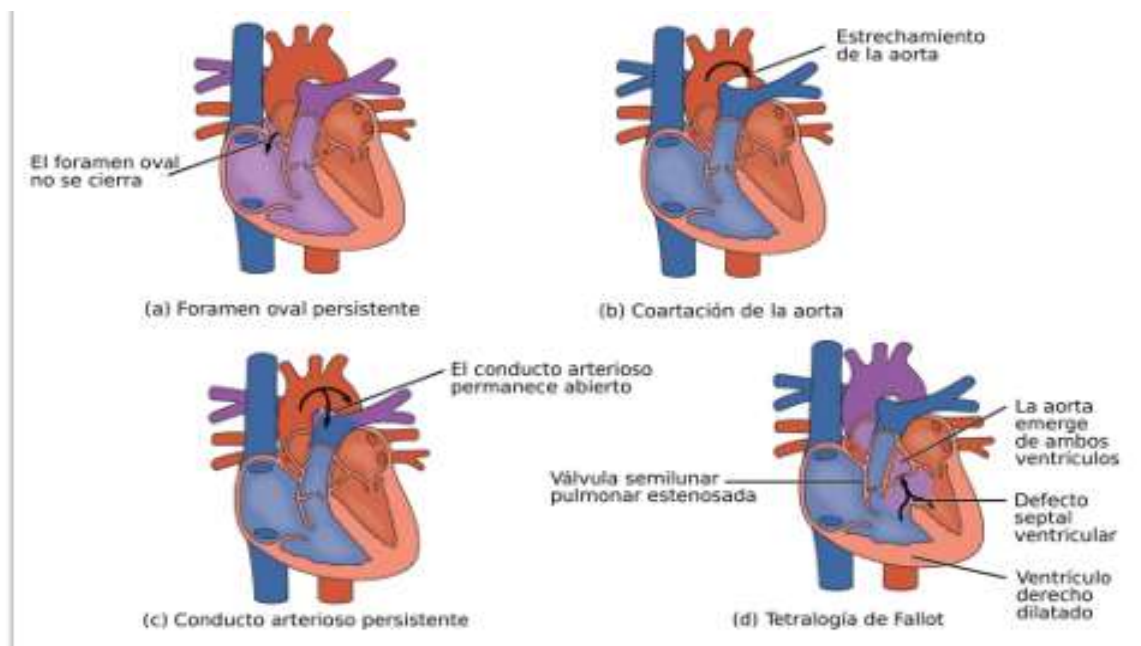
Yurak embrionik rivojlanishi homilaning 3-4 haftalaridan boshlab boshlanadi. Ilk bosqichda yurak tubi paydo bo'lib, u asta-sekin aylanish va suvchi rebralar hosil bo'lishi bilan to'rt bo'linmaga ajraladi: 2 atrium va 2 ventrikul. Atriyalar va ventrikullar o'rtasidagi septalar hamda aorta bilan o'pka arteriyasining chiqish yo'llari muqarrar ravishda bo'linishi lozim. Atrial septasiya (septum primum va sekundum) va ventrikulyar septasiya (muskulyar va membranoz qismlar) aniq paydo bo'lishi kerak. Masalan, o'ng va chap atriyalarni ajratuvchi septum primum va sekundum o'sib, oralaridagi foramen ovale orqali organizmda oksigenatsiyalashgan qon almashinuvi

ta'minlanadi (tug'ilishdan keyin normalda yopilishi kutiladi) . Ventrikulyar septumning mushak qismi qovurg'a qismidan yuqoriga tomon rivojlanib, kichik bo'shliqqa (interventrikulyar foramen) ega bo'ladi, so'ngra endokard yostiqliklardan kelib chiqqan membranali qism bilan to'ladi . Aortika dastasi va o'pka arteriyasini ajratuvchi spiralali septum ham bu bosqichda hosil bo'lib, aorta va o'pka arteriyasini to'g'ri joylarga yo'naltiradi . Ushbu jarayonlardagi har qanday nuqson yurak tuzilishida anomaliyalarga olib kelishi mumkin.

Embriogenizmdagi yurak bo'linishi tug'ma nuqsonlarning asosiy sababidir. Masalan, septum primum va sekundum to'liq hosil bo'lmasa, atriyal septal defekt (ASD) paydo bo'ladi; ventrikulyar septum to'liq tugamasa, interventrikulyar septum defekti (VSD) yuzaga keladi. Shuningdek, spiralali septum noto'g'ri hosil bo'lsa, aorta va o'pka arteriyasi transpozitsiyasi yoki Truncus arteriosus kabi jarayonlar aniqlanadi. Homila ichidagi qon aylanishida foramen ovale va ductus arteriosus kabi vaqtinchalik o'tish tarmoqlari bo'lib, ular tug'ilishdan keyin yopilishi shart. Ular ochiq qolishi ham ba'zi nuqsonlarga sabab bo'lishi mumkin. Yuqoridagi anatomik asoslar tushunilishi tug'ma yurak nuqsonlarining xilma-xilligini va klinik namoyonini o'rganishda juda muhimdir.

Tug'ma yurak nuqsonlarining umumiy klassifikatsiyasi

Tug'ma yurak nuqsonlari ikki katta guruhga bo'linadi: sianotik (ko'kargan) va asianotik (no-ko'kargan) nuqsonlar . Sianotik nuqsonlar kislorodga boy qon bilan kislorodga kam qon aralashishiga olib keladi. Natijada to'qimalarga yetayotgan kislorod miqdori kamayib, teri, tirnoq atrofida ko'kargan rang (tsianoz) paydo bo'ladi . Misol uchun, Tetralogiya Fallot, katta tomirlar transpozitsiyasi, pulmonal 6 1 9 atrezia, total anomal o'pka venalari kirib kelishi kabi yurak anomaliyalari sianotik guruhga kiradi . Asianotik nuqsonlar esa odatda organizmga yetadigan kislorod miqdoriga jiddiy ta'sir qilmaydi . Bunday nuqsonlarda bemor ko'pincha ko'karishsiz bo'lishi mumkin; ko'karganlik faqat holatingi og'ir bo'lganda yuz beradi. Asianotik nuqsonlarga interventrikulyar septum defekti (VSD), atriyal septum defekti (ASD), arterial dukt yopilishi (PDA), pulmonal yoki aortal klapan stenozlari va aorta koarktatsiyasi kiradi . Ushbu umumiy klassifikatsiya yurak nuqsonlarining kislorod ta'minotiga ta'siriga qarab guruhlanishini ko'rsatadi.



halqa), (b) aorta koarktatsiyasi, (c) arteriozli dukt yopiq bo‘lib qolishi (PDA), (d) Tetralogiya Fallot. Har bir yurak nuqsoni anatomik tuzilishga ta’sir qiladi; masalan, Tetralogiya Fallotda to‘rt asosiy nuqson mavjud: interventrikulyar septumning nuqsoni, o‘pka chiqish yo‘lidagi torayish, o‘ng bo‘yрак mushaklarining gipotrofiyasi va aortaning “ustiga chiqishi”. Ushbu diagramma tug‘ma nuqsonlarning strukturaviy o‘zgarishlarini ko‘rsatib Tug‘ma yurak nuqsonlarining ayrim turlari: (a) oval foramen yopilmay qolishi (uch sayyorada qo‘shimcha, ularning klinik oqibatlarini tushunishda yordam beradi.

Tug‘ma yurak nuqsonlarining asosiy turlari

Interventrikulyar septum defekti (VSD)

Ventrikulalar septumi bo‘ylab teshik mavjud bo‘lgan VSD tug‘ilgan paytdan boshlab mavjud bo‘ladi . Bu eng keng tarqalgan tug‘ma yurak nuqsoni bo‘lib, taxminan har 1000 ta chaqaloqdan 2–5 tasida uchraydi . VSD hisobiga chap yurakdan o‘ng yurakka oqayotgan qon miqdori ortadi; kattaroq defektlarda bu shunt keng bo‘lib, o‘pka aylanmasi haddan tashqari ko‘payishi, o‘pka arterial bosimining oshishi va yurak yetishmovchiligining rivojlanishiga olib keladi . Kichik VSDlar ko‘pincha alomat bermaydi va tug‘ilishdan keyin mustaqil yopilishi mumkin . Klinika jihatidan katta VSDlarda bemorda yurakning chap bo‘lmali og‘ir ishlashi, congestive yurak yetishmovchiligi belgilari, tez-tez nafas olish va yaxshi bo‘lmay qolish ko‘rinadi. Auskultatsiyada parasternal mintaqada doimiy sistro‘ladi-murali shovqin eshitiladi.

Diagnostika asbob-uskunalar yordamida defekt joyi va kattaligi aniqlanib, ehtiyoj bo'lsa, yorilgan septum sifatida plastik yoki kateter orqali yopinishi tavsiya etiladi.

Atriyal septum defekti (ASD)

Atriyalar oralg'ida ochiq devor hosil bo'lgan holat ASD deb ataladi . Bu ham keng tarqalgan CHD turi bo'lib, asosan septumning o'rta qismida joylashgan sekundum tipida uchraydi (ASDlarining taxminan 80 foizi) . Atrial septumda ochiq joy bemorda chap atriyadan o'ng atriya qonning o'tishiga imkon beradi . Natijada o'ng yurak bo'lmali hajmi va bosimi ortadi, o'pka aylanishi oshadi. Katta ASDlar uzoq muddat qoldirilsa o'ng bo'yni qalinlashishi (gipertrofiya), o'pka arterial bosimining ko'tarilishi kuzatiladi. Bemorlar bolalikda ko'pincha simptomlarsiz bo'lishi mumkin, ammo kattaroq defektlarda kelajakda tez charchash, yurak ritmi buzilishi va yurak yetishmovchiligi belgilariga olib keladi. Kichik ASDlar esa kattalarga qaraganda kamroq simptom beradi. Diagnostikada EKO orqali defekt aniqlanadi; katta ASDlar kateter orqali plastik yopinishi yoki operativ tuzatish talab qilinadi .

Arteriozli dukt yopiq bo'lib qolishi (PDA)

Fetal davrda aorta bilan o'pka arteriyasini bog'laydigan ductus arteriosus tug'ilishdan keyin ochiq qolsa, PDA rivojlanadi . Normalda tug'ilgach bu aralaqo'm yopilishi kerak, ammo PDAda qon aortadan o'pka arteriyasiga doimiy yo'l topadi. Natijada yurakda chapdan o'nga yo'nalishdagi shunt paydo bo'lib, o'pka aylanishi haddan tashqari ortadi . Kichik PDAlarda faqat stetoskopda „ziriq-ziriq“ ovoz (murakkab tok shovqin) eshitiladi, katta PDAlar esa chaqaloqda yurak yetishmovchiligi belgilariga (tez tebranish, og'ir nafas olish) olib keladi. Davolashda tug'ruqdan keyin erta bosqichda prostaglandinlar yordamida ductus vaqtincha ochiq ushlanib, keyinchalik kateter orqali kichik implant yoki jarrohlik yopinishi tanlanadi.

Pulmonar klapan stenozisi

Pulmonal stenozida o'ng yurakdan o'pka arteriyasiga chiqish oldidagi klapan torayadi, natijada o'ng ventrikul katta bosim bilan qon oqizishi kerak bo'ladi . Bu holatda o'ng yurak qismi gipertrofiyalanadi. Stenoz darajasi yengildan og'irgacha o'zgaradi: yengil stenozlarda simptom bo'lmasligi yoki faqat stetoskopda shovqin paydo bo'lishi mumkin, og'ir stenoz esa nafas qisishi, ko'karganlik va yurak yetishmovchiligi belgilari bilan namoyon bo'ladi . Davolashning asosiy usuli — kateter bilan valvuloplastika yoki jarrohlik klapan plastikasi bo'lib, bu oqimni kengaytirishga imkon beradi.

Aorta koarktatsiyasi

Aorta koarktatsiyasida aortaning ma'lum bir qismi torayadi, odatda son arterial chiqishi yaqinida. Natijada chap yurak kattaroq kuch bilan qon quvurtirishi kerak bo'ladi. Klinik jihatdan bu qon bosimining yuqori va pastki a'zolarida farqiga olib keladi: yuqori qismda gipertenziya, oyoqlarda esa qon oqimi cheklanishi tufayli past puls va sovuq oyoqlar kuzatiladi. Kuchli koarktatsiyali chaqaloqlarda erta yoshda yurak yetishmovchiligi simptomlari (nafas qisilishi, ovqat yeyishda qiyinchilik) paydo bo'ladi. Operativ usulda koarktatsiyali segmentni kesib o'tib, bog'lash yoki protkanozni stent bilan kengaytirish tavsiya qilinadi.

Tetralogiya Fallot

Tetralogiya Fallot – eng keng tarqalgan sianotik tug'ma yurak nuqsonlaridan biri. U to'rt asosiy anatomik o'zgarishni o'z ichiga oladi: interventrikulyar septumning keng defekti (VSD), o'ng bo'yni chiqish yo'lidagi stenoz yoki atrezia, o'ng ventrikul mushaklarining qalirlashishi va aortaning ikki yurakdan ham chiqishiga moyilligi (to'g'ri joylashmagan holda ustiga chiqishi). Natijada yurakka kirayotgan qisman oksigenatsiyalangan qon kislorod kam bo'lgan qon bilan aralashib ketadi, bu esa bemorda bolalikdan ko'karish (tsianoz) va "tet-spel" episodlariga olib keladi. Birinchi yilda bemorlarda ayniqsa yig'loq, siydik chiqarish va holat o'zgarishi bilan kuchayuvchi sianoz epizodlari kuzatilishi mumkin. Tetralogiya 10 23 3 24 Fallot CHDning 7–10 foizini tashkil etib, sianotik defektlar orasida eng tez-tez uchraydi. Davolash jarrohlik bo'lib, odatda chaqaloqning ilk 6 oyida yurakni butunlay rekonstruksiya qilish amalga oshiriladi; shuningdek, vaqtincha palliyativ shunt usullari ham qo'llanilishi mumkin.

Katta tomirlar transpozitsiyasi (TGA)

Dextro-transpozitsiyada aorta o'ng ventrikuldan, pulmonar arteriya esa chap ventrikuldan chiqadi. Buning natijasida organizm va o'pka aylanishlari bir-biridan butunlay ajralib ketadi: o'ng yurakka kelayotgan deoksigenlangan qon butunlay organizmga, chap yurakka kelayotgan oksigenlangan qon esa faqat o'pka aylanishiga yuboriladi. Tug'ilgach bemorda darhol chuqur sianoz (ko'karganlik) yuzaga keladi, chunki organizmga yetadigan qon kisloroddan mahrum bo'ladi. Hayot uchun zarur bo'lgan ozuqa nafas olish yo'li orqali faqat foramen ovale yoki PDA kabi o'tish joylari ochiq bo'lsa amalga oshadi. Shuning uchun ushbu nuqsonni tug'ilishdan keyin darhol aniqlab, prostaglandin yordamida ductus arteriosusni saqlab qolish va keyinchalik aorta va pulmonar arteriyani qayta joylashtirish (arterial switch operatsiyasi) zarur.

Diagnostika usullari

Tugʻma yurak nuqsonlarini aniqlashda bir nechta tekshiruvlar qoʻllaniladi. Elektrokardiogramma (EKG) yurakning elektr faolligini oʻlchab, yurak boʻlinmalarining oʻlchami va impuls oʻtkazuvchanligini baholaydi. Masalan, baʼzi nuqsonlarda oʻng yoki chap boʻyni kengayishi va gipertrofiya EKGda aks etadi. Rentgenografiya orqali yurakning kattaligi, shakli va oʻpka tomirlari namoyishi tekshiriladi. Kattalashgan yurak soyasi yoki oʻpka qon aylanishining ortishi nuqson darajasini koʻrsatishi mumkin. Eng asosiy tekshiruv — ehokardioqrafiya (EKO) boʻlib, u ultratovush yordamida yurak anatomiyasini va funksiyasini batafsil koʻradi. Transstorakal yoki transesophageal EKO yordamida septal defektlar, klapan anomalilari va aralash anomaliyalar aniqlanadi. Murakkab holatlarda kardiyak MRI yoki KT qoʻllanilib, 3D tarzda yurak va tomirlar tuzilishi koʻriladi. Kateterizatsiya va angiografiya invaziv tekshiruv sifatida qondagi bosim oʻlchovi va kontrast bilan yurak kameralari hamda tomirlarni tasvirlashga imkon beradi. Xulosada, toʻliq diagnostika yurak tuzilishi va oqimi haqidagi maʼlumotlarni birlashtirgan holda, davolash strategiyasini belgilashga yordam beradi.

Davolash yondashuvlari

Tugʻma yurak nuqsonlarining davolash usuli anomaliyaning turiga va ogʻirligiga bogʻliq. Konservativ davolash sifatida yurak yetishmovchiligi va aritmiyalarning belgilari dori vositalari bilan boshqariladi. Masalan, ACE ingibitorlari, beta-blokerlar va diuretiklar yurakning ishini yengillashtiradi, ortiqcha suyuqlikni chiqarib, yurak yukini kamaytiradi. Arteriozli duktni yopish uchun tugʻruqdan oldin yoki keyingi fazada indometatsin singari dori beriladi. Intervension kateter usullari orqali ham koʻplab tuzatishlar mumkin. Kichik yoki oʻrta oʻlchamdagi ASD va VSDlar kateter yordamida maxsus implant bilan yopinishi (ochiq yurak operatsiyasiz) mumkin. Bundan tashqari, klapan stenozlarini balonli 34 4 valvuloplastika bilan kengaytirish yoki aorta koarktatsiyasini stentlash kabi manipulyatsiyalar mavjud. Jarrohlik yondashuvlari eng koʻp qoʻllaniladigani boʻlib, murakkab rekonstruktiv amaliyotlar talab qilinadi. Masalan, Tetralogiya Fallotni va TGAni bir martalik rekonstruksiya qilish, HLHS uchun bosqichma bosqich (Norvud – Glenn – Fontan) operatsiyalari bajariladi. Agar tugʻma nuqsoni tuzatib boʻlmaydigan darajada ogʻir boʻlsa, yurak transplantatsiyasi tavsiya qilinadi. Umuman olganda, zamonaviy davolash usullari yordamida koʻp bemorlar bir marta yoki bir nechta protseduralardan soʻng odatdagidan farqli boʻlmagan hayot kechirishi mumkin.

Xulosa

Tugʻma yurak nuqsonlari pediatriyada eng koʻp uchraydigan tugʻma kasalliklar hisoblanadi. Ularning asosiy sababi homila davridagi yurak strukturasi rivojlanishidagi nuqsonlardir. Sianotik va asianotik guruhlariga boʻlib tasniflanadigan bu nuqsonlar yurakning aniq anatomik oʻzgarishlari bilan namoyon boʻladi. Zamonaviy diagnostika usullari (EKG, EKO, MRT, angiografiya) yordamida koʻplab yurak nuqsonlarini homiladorlikda ham aniqlash va tugʻilishdan keyin tezkor aralashish imkoniyati yaratilgan. Oʻz vaqtida qoʻllangan jarrohlik yoki kateter intervensiya tufayli bemorlar kattalikda sogʻlom holatda yashay oladi. Epidemiologik tadqiqotlar CHD tarqalishi va xavf omillarini oʻrganib, oldini olish choralari kuchaytirishga hissa qoʻymoqda. Tugʻma yurak nuqsonlarini yetarlicha chuqur oʻrganish va barqaror profilaktika choralari koʻrish natijasida bolalar oʻlimi va kasalliklarini kamaytirishga erishish mumkin.

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NERV HAMDA ENDOKRIN SISTEMALARI TUZILISHI VA ULARNING ORGANIZMDAGI VAZIFALARI

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Annotatsiya: Ushbu maqolamizda nerv sistemasi tuzilishi va uning vazifalarini o'rganish hamda tahlil qilish bo'yicha so'z boradi

Nerv sistemasi organizmni boshqaradi va barcha hujayralar, to'g'ridan-to'g'ri va organlar ishini o'zaro kuchayishini ta'minlaydi. Nerv sistemasi tuzilishi va ichki muhit ta'sirlarini qabul qiladi va ularga javob beradi. Nerv sistemasiga bog'liq holda inson kasb-hunar o'rganadi, ilm oladi, fikrlaydi, eslab qoladi, quvonchli, qayg'usi va tuyg'ularini ifodalaydi.

Kalit so'zlar: odam, nerv sistemasi, bosh miya, orqa miya.

Аннотация: В статье рассматриваются вопросы изучения и анализа строения нервной системы и ее функций. Нервная система управляет организмом и обеспечивает совместную работу всех клеток, а также органов, как напрямую, так и косвенно. Нервная система воспринимает и реагирует на структуру и воздействие внутренней среды. В зависимости от нервной системы человек осваивает профессию, приобретает знания, думает, помнит, выражает радость, грусть и эмоции.

Ключевые слова: человек, нервная система, головной мозг, спинной мозг.

Abstract: This article discusses the study and analysis of the structure and functions of the nervous system. The nervous system controls the body and ensures the mutual reinforcement of the work of all cells, directly and indirectly. The structure of the nervous system perceives and responds to the effects of the internal environment. Depending on the nervous system, a person learns a profession, acquires knowledge, thinks, remembers, expresses joy, sadness and emotions.

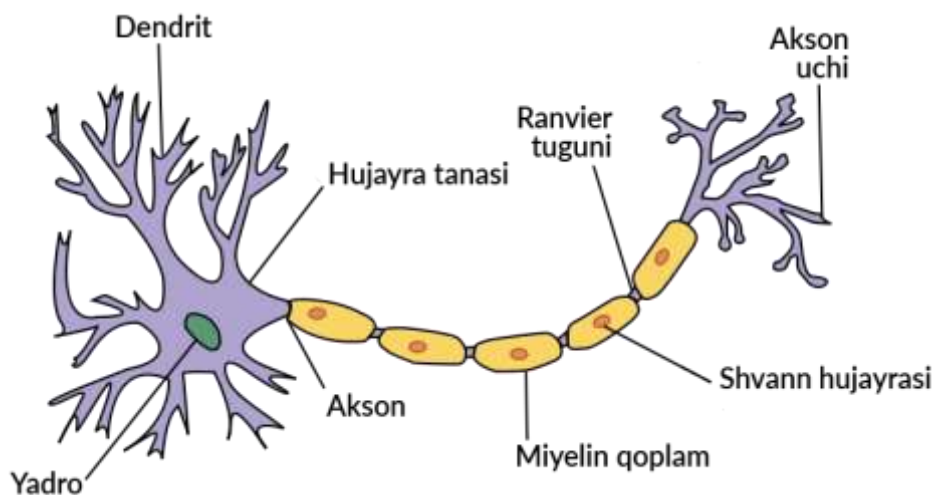
Keywords: human, nervous system, brain, spinal cord.

Odam bu — abstract fikrlash, nutq, introspeksiya qobiliyatli yuksak rivojlangan miyaga egadirlar. Bunday miya bilan odamlar mehnat qurollari ishlatishni o'rganib, boshqa tur hayvonlardan ilg'orlashib ketdilar. Odam ijtimoiy mehnat asosida shakllangan tafakkur va nutqqa ega bo'lishi, mehnat qurollari yasashi va atrof muhitga faol ta'sir ko'rsata olishi bilan boshqa tirik mavjudotlardan farq qiladi.

Nerv sistemasi joylashuviga ko'ra markaziy va periferik nerv sistemasiga ajraladi. Markaziy bo'lim bosh va orqa miyadan, periferik bo'limlardan chiqadigan nervlar va nerv tugunlaridan iborat. Markaziy va periferik bo'lim bir-biriga bog'liq holda ishlaydi. Bosh miya va orqa miya ham shunday shu kabi bir-biriga bog'liq holda faoliyat yuritadi.

Nerv sistemasi — elektr impulslardan foydalangan holda tashqi muhitdan ma'lumot qabul qiladi, uni qayta ishlaydi va unga javob beradi.

Nerv sistemasi hujayralari — Neyronlarning o'ziga xos tuzilishi ularga tana bo'ylab elektr impulslarini uzatish va qabul qilish imkonini beradi. Neyroglia hujayralari neyronlarni o'rab, tashqi muhitdan ajratib turadi va ularni himoyalaydi.



1-rasm

Barcha neyronlar odatda tuzilishi jihatidan *hujayra tanasi*, *dendrit* va *aksonlardan* iborat. Ularning bunday tuzilishi neyronlarning o'zaro aloqasini ta'minlovchi elektr impulslar, ya'ni **nerv impulslarini** uzatishda muhim ahamiyatga ega.

Neyronlar bajaradigan funksiyasiga ko'ra quyidagi turlarga bo'linadi:

Sezgi (sensor) neyronlari ko'z va quloq singari sezgi organlaridan impulslarni qabul qiladi.

Harakatlantiruvchi (motor) neyronlar muskul va bezlardan impulsni qabul qiladi. *Oraliq neyronlar* sezgi va harakatlantiruvchi neyronlar va boshqa oraliq neyronlar bo'ylab impulsni uzatadi.

Qo'zg'almagan neyronlarda natriy-kaliy nasosi orqali tartibga solinuvchi ionlar taqsimlanishi holati mavjud. Agar neyron kuchli signalni qabul qilsa, tinchlik potentsiali holatidan chiqib qo'zg'algan holatga o'tadi va *harakat potentsiali* deb ataluvchi elektr impulsini ishlab chiqaradi. Impuls boshlangandan so'ng, akson bo'ylab uning terminal qismi tomon harakatlanadi.

Nerv sistemasi qismlari

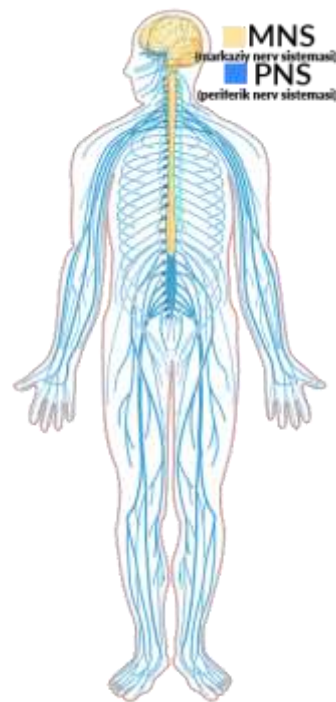
Nerv sistemasi ikki qism: **markaziy nerv sistemasi (MNS)** va **periferik nerv sistemasi (PNS)**dan tashkil topgan.

Markaziy nerv tizimi bosh va orqa miyadan iborat. Tanaga beriladigan barcha buyruqlar bosh miyada hosil qilinadi, orqa miya esa bosh miyani tanadagi boshqa nervlar bilan bog'lab turadi.

Periferik nerv tizimi ikki qismga bo'linadi:

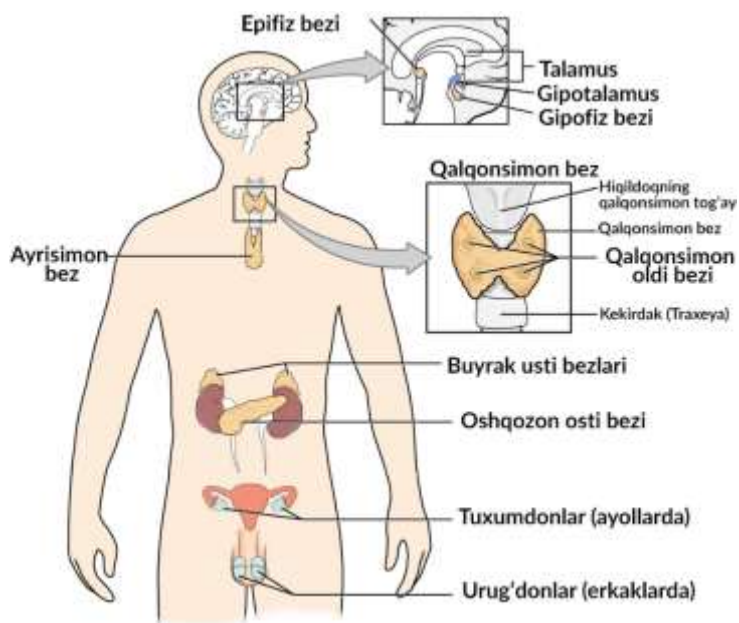
Somatik nerv tizimi (SNT) odam ixtiyoriga bog'liq harakatlar, masalan, muskullar harakatini boshqaradi. Shuningdek, u qo'l issiq plitaga tegganda undan qo'lni tortib olish kabi harakat reflekslarini ham boshqaradi.

Avtonom nerv tizimi (ANT) odam ixtiyoriga bog'liq bo'lmagan harakatlarni boshqaradi va qarama-qarshi faoliyat ko'rsatuvchi ikki qismga bo'linadi: simpatik va parasimpatik nerv sistemasi. Simpatik nerv tizimi "kurashish yoki qochish" javob reaksiyalarida aktivlashsa, parasimpatik nerv tizimi tinch holatlarda faol bo'ladi.



2-rasm

Endokrin tizimi — nerv tizimi singari **endokrin tizimi** ham tananing boshqarilishida ishtirok etadi. Elektr signallar o'rniga endokrin tizimi **gormonlar** deb ataluvchi kimyoviy signallardan foydalanadi. Ushbu gormonlar qon oqimi bo'ylab harakatlanib, organ va hujayralarning faoliyatini boshqaradi.



3-rasm

Asosiy gormon va bezlar

Gormon	U ishlab chiqariladigan bez	Ahamiyati
Tiroksin	Qalqonsimon bez	Metabolizmni boshqaradi
Adrenalin (epinefrin)	Buyragusti bezlari	“Kurashish yoki qochish” javob reaksiyasida qatnashadi
Kortizol	Buyragusti bezi	“Kurashish yoki qochish” javob reaksiyasida qatnashadi, metabolizm va immun sistemasini tartibga solib turadi
Estrogen	Tuxumdonlar	Asosan ayollarning jinsiy rivojlanishida muhim ahamiyatga ega
Testosteron	Urug‘donlarda, ba’zan buyragusti bezi va tuxumdonlarda	Asosan erkaklar jinsiy rivojlanishida muhim rol o‘ynaydi
Insulin	Oshqozon osti bezi	Qondagi qand miqdori va yog‘larning zaxiralanishini nazorat qiladi
Glyukagon	Oshqozon osti bezi	Qondagi qand miqdorini nazorat qiladi

Endokrin tizimining boshqarilishi

Endokrin tizimi gomeostazni ta'minlovchi manfiy qaytar bog'lanish mexanizmlari orqali boshqariladi. Ushbu usul orqali gormonlar konsentratsiyasi va ularning organ sistemalariga ta'siri tartibga solinadi.

Masalan, qondagi qand miqdori oshqozon osti bezi tomonidan ishlab chiqariluvchi insulin va glyukagon gormonlari yordamida boshqariladi.

Agar qonda qand miqdori baland bo'lsa, oshqozon osti bezi insulin gormonini ishlab chiqaradi. Insulin qondagi glyukoza miqdoriga ta'sir qilib, uning me'yordan ortib ketishiga yo'l qo'ymaydi.

Agar qondagi qand miqdori kamaysa, oshqozon osti bezi glyukagon gormonini ishlab chiqaradi. Bu gormon ta'sirida glikogen zaxiralari parchalanib, qondagi glyukoza miqdorini normal darajagacha ko'taradi.

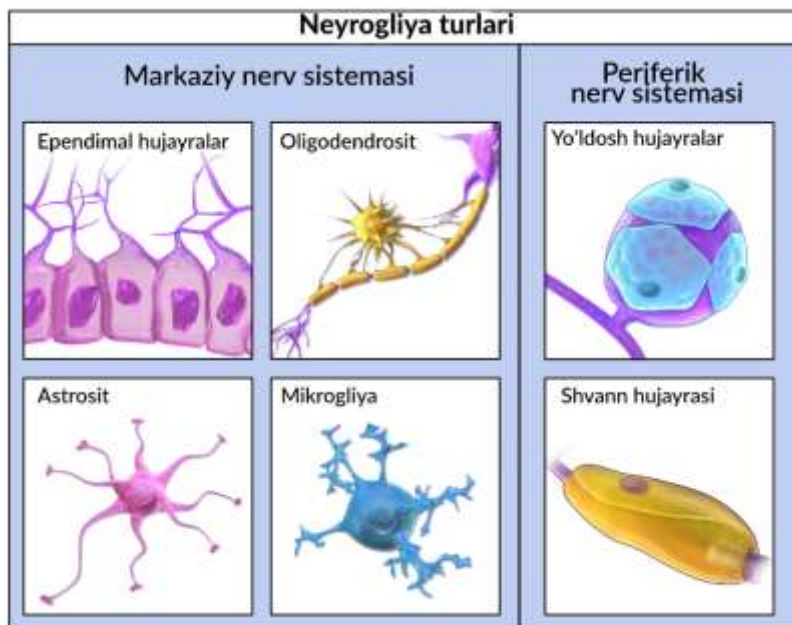


4-rasm

Qondagi qand miqdori endokrin tizimi tomonidan ishlab chiqariluvchi insulin va glyukagon gormonlari ta'sirida manfiy qaytar bog'lanish mexanizmi orqali boshqariladi.

Ko'p uchraydigan xatolar va noto'g'ri tushunchalar

Garchi neyronlar nerv tizimidagi eng ko'p uchraydigan hujayralar bo'lsa-da, lekin yagona nerv hujayralari emas! Aslida neyrogliya hujayralari soni neyronlardan 10 barobar ko'proq. Neyrogliya hujayralari neyronlarni himoya qiladi va akson atrofidagi miyelin parda bilan ta'minlaydi.



5-rasm

Gormonlar faqat ko'payish tizimi tarkibiga kirmaydi. Garchi testosteron yoki estrogen kabi gormonlar ko'payish sistemasiga aloqador bo'lsa-da, ushbu sistemaga taalluqli bo'lmagan juda ko'p gormonlar mavjud. Ko'plab gormonlar tanadagi doimiy funksiyalar, masalan, ochlik yoki uyqu kabilarni boshqaradi.

Garchi nerv tizimi ham, endokrin tizim ham tanamizni boshqarsa-da, ular o'rtasida ba'zi fundamental farqlar mavjud. Birinchidan, endokrin tizimi kimyoviy signallardan (bezlar ishlab chiqaruvchi gormonlar) foydalansa, nerv tizimi elektr signallaridan (nerv impulslari) foydalanadi. Nerv tizimi orqali signallarning uzatilishi neyronlar o'zaro bog'langani sababli juda tez, lekin ularning ta'siri qisqa vaqt davom etadi. Endokrin tizimida signallarning uzatilishi nisbatan sekin bo'lib, bunda gormonlar qon oqimi bo'ylab kerakli organga yetkaziladi. Lekin buning ta'siri uzoq muddatli bo'ladi.

XULOSA

Demak, nerv sistemasi inson organizmidagi muhim sistema hisoblanadi. U orqali inson organizmi o'zini o'zi boshqaradi. Va biz nerv sistemasitufayli tashqi va ichki muhit ta'sirlariga javob qaytaramiz. Nerv sistemasining vazifaviy tarkibiy birligi bu nerv hujayrasi bo'lib, u o'zidan chiqayotgan o'simalari bilan birga neyron deb ataladi. Nerv sistemasi markaziy va periferik bo'limlardan iborat. Markaziy bo'limga bosh miya va orqa miya kiradi. Bosh miya miya qutisi ichida joylashgan bo'lib, u 2 ta yarimsharlardan iborat. Orqa miya esa umurtqa pog'onasi nayida

joylashgan. Periferik bo‘lim esam bosh miya va orqa miyadan chiqadigan nerv tolalari vanerv tugunlaridan iborat.

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NAFAS OLISH TIZIMI ANATOMIYASI. O'PKA

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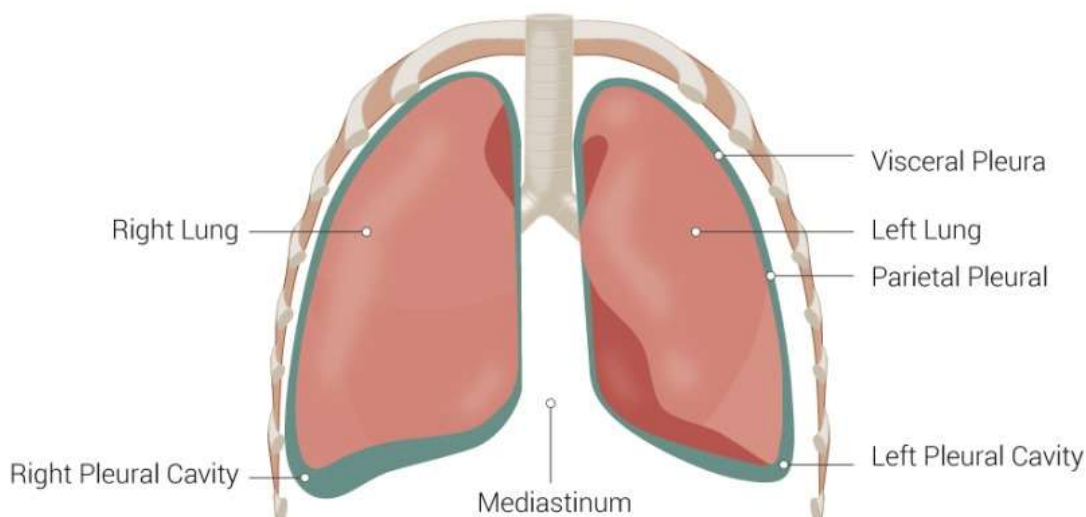
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Annotatsiya. Nafas olish tizimi o'pka, nafas yo'llari (traxeya, bronxlar va bronxiolalar), diafragma, ovoz qutisi, tomoq, burun va og'izdan iborat. Uning asosiy vazifasi kislorod bilan nafas olish va karbonat angidridni nafas olishdir. Shuningdek, u sizni zararli zarralar va mikroblardan himoya qilishga yordam beradi va hidlash va gapirish imkonini beradi. Ushbu maqola nafas olish tizimi anatomiyasi, embriologiyasi, qon bilan taminlanishi va nerv tizimi haqida yoziladi.

Kalit so'zlar: Kislorod, qon, o'pka parenximasi, segmental bronxlar, diafragma gumbazi, plevra, o'pka ildizi.

Kirish

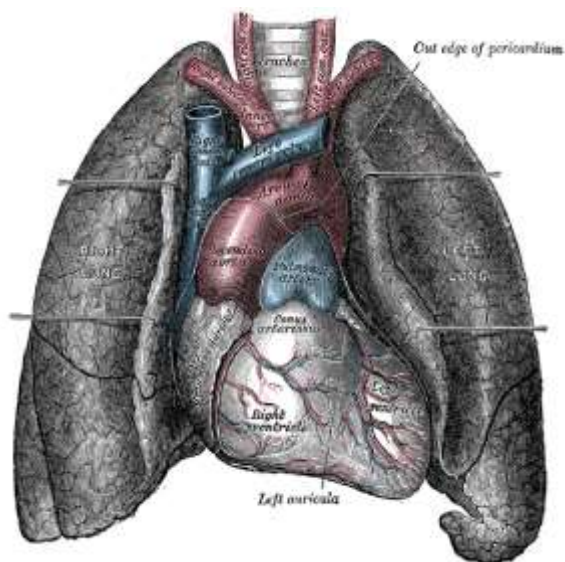
O'pkaning asosiy vazifasi gaz almashinuvini ta'minlashdir. Kislorod qon oqimiga atrof-muhitdan alveolalar orqali kiradi. To'qimalar almashinuvidan karbonat



angidrid o'pka orqali tanani tark etadi. O'pka tomirlari ushbu funktsiyalarni qo'llab-quvvatlash uchun tashkil etilgan. O'pka ko'krak bo'shlig'idagi qovurg'alar bilan himoyalangan bo'lib, yurakning har ikki tomonida joylashgan. Ikki qavatli plevra membranalar har bir o'pkani qoplaydi. Ko'krak qafasi tarkibi va ko'krak qafasi qoplamalarining aloqasi). O'pka parenximasi havo yo'llarining murakkab shoxlanishidan hosil bo'ladi. O'pkadagi murakkab nerv nazorati nafas olish funktsiyasini, shu jumladan havo yo'llari kalibrini, shamollatish va himoya reflekslarini to'g'ri tartibga solishni ta'minlaydi.

Tuzilishi va funktsiyasi

Qoida tariqasida, o'pkalar shimgichli tuzilishga va pushti-kulrang rangga ega. O'pkaning cho'qqisi, asosi, 3 ta yuzasi va 3 ta chegarasi bor. Cho'qqisi 1-qovurg'a ustida joylashgan va bachadon bo'yni plevrasi bilan qoplangan. Asos o'pkaning diafragma ustida joylashgan botiq pastki yuzasidir. O'pkaning qovurg'ali, mediastinal va diafragma yuzasi mavjud. Kostyum yuzasi kosta plevrasi, sternum va qovurg'alar bilan bog'liq. Kostyum yuzasi, shuningdek, old va orqa tomondan mediastin yuzasiga, pastki tomondan esa diafragma yuzalariga qo'shiladi. Mediastinal sirt har bir o'pkaning medial tomonida joylashgan bo'lib, u perikard va yurakni o'z ichiga olgan o'rta mediastin bilan bog'liq. Diafragma yuzasi (tayanch) botiq bo'lib, diafragma gumbaziga tayanadi. Jigar tufayli o'ng gumbaz chapdan balandroq. 3 ta chegaraga old, orqa va pastki chegaralar kiradi. O'pkaning oldingi chegarasi plevral refleksga to'g'ri keladi va chap o'pkada yurak tirqishi - chap yurak qorinchasini joylashtiradigan bo'g'imga ega. Yupqa pastki chegara o'pka asosini qovurg'a yuzasidan ajratib turadi. Qalin orqa chegara C7 dan T10 umurtqalarigacha, o'pka cho'qqisidan pastki chegaragacha cho'ziladi.



O'ng va chap o'pkaning strukturaviy tuzilishi o'xshash, ammo assimetrikdir. O'ng o'pka o'ng yuqori (RUL), o'rta (RML) va pastki (RLL) bo'laklardan iborat. Chap o'pka chap yuqori (LUL) va pastki (LLL) loblardan iborat. O'ng o'pkaning 3 ta bo'lagini qiya va gorizontalar yoriqlar ajratib turadi. Qiyma yoriq RML va RLL ni ajratadi, gorizontalar yoriq esa

RUL va RML ni ajratadi. Chap o'pkada faqat LUL va LLLni ajratib turadigan oblik yoriq mavjud.

Loblar o'ziga xos segmental bronxlar bilan bog'liq bo'lgan segmentlarga bo'linadi. Segmental bronxlar - asosiy bronxdan kelib chiqadigan 2-tartib shoxlaridan (lobar bronxlar) 3-tartib shoxlari.

O'ng o'pka 10 ta segmentdan iborat. RUL 3 ta segmentga ega: apikal, old va orqa. RML medial va lateral segmentlarga ega, RLL esa yuqori, medial, old, lateral va orqa segmentlarga ega. Chap o'pka lobar bo'linishiga qarab 8 dan 9 gacha segmentlarga ega. Umuman olganda, LUL 4 ta segmentga ega: old, apikopsteror, pastki va yuqori lingular. LLL 4 yoki 5 ga ega, lekin ko'pincha lateral, anteromedial, yuqori va orqa segmentlarga ega.

Hilum o'pkaning mediastinal yuzasining markazida joylashgan bo'lib, 5-7-ko'krak umurtqalarining old tomonida joylashgan. Hilum o'pka ildizini tashkil etuvchi turli tuzilmalar o'pkaga kirish va chiqish uchun o'tadigan hududdir. Hilum plevra bilan o'ralgan bo'lib, u pastki tomonga cho'ziladi va o'pka ligamentini hosil qiladi. Hilumda asosiy bronxlar, o'pka tomirlari, frenik asab, limfa yo'llari, tugunlar va bronxial tomirlar mavjud. Oldindan orqaga qarab, hilumdagi tartib vena, arteriya va bronxdir. Plevra bo'shlig'i o'pka va ko'krak devorining ichki yuzasi o'rtasida joylashgan suyuqlik bilan to'ldirilgan nozik bo'shliqdir. Bu potentsial bo'shliq 2 ta seroz membrana qatlami bilan qoplangan: o'pka yuzalarini qoplaydigan visseral plevra va ko'krak devorining ichki yuzasini qoplaydigan parietal plevra. Bu membranalar plevra yuzalarini moylaydigan va nafas olish paytida ishqalanishni kamaytiradigan oz miqdorda plevra suyuqligini ajratib turadi.

O'pkaning asosiy vazifasi gaz almashinuvini rag'batlantirishdir, bu asosan alveolalarda sodir bo'ladi. Ba'zi farmakologik vositalar, masalan, uchuvchi anesteziklar va inhaler bronxodilatatorlar ham o'pkada metabollanishi va tozalanishi mumkin.

I turdagi pnevmositlar alveolalar va qon oqimi o'rtasida kislorod va karbonat angidridning tarqalishini osonlashtirib, gaz almashinuvida ishtirok etadi. II turdagi pnevmositlar o'pka sirt faol moddasini, oqsillar va lipidlar aralashmasini chiqaradi, bu alveolalar ichidagi sirt tarangligini kamaytiradi, nafas olish paytida ularning qulashini oldini oladi va nafas olish paytida o'pkaning kengayishini osonlashtiradi. II turdagi pnevmositlar, shuningdek, I tipdagi shikastlangan hujayralar o'rnini bosuvchi progenitor hujayralar bo'lib xizmat qiladi. Alveolyar makrofaglar begona zarralarni, patogenlarni va hujayra qoldiqlarini fagotsitozlaydi va yo'q qiladi va shuning uchun

o'pka gomeostazini saqlash va nafas olish yo'llari infeksiyalaridan himoya qilishda juda muhimdir.

Qon-havo to'sig'i o'pkada samarali gaz almashinuvini osonlashtiradi. Kislorod alveolyar havodan kapillyar qonga tarqaladi, karbonat angidrid esa teskari yo'nalishda harakat qiladi. Kohning teshiklari qo'shni alveolalar o'rtasida kollateral shamollatish imkonini beradi. Ushbu interalveolyar aloqalar, ayniqsa, mintaqaviy o'pka qulashi yoki obstruksiyasi holatlarida havo harakati va tarqalishi uchun yo'lni ta'minlaydi. Kollateral ventilyatsiya alveolalar ichidagi bosimni tenglashtirishga yordam beradi, o'pkaning bir tekis inflyatsiyasini ta'minlaydi va gaz almashinuvini yaxshilaydi. Kohn teshiklari o'pka funksiyasiga hissa qo'shadi va nafas olish samaradorligini saqlashda, ayniqsa surunkali obstruktiv o'pka kasalligi yoki pnevmoniya kabi holatlarda rol o'ynashi mumkin. Yosh bolalarda Kohn teshiklari kam rivojlangan.

O'pka embriologiya

Pastki nafas a'zolari — halqum, traxeya, bronxlar va o'pkalar embrion hayotining 4-haftasida endodermal kaudal halqumning qorin bo'shlig'ining o'rtacha o'sishidan rivojlana boshlaydi, keyinchalik u laringotrakeal nay yoki nafas yo'llarining divertikulini hosil qiladi. Divertikulning endodermal qoplamidan halqum, traxeya, bronxlar va o'pka alveolalarida epiteliy va bezlar hosil bo'ladi. Atrofdagi splanxnik mezoderma nafas a'zolarining xaftaga, silliq mushaklari va biriktiruvchi to'qimalarini hosil qiladi. Nafas olish divertikullari dastlab oldingi ichak bilan aloqa qiladi. Traxeofozofagial septum mezodermadan paydo bo'lib, oldingi ichakning kranial qismini ventral va dorsal segmentlarga ajratadi. Ventral segmentdan traxeya va o'pka kurtaklarini hosil qiluvchi laringotraxeal nay hosil bo'ladi. Dorsal segment qizilo'ngachni hosil qiladi. Nafas olish divertikullari kranial bo'ylab cho'zilib, traxeyani, kaudal bo'ylab o'ng va chap o'pka kurtaklarini hosil qiladi.

Rivojlanishning 5-haftasi atrofida o'pka kurtaklari bronxial kurtaklarga aylanadi, ular kengayib, o'ng va chap asosiy bronxlarni hosil qiladi. O'ng asosiy bronxdan 3 ta ikkilamchi yoki lobar bronxlar, chap asosiy bronxlar esa 2 ta. Bu ikkilamchi bronxlar pastki va yon tomonga o'sib, perikardioperitoneal kanallar va primitiv plevra bo'shlig'iga kiradi. Keyingi rivojlanishi bilan ikkilamchi bronxlar o'ng o'pkada 10 ta uchinchi yoki segmental bronxlar va chapda 8 dan 9 gacha bo'lgan bronxlar hosil bo'lib, kattalar o'pkasining bronxopulmoner segmentlarini tashkil qiladi. Taxminan 24-haftada intrasegmental shoxlarga va nafas olish bronxiolalariga bo'linmalarning

taxminan 17 avlodi hosil bo'ladi. Postnatal hayotda qo'shimcha 6 dan 7 gacha bo'linish sodir bo'ladi.

O'pka rivojlanishi bir-birining ustiga chiqadigan 4 bosqichni o'z ichiga oladi: psevdoglandular, kanalikulyar, o'pka yoki terminal qop va alveolyar. Embrion va xomilalik o'pka rivojlanish jadvali). Psevdoglandular bosqich nafas olish yo'llarining bir nechta shoxlangan avlodlari bilan tavsiflanadi, terminal bronxiolalarni o'rnatadi. Ushbu bosqichda nafas olish bronxiolalari yoki alveolalari yo'q. Kanalikulyar bosqichning o'ziga xos xususiyatlari - kichikroq nafas olish bronxiolalari, alveolyar kanallar, intensiv angiogenez, qon-havo to'siqlari va II turdagi pnevmositlar tomonidan minimal sirt faol moddalar ishlab chiqarish. II turdagi pnevmositlar etarli darajada sirt faol moddalar ishlab chiqarsa, homilaning omon qolishi mumkin. Terminal qop bosqichida ko'proq terminal xaltachalar yoki ibtidoiy alveolalar hosil bo'ladi va terminal qoplar kengayishda davom etadi. II turdagi pnevmositlar ko'payish va etilishda davom etib, sirt faol moddalar ishlab chiqarishni oshiradi. Alveolyar bosqich etuk alveolyar shakllanishni va sirt faol moddalar ishlab chiqarishni yanada oshirishni o'z ichiga oladi.

O'pkaning qon ta'minoti va limfa tomirlari

O'pkaning qon tomirlari o'ziga xosdir. O'pka arteriyasi yurakdan kislorodsiz qonni o'pka parenximasi tomonidan kislorod bilan ta'minlaydi. Shu bilan birga, bronxial arteriyalar tirik qolish uchun o'pka parenximasini kislorod bilan ta'minlaydi. Asosiy o'pka arteriyasi o'ng qorinchadan chiqadi va chap va o'ng asosiy o'pka arteriyalariga ikkiga bo'linadi. O'pka arteriyasi shoxlari odatda bronxial daraxt shoxlari bo'ylab tarqaladi va kengayadi, oxir-oqibat alveolyar kapillyarlarga aylanadi. O'pka venalari alveolyar kapillyarlardan kislorodli qonni va bronxial va visseral plevra tomirlaridan oz miqdorda kislorodsizlangan qonni oladi. Ushbu aralashtirish o'pka tomirlarida qonning kislorod bilan to'yinganligini tizimli tarqatish uchun yurakning chap tomoniga qaytishdan oldin biroz pasaytiradi. To'rtta o'pka venalari chap atriumda birlashadi. Bronxial qon aylanishi tizimli qon aylanishining bir qismidir. Chap bronxial arteriya torakal aortadan 2 ta - yuqori va pastki shoxchalar shaklida chiqadi. Yagona o'ng bronxial arteriya odatda o'ng orqa interkostal yoki chap yuqori bronxial arteriyadan yoki to'g'ridan-to'g'ri aortadan chiqadi. Bronxial venalar kislorodsizlangan qonni to'playdi va azigos venaga bo'shaydi. Yuzaki va chuqur limfa pleksuslari o'pkalarni drenajlaydi. O'pka parenximali limfa birinchi bo'lib intraparenximal tugunlarga, so'ngra peribronxial tugunlarga tushadi. So'ngra limfa yo'llari

traxeobronxial va paratraxeal limfa tugunlariga, bronxomediastinal magistralga va ko'krak yo'liga oqadi.

Nervlari

O'pka innervatsiyani ikkita asosiy manbadan oladi: parasempatik va simpatik innervatsiyadan iborat o'pka pleksusi va frenik asab. O'pka pleksusi o'pka to'qimasini, o'pka tomirlarini va bronxlarni o'rab oladi. Pleksus ichidagi vagal nerv shoxlari parasempatik stimulyatsiyani ta'minlaydi, simpatik magistral shoxlari esa simpatik innervatsiyani ta'minlaydi. Parasempatik impulslar bronxokonstriksiyani, o'pka tomirlarining kengayishini va bez sekretsiasini oshiradi. Simpatik otishni o'rganish bronxodilatatsiyaga, o'pka tomirlarining siqilishiga va bez sekretsiasining pasayishiga olib keladi. Frenik nerv C3 dan C5 gacha bo'lgan nerv ildizlaridan kelib, tolali perikardni, visseral plevra qismlarini va diafragmani ta'minlaydi.

Klinik ahamiyati

Turli xil ko'krak sharoitlari fizik tekshiruv anormalliklarini keltirib chiqaradi. Masalan, ko'krak qafasi odatda perkussiyada rezonansga ega, ammo suyuqlik to'planishi uni zerikarli qilishi mumkin. Auskultatsiyada xirillash ko'pincha astmaning kuchayishi kabi bronxokonstriksiyaga bog'liq, ammo u yurak etishmovchiligi bo'lgan bemorlarda ham namoyon bo'lishi mumkin. Yoriqlar yoki toshmalar o'pka shishi natijasida paydo bo'ladi, bu konjestif yurak etishmovchiligi, interstitsial o'pka kasalligi va pnevmoniya kabi kasalliklardan kelib chiqishi mumkin. Rhonxlar ko'pincha surunkali bronxit va mukovistsidozda bo'lgani kabi, kattaroq nafas yo'llarining sekretsiasini bilan bog'liq bo'lib, obstruktsiyani keltirib chiqaradi.

O'pka rentgen nurlarida qora rangga ega, chunki havo shaffof. Bemordan nafas olishni so'rash o'pka vizualizatsiyasini optimallashtiradi, ammo sensori o'zgargan yoki og'ir nafas olish qiyinlishuvi bo'lgan bemorlarda optimallashtirish odatda mumkin emas.

Torasentez - bu plevra bo'shlig'idan suyuqlikni olish uchun igna ishlatadigan tibbiy protsedura. Ushbu protsedura terapevtik yoki diagnostik bo'lishi mumkin. Torasentez plevra bo'shlig'i patologiyasidan kelib chiqadigan ko'krak og'rig'ini yoki nafas qisilishini bartaraf etishi mumkin. Diagnostik torasentez aniq davolashni buyurish uchun plevral efüzyon sababini aniqlashga yordam beradi.

Pnevmoniya - bu o'pkaning infeksiyasi va yallig'lanishi, bu plevral efüzyona olib kelishi mumkin. Bemorlarda isitma, yo'tal, ko'krak og'rig'i, ko'ngil aynishi va qayt qilish mumkin.

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BOLALARDA TANQISLIK ANEMIYALARI (TEMIR, OQSIL, VITAMINLAR YETISHMOVCHILIGI) ETIOLOGIYASI

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Annotatsiya: Ushbu maqolada bolalar orasida keng tarqalgan tanqislik anemiyalarining — temir, oqsil va vitaminlar yetishmovchiligi bilan bog‘liq holatlarning etiologiyasi yoritilgan. Anemiyaning bolalar salomatligiga salbiy ta’siri, uning rivojlanish omillari, xavf guruhlari va kasallikning oldini olish yo‘llari tahlil qilingan. Tadqiqotda bolalarda uchraydigan anemiya turlari va ularning yuzaga kelishiga sabab bo‘luvchi omillar haqida tibbiy-nazariy asoslar bilan bir qatorda amaliy tavsiyalar ham berilgan. Mazkur maqola pediatrlar, umumiy amaliyot shifokorlari va tibbiyot yo‘nalishidagi talabalar uchun foydali manba bo‘lib xizmat qiladi.

Kalit so‘zlar: bolalarda anemiya, temir tanqisligi, oqsil yetishmovchiligi, vitamin yetishmovchiligi, tanqislik anemiyalari, anemiya etiologiyasi, bolalar salomatligi, profilaktik chora-tadbirlar, oziqlanish muammolari, pediatriyada anemiya.

Kirish.

Bugungi kunda bolalar salomatligi muammolari orasida anemiya, xususan, tanqislik anemiyalari muhim o‘rin egallaydi. Tanqislik anemiyasi deganda organizmda gemoglobin miqdorining kamayishi va shu bilan birga temir, oqsil hamda ayrim vitaminlar (ayniqsa B12 va foliy kislota) yetishmovchiligi natijasida yuzaga keladigan holat tushuniladi. Bolalik davri organizmning faol o‘sinh va rivojlanish bosqichi bo‘lgani sababli, bu davrda zarur bo‘lgan oziq moddalarning yetarli miqdorda bo‘lmashligi turli kasalliklarning, xususan, anemiyaning rivojlanishiga sabab bo‘ladi. Tanqislik anemiyalari bolalarda umumiy immunitetning pasayishi, aqliy va jismoniy rivojlanishning susayishi, asab tizimi faoliyatining buzilishi kabi salbiy oqibatlariga olib keladi. Ayniqsa, erta yoshdagi bolalarda anemiya og‘ir kechadi va uzoq muddatli asoratlarga sabab bo‘lishi mumkin. Shu sababli bu kasallikning etiologiyasini chuqur o‘rganish, uning oldini olish, erta tashxislash va samarali davolash choralarini ishlab chiqish dolzarb vazifalardan biridir. Ushbu maqolada bolalarda uchraydigan tanqislik

anemiylarining asosiy sabablari, ularning kelib chiqish mexanizmlari hamda profilaktika va davolashning zamonaviy yondashuvlari yoritib beriladi.

Asosiy qism.

Tanqislik anemiylari bolalarda uchraydigan eng ko‘p tarqalgan qon kasalliklaridan biridir. Ular asosan temir, oqsil va vitaminlar kabi hayotiy muhim moddalarning yetishmovchiligi natijasida yuzaga keladi. Bu moddalarning organizmdagi o‘rni beqiyos bo‘lib, ularning tanqisligi qon hosil bo‘lish jarayonining izdan chiqishiga olib keladi. Har bir moddaning tanqisligi o‘ziga xos klinik ko‘rinishlarga va oqibatlariga ega bo‘lganligi sababli ularni alohida-alohida ko‘rib chiqish zarur.

1. Temir tanqisligi anemiyasi

Temir tanqisligi anemiyasi bolalarda eng ko‘p uchraydigan tanqislik anemiyasi turi hisoblanadi. Temir gemoglobin tarkibidagi asosiy element bo‘lib, kislorodning to‘qimalarga yetkazilishida muhim rol o‘ynaydi. Bola organizmi o‘sib borayotgani sababli, u doimiy ravishda temirga ehtiyoj sezadi. Temir tanqisligining asosiy sabablari quyidagilar:

- Yetarli va to‘g‘ri ovqatlanmaslik (ayniqsa hayvoniy mahsulotlarni kam iste’mol qilish);
- Chaqaloqlik davrida onaning kamqonligi yoki chaqaloqni faqat ona suti bilan uzoq vaqt boqish;
- Me‘da-ichak kasalliklari natijasida temirning yomon so‘rilishi;
- Parazit infeksiyalar (askaridoz, giardioz va boshqalar) tufayli temirning yo‘qotilishi. Temir tanqisligi anemiyasi sekin-asta rivojlanadi. Bolalarda rangparlik, tez charchash, ishtahaning pasayishi, jismoniy va aqliy faollikning susayishi kuzatiladi. Davolashda temir preparatlari bilan birga temirga boy oziq-ovqat mahsulotlarini iste’mol qilish tavsiya etiladi.

2. Oqsil yetishmovchiligi bilan bog‘liq anemiya. Oqsil organizmda hujayra tuzilishi va gemoglobinning sintezi uchun zarur bo‘lgan asosiy moddalardan biridir. Bola organizmida oqsil yetishmovchiligi kuzatilganda, eritrotsitlar soni kamayadi va gemoglobin darajasi pasayadi. Bu turdagi anemiya ko‘pincha umumiy distrofik holatlar bilan kechadi.

Oqsil yetishmovchiligi quyidagi omillar ta’sirida rivojlanadi:

- Yomon ovqatlanish va balansi buzilgan dieta;
- Ovqat hazm qilish a'zolarining kasalliklari;
- Surunkali infeksiyalar.

Klinik belgilar temir tanqisligi anemiyasiga o'xshash bo'lsa-da, bu holatda bolalarda mushaklar zaifligi, o'sishning sekinlashuvi, umumiy immunitetning tushib ketishi bilan birga yurak faoliyatining buzilishi ham kuzatiladi. Davolash oqsilga boy ovqatlar (go'sht, sut mahsulotlari, tuxum, dukkaklilar) bilan birga oqsil preparatlari qo'llanilishi orqali olib boriladi.

3. Vitamin yetishmovchiligi (B12 va foliy kislotasi) Vitamin B12 va foliy kislotasi megaloblast anemiyasining rivojlanishida muhim rol o'ynaydi. Ushbu vitaminlar DNK sintezi va eritrotsitlarning shakllanishida ishtirok etadi. Ularning yetishmovchiligi natijasida katta, ammo funktsional jihatdan to'liq bo'lmagan eritrotsitlar hosil bo'ladi.

B12 vitamini yetishmovchiligining sabablari:

- Vegetarian ovqatlanish (hayvoniy mahsulotlardan voz kechish);
- Ichaklarning so'rish funksiyasining buzilishi (masalan, seliakiyadek kasalliklar);
- Autoimmun gastrit.

Foliy kislotasi esa ko'pincha yomon ovqatlanish, homiladorlik davrida yetarlicha qabul qilinmaganligi sababli bola tanasida yetishmovchilik bilan namoyon bo'ladi. Ushbu vitaminlar tanqisligi bilan bog'liq anemiyalar og'ir kechishi, asab tizimi buzilishlari, hushyorlikning pasayishi, koordinatsiya muammolari kabi klinik belgilar bilan namoyon bo'ladi. Davolashda B12 vitamini in'eksion shaklda, foliy kislotasi esa og'zaki tarzda beriladi.

4. Anemiyaning oldini olish va profilaktikasi. Bolalarda tanqislik anemiyalarining oldini olish uchun quyidagi choralar muhim ahamiyatga ega:

- Bolani to'g'ri va muvozanatli ovqatlantirish (temir, oqsil va vitaminlarga boy mahsulotlar bilan);
- Onalarni homiladorlik davridan boshlab temir va foliy kislotasi preparatlari bilan ta'minlash;
- Yuqori xavf guruhiga kiruvchi bolalarni (erta tug'ilganlar, ko'p kasallanuvchan bolalar) muntazam tibbiy nazoratda saqlash;

– Ichki kasalliklar va parazit infeksiyalarni vaqtida davolash.

Xulosa:

Bolalarda tanqislik anemiyalari — bu temir, oqsil va vitaminlar (ayniqsa B12 va foliy kislotasi) yetishmovchiligi natijasida yuzaga keladigan, organizmning umumiy rivojlanishiga salbiy ta'sir ko'rsatuvchi jiddiy patologiyalardan biridir. Bu turdagi anemiyalar bolaning jismoniy, aqliy va emotsional rivojlanishini izdan chiqaradi, immunitetni pasaytiradi va turli asoratlarga olib keladi. Temir tanqisligi anemiyasi eng ko'p uchraydigan shakl bo'lib, uni erta aniqlash va davolash bolalar sog'lig'ini saqlashda muhim ahamiyat kasb etadi. Anemiyaning asosiy sabablari noto'g'ri ovqatlanish, surunkali kasalliklar, ichakda so'rilish buzilishlari va parazitlar kasalliklar bilan bog'liq. Shuning uchun kasallikni davolash bilan birga uning oldini olish choralari — to'g'ri ovqatlanishni tashkil etish, vitamin va mikroelementlarga boy mahsulotlarni ratsionga kiritish, bolalarni doimiy tibbiy ko'rikdan o'tkazish muhimdir. Ushbu masalaga bo'lgan dolzarb yondashuv, ayniqsa pediatrlar va oilaviy shifokorlar tomonidan bolalarda anemiyaning erta aniqlash va samarali davolashda muhim rol o'ynaydi.

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