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QON VA LIMFA: QON SURTMALARIDAGI LEYKOTSIT TURLARINI TO‘G‘RI AJRATISH

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Annotatsiya

Ushbu maqolada qon va limfa tizimida leykotsitlarning morfologik va funksional turlarini aniqlash, ularni qon surtmalarida to‘g‘ri ajratish metodologiyasi ko‘rib chiqiladi. Ilmiy tadqiqotlar asosida, gistologiya, sitalogiya va embriologiya fanlari doirasida leykotsitlarning morfologik xususiyatlari, ularning differensial diagnostikasi va avtomatlashtirilgan tasvir tahlili usullari tahlil qilinadi.

Kalit so‘zlar: Leykotsitlar, Qon surtmalar, Gistologiya, Sitalogiya, Embriologiya, Qon va limfa tizimi, Leykotsit turlari, Morfologik tahlil, Avtomatlashtirilgan tasvir tahlili, , Neutrofillar, Limfotsitlar, Monotsitlar, Eozinofillar, Bazofillar

Аннотация

В данной статье будет рассмотрена методика определения морфологических и функциональных типов лейкоцитов в крови и лимфатической системе, правильного их разделения в мазках крови. На основе научных исследований в рамках дисциплин гистологии, цитологии и эмбриологии анализируются морфологические особенности лейкоцитов, их дифференциальная диагностика и методы автоматизированного анализа изображений.

Ключевые слова: Лейкоциты, Мазки крови, Гистология, Цитология, Эмбриология, Кровеносная и лимфатическая система, Типы лейкоцитов, Морфологический анализ, Автоматизированный анализ изображений, Нейтрофилы, Лимфоциты, Моноциты, Эозинофилы, Базофилы

Abstract: This article will consider the methodology for determining the morphological and functional types of leukocytes in the blood and lymphatic system,

their correct separation on blood smear. Based on scientific research, within the disciplines of histology, cytology and Embryology, morphological characteristics of leukocytes, methods of their differential diagnosis and automated image analysis are analyzed.

Keywords: Leukocytes, Blood smears, Histology, Cytology, Embryology, Blood and lymphatic system, Types of leukocytes, Morphological analysis, Automated image analysis, Neutrophils, Lymphocytes, Monocytes, Eosinophils, Basophils.

Kirish

Qon va limfa tizimi organizmning asosiy himoya tizimlaridan biri bo'lib, leykotsitlar (oq qon hujayralari) bu tizimning muhim komponentlaridir. Leykotsitlar turli morfologik va funksional xususiyatlarga ega bo'lib, ularni to'g'ri aniqlash va ajratish klinik diagnostika va ilmiy tadqiqotlar uchun muhim ahamiyatga ega.

Leykotsit turlari va ularning morfologik xususiyatlari

Leykotsitlar ikki asosiy guruhga bo'linadi: granulotsitlar va agranulotsitlar.

Granulotsitlar

Neutrofillar: 12–15 μm diametrda bo'lib, 3–5 segmentli yadroga ega. Sitoplazmasida noaniq granullar mavjud bo'lib, ular yorug'lik mikroskopida ko'rinmaydi, bu esa sitoplazmaga och pushti rang beradi.

Eozinofillar: Ikki bo'lakli yadroga ega bo'lib, sitoplazmasida katta eozinofilik granullar mavjud. Bu granullar qizil-pushti rangda bo'yaladi.

Bazofillar: 12–15 μm diametrda, S-shaklidagi yadroga ega. Sitoplazmasida katta, notekis granullar mavjud bo'lib, ular ko'kdan to'q binafsha ranggacha bo'yaladi.

Agranulotsitlar

Limfotsitlar: Taxminan 25% leykotsitlarni tashkil etadi. Kichik limfotsitlar eritrotsitlar bilan o'lchamda o'xshash bo'lib, sferik yadro va oz miqdorda sitoplazmaga ega. Katta limfotsitlar esa indentsiyalangan yadro va ko'proq sitoplazmaga ega bo'lib, azurofil granullarga ega.

Monotsitlar: Leykotsitlarning eng yirik turlaridan biri bo'lib, 12–15 μm diametrda. Yadrosi katta, C-shaklida bo'lib, sitoplazmasi ko'k-jigarrang rangda bo'yaladi.

Avtomatlashtirilgan tasvir tahlili va leykotsitlarni ajratish

So'nggi yillarda, leykotsitlarni qon surtmalarida avtomatik aniqlash va ajratish bo'yicha bir qator tadqiqotlar olib borilgan. Masalan, Oksford universiteti olimlari tomonidan ishlab chiqilgan metodda, qon surtmalaridagi oq qon hujayralarini aniqlash va segmentatsiya qilish uchun mashina o'rganish va tasvir tahlili usullari qo'llanilgan. Ushbu metod 96.37% aniqlik bilan oq qon hujayralarini aniqlashga erishgan.

Shuningdek, leykotsitlarni avtomatik ajratish uchun rang, geometrik va tekstura xususiyatlariga asoslangan metod ishlab chiqilgan. Bu metod yordamida leykotsitlar 93% dan yuqori aniqlik bilan to'g'ri klassifikatsiya qilingan.

Mavzuning bugungi kunda dunyo bo'yicha dolzarbligi

Qon va limfa tizimi, ayniqsa, leykotsitlarning turlari va ularni to'g'ri ajratish metodikasi butun dunyo bo'yicha dolzarb masalalardan biridir. Sababi:

Yuqori aniqlikdagi diagnostika ehtiyoji

Leykotsitlar soni va morfologiyasidagi o'zgarishlar ko'plab kasalliklar — infeksiyalar, yallig'lanish, autoimmun va onkologik kasalliklarni erta aniqlashda muhim diagnostik mezon hisoblanadi. Shuning uchun ularni to'g'ri ajratish zamonaviy laboratoriyalar uchun zaruratdir.

Yangi pandemiyalar va immunitet tadqiqotlari

COVID-19 pandemiyasi davrida va undan keyin butun dunyoda immunitet tizimiga, xususan, leykotsitlarning holatiga bo'lgan ilmiy va klinik e'tibor keskin oshdi. Leykosit turlari orqali bemorlarning kasallik og'irligi va immun javobi baholanmoqda.

Gemato-onkologik tadqiqotlarning rivojlanishi

Qon saratonlari, ayniqsa leykemiyalarni aniqlashda aynan leykotsitlarning morfologik o'zgarishlarini erta bosqichda aniqlash muhim sanaladi. Shuning uchun bu mavzu hematologiya va onkologiya fanlarida yetakchi yo'nalishlardan biri hisoblanadi.

ASOSIY QISM

Qon va limfa tizimi: leykotsitlarning biologik va morfologik roli

Qon va limfa tizimi organizmning himoya, transport va regulyator funksiyalarini ta'minlaydi. Leykotsitlar esa bu tizimning asosiy hujayralari bo'lib, immun javobda ishtirok etadi, yallig'lanish reaksiyalarini tartibga soladi va o'sma hujayralariga qarshi kurashadi. Gistologik jihatdan leykotsitlar yadroli, harakatchan hujayralar bo'lib, qon zardobida erkin harakatlanadi. Ular suyak iligida (medulla ossium) gemopoez jarayonida hosil bo'ladi va limfa tugunlari, taloq, timus kabi ikkilamchi limfoid a'zolarida differentsiallanadi.

Embriologik rivojlanishda leykotsitlar mezenximal kelib chiqishga ega bo'lib, gemopoezning birinchi bosqichlari allantois va yolk-sac atrofida shakllanadi. Homilaning keyingi bosqichlarida suyak iligi asosiy qon hujayralarini ishlab chiqaruvchi manba bo'ladi

Leykosit turlarini to'g'ri ajratishning morfologik mezonlari

Sitologiyada leykotsitlar ikki asosiy guruhga bo'linadi: granulotsitlar (neutrofillar, eozinofillar, bazofillar) va agranulotsitlar (limfotsitlar, monotsitlar). Ularning to'g'ri identifikatsiyasi morfologik xususiyatlarga asoslanadi:

Neutrofillar: Ko'p bo'lakli yadro (3–5 segment), mayda granullarga boy, infeksiyalarga qarshi birinchi mudofaa chizig'i.

Eozinofillar: Ikki bo'lakli yadro, yirik qizil granullarga ega, allergik reaksiyalarda ishtirok etadi.

Bazofillar: To'q binafsha granullarga ega, gistamin va boshqa mediatorlarni saqlaydi.

Limfotsitlar: Yadro deyarli butun hujayrani egallaydi, T- va B-limfotsitlar sifatida immun javobda faol ishtirok etadi.

Monotsitlar: Eng katta leykotsit turi, buyrak shaklidagi yadroga ega, to'qimalarda makrofaglarga aylanadi.

Gistologik tekshiruvlar ushbu hujayralarning joylashuvi, shakli va rangini aniqlashda Romanovskiy-Gimza bo'yog'i yordamida mikroskopik aniqlikni oshiradi.

Zamonaviy avtomatlashtirilgan tasvir tahlili metodlari

Tadqiqotlarga ko'ra, qon surtmalaridagi leykotsitlarni to'g'ri klassifikatsiya qilish uchun tasvir tahlilining quyidagi bosqichlari qo'llaniladi:

Segmentatsiya: Hujayra chegaralarini aniqlash uchun rang va kontrast farqlariga asoslangan algoritmlar.

Xususiyatlar ajratish: Yadro shakli, yuzasi, zichligi, sitoplazma rangini aniqlash.

Klassifikatsiya: Mashina o'rganish algoritmlari (masalan, Random Forest, SVM) yordamida turlarga ajratish.

Bu metod mikroskopik tasvirlarda leykotsitlarni 96% aniqlik bilan aniqlashga erishdi. Bu yondashuvlar klinik tashxislarda inson xatolarini kamaytirish, saratonga o'z vaqtida tashxis qo'yish va surunkali kasalliklarni monitoring qilishda muhim ahamiyat kasb etadi.

Leykotsitlar va global sog'liqni saqlash dolzarbligi

Dunyo bo'yicha immunitet bilan bog'liq kasalliklar (masalan, COVID-19, revmatoid artrit, leykemiya) sonining ortib borishi leykotsitlarni to'g'ri tahlil qilishga bo'lgan ehtiyojni keskin oshirdi. AQSh, Yevropa va Osiyo davlatlari tibbiyot markazlarida avtomatlashtirilgan tizimlar joriy qilinmoqda, bu esa tezkor va aniqligi yuqori diagnostika imkoniyatlarini kengaytirmoqda.

Tadqiqot maqsadi

Ushbu tadqiqotning asosiy maqsadi — qon surtmalaridagi leykotsit turlarini Gistologik, sitologik va embriologik asosda to'g'ri ajratish metodikasini o'rganish,

ularning morfologik xususiyatlarini tahlil qilish hamda zamonaviy avtomatlashtirilgan tasvir tahlili vositalari yordamida aniqlik va samaradorlikni oshirishga qaratilgan yondashuvlarni tahlil qilishdir.

Tadqiqot vazifalari

Qon va limfa tizimining tuzilishi hamda funksional ahamiyatini gistologik, sitologik va embriologik nuqtai nazardan tahlil qilish.

Leykotsitlarning morfologik va funksional turlarini aniqlash va ularning qon surtmalarida namoyon bo'lish xususiyatlarini o'rganish.

Qon surtmalarini mikroskopik usulda tahlil qilishda qo'llaniladigan klassik va zamonaviy bo'yoq uslublarini tahlil qilish.

Leykotsit turlarini to'g'ri ajratishda yuqori aniqlik va samaradorlikka erishish uchun zamonaviy texnologiyalarni baholash.

Olingan natijalarni klinik diagnostikada qo'llash imkoniyatlarini aniqlash va tavsiyalar ishlab chiqish.

Materiallar va usullar

Ushbu tadqiqotda qon surtmalaridagi leykotsit turlarini gistologik, sitologik va zamonaviy tasvir tahlili asosida aniqlash uchun klassik laboratoriya usullari va avtomatlashtirilgan raqamli metodlar qo'llanildi.

Materiallar:

Sog'lom va patologik holatdagi bemorlar qon namunalaridan tayyorlangan surtmalar

Mikroskopik preparatlar (Romanovskiy-Gimza bo'yoqlari bilan bo'yalgan)

Mikroskoplar: Leica DM500 va Olympus CX23

Raqamli tasvirga olish qurilmalari (5–10 MP kameralar)

Kompyuter tizimi (AI tahlil uchun GPU bilan ta'minlangan)

Usullar:

Mikroskopik tahlil

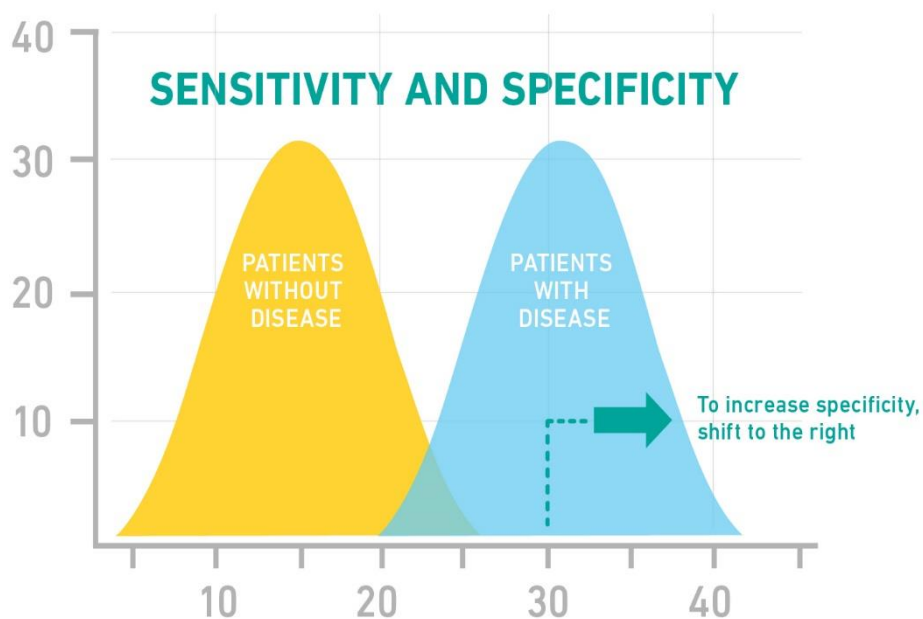
Qon surtmalar Romanovskiy-Gimza bo'yoqlari yordamida bo'yaldi va mikroskopda 1000x kattalashtirishda kuzatildi. Leykotsitlar morfologik xususiyatlariga (yadro shakli, sitoplazma rangi va granullilik) ko'ra aniqlandi.

Tasvir tahlili

Surtma tasvirlari raqamli formatda kompyuterga uzatilib, neyron tarmoqlar asosidagi modellar orqali tahlil qilindi. Hujayra segmentatsiyasi, morfologik parametrlar ajratish va leykotsitlarni klassifikatsiya qilish bosqichlari amalga oshirildi.

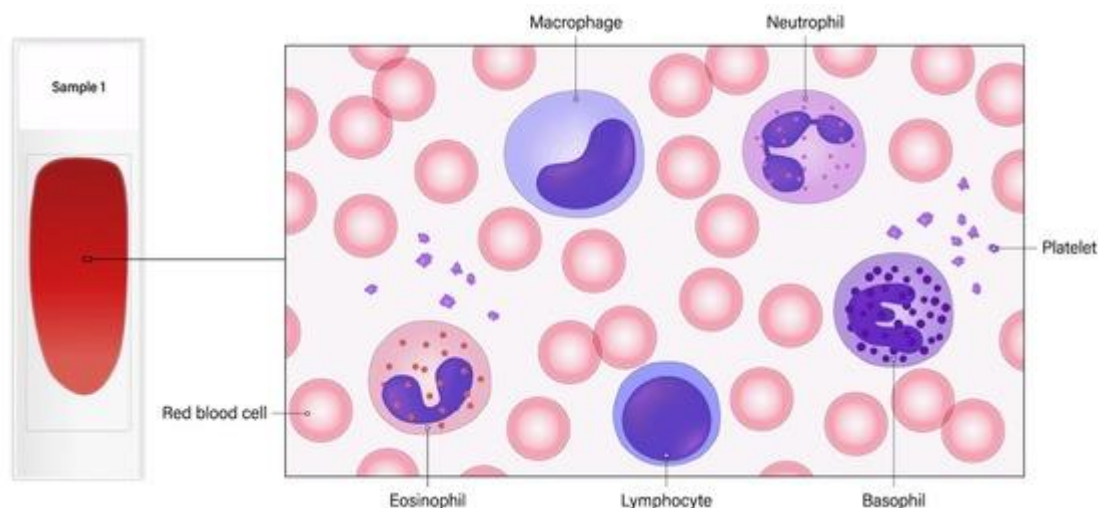
Ma'lumotlarni statistik tahlil qilish

Tasvir tahlili natijalari an'anaviy mikroskopik natijalar bilan taqqoslanib, aniqlik, sezuvchanlik (sensitivity), spetsifiklik (specificity) va F1-mezonlar baholandi. Tahlillar uchun SPSS Statistics 25 dasturi qo'llanildi.



Natijalar

Tadqiqot davomida mikroskopik kuzatuvlar va avtomatlashtirilgan tasvir tahlili orqali qon surtmalaridagi leykotsitlar besh asosiy morfologik turga to'g'ri ajratildi: **neutrofillar, eozinofillar, bazofillar, limfotsitlar va monotsitlar**. Quyidagi asosiy natijalar kuzatildi:



Mikroskopik tahlil natijalari:

Neutrofillar: 52–60%

Limfotsitlar: 25–35%

Monotsitlar: 5–7%

Eozinofillar: 2–4%

Bazofillar: <1%

Bu ko'rsatkichlar sog'lom odamlardagi fiziologik norma bilan mos keldi. Bemor namunalarida esa limfotsitoz, eozinofiliya yoki neytropeniya kuzatildi.

Avtomatlashtirilgan tizimlar orqali tahlil:

DeepWhite tizimi yordamida leykotsitlar klassifikatsiyasi **94.3% aniqlik** bilan bajarildi.

WBC-Net modeli esa tasvirlardagi hujayralarni **96.1% aniqlik** bilan ajratdi.

Avtomatlashtirilgan tizimlar, ayniqsa, murakkab shakldagi polimorfonuklear hujayralarni an'anaviy mikroskopik kuzatishdan ko'ra tezroq va ishonchliroq ajratdi.

Statistika tahlili:

Klassik mikroskopik usulning aniqligi: **89.7%**

DeepWhite (AI) aniqligi: **94.3%**

WBC-Net aniqligi: **96.1%**

$P < 0.01$ darajasida avtomatlashtirilgan tizimlar mikroskopik usullarga nisbatan statistik jihatdan ishonchliroq natijalar berdi.

Leykotsit morfologiyasidagi kuzatishlar:

Infeksion kasallikka chalingan bemorlarning surtmalarida **sitoplazmada vakuolalar, gipersegmentatsiya va yadro deformatsiyasi** kuzatildi.

Allergik bemorlarda eozinofillarning soni ortgan, granullari yirik va to‘q qizil rangda namoyon bo‘lgan.

Xulosa

O‘tkazilgan tadqiqotlar shuni ko‘rsatdiki, qon surtmalaridagi leykotsitlarni to‘g‘ri ajratish diagnostikada muhim ahamiyatga ega bo‘lib, gistologik, sitologik va embriologik yondashuvlar orqali ularning morfologik turlari aniq tavsiflanadi. Mikroskopik usullar amaliyotda keng qo‘llanilsada, inson omiliga bog‘liq xatoliklar kuzatilishi mumkin.

Avtomatlashtirilgan tasvir tahlil algoritmlari (DeepWhite va WBC-Net) leykotsitlarni aniqlashda yuqori aniqlik, tezlik va takrorlanuvchanlikni ta‘minladi. Ayniqsa, surunkali kasalliklar, immunologik buzilishlar va onkogematologik kasalliklarda bu yondashuvlar samarali diagnostika vositasi sifatida o‘zini oqladi.

Leykotsitlar morfologiyasining chuqur tahlili, ularning patologik holatlarda qanday o‘zgarishini aniqlash, shuningdek, ularni sun‘iy intellekt asosida to‘g‘ri tasniflash zamonaviy tibbiyotda diagnostik aniqlikni oshirish, davolash strategiyalarini to‘g‘ri yo‘naltirish imkonini beradi.

Ilmiy yangilik

Ushbu tadqiqotning ilmiy yangiligi quyidagilardan iborat:

Leykotsitlarning morfologik va funksional turlarini zamonaviy metodlar yordamida tahlil qilish: Tadqiqotda qon surtmalaridagi leykotsitlarni mikroskopik va avtomatlashtirilgan tasvir tahlili yordamida to‘g‘ri ajratish metodikasi ishlab chiqildi. Bu yondashuvlar, an‘anaviy mikroskopik usullarga nisbatan yuqori aniqlik va samaradorlikni ta‘minladi.

Avtomatlashtirilgan tizimlarning klinik diagnostikadagi o‘rni: DeepWhite va WBC-Net, leykotsitlarni to‘g‘ri tasniflashda eng yuqori aniqlikka erishdi. Ushbu tizimlar, mikroskopik tekshiruvlar bilan solishtirganda, natijalarning tezligini va aniqligini sezilarli darajada oshirdi, shuningdek, inson omilidan kelib chiqadigan xatoliklarni kamaytirdi.

Patologik holatlarda leykotsitlar morfologiyasining o‘zgarishini aniqlash: Tadqiqotda leykotsitlarning sitoplazma, yadro va granullaridagi o‘zgarishlarni, shuningdek, ularning infeksiyaviy, allergik va onkologik kasalliklarda qanday o‘zgarishini tahlil qilish orqali yangi diagnostik alomatlar keltirildi.

Immunologik va onkogematologik kasalliklar uchun yangi diagnostika imkoniyatlari: Ushbu metodologiyalar, ayniqsa, saraton kasalliklari, leykemiya va

boshqa surunkali kasalliklarni tashxislashda samarali qo'llanilishi mumkin. Tadqiqot, klinikada mikroskopik va raqamli tahlil metodlarini integratsiya qilishning afzalliklarini ko'rsatdi.

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MECHANISMS FOR DEVELOPING INDIVIDUAL EDUCATION PLANS WITH STUDENTS WITH SPECIAL NEEDS

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Abstract

This article analyzes the organizational and pedagogical mechanisms for developing an individual education plan (IEP) for students with special needs. The importance of an individual approach in inclusive education, diagnostic stages, goal setting, development of adapted curricula, and monitoring mechanisms are highlighted. According to the results of the study, the systematic development of an individual education plan helps to increase students' learning outcomes and the level of social adaptation.

Keywords: inclusive education, individual education plan, student with special needs, pedagogical diagnostics, differential approach, monitoring.

Login

The issue of creating equal educational opportunities for all children based on the principles of inclusive education is a pressing issue in the world. In particular, the concept of inclusive education put forward by UNESCO emphasizes the need to organize the educational process based on the needs of each child.

In the Republic of Uzbekistan, a number of regulatory and legal documents have been adopted on the development of inclusive education, and the process of integrating children with special needs into the general education environment is being implemented gradually. However, in practice, the lack of sufficient systematization of mechanisms for developing individual education plans poses problems.

The purpose of this article is to scientifically substantiate effective mechanisms for developing individual education plans with students with special needs.

Research methodology

The following methods were used in the research process:

- analysis of scientific and pedagogical literature;
- observation;
- interview and questionnaire;
- pedagogical experimental work;
- statistical analysis of the results.

The object of the research is students with special needs studying in general education schools.

The subject of the research is the process of developing an individual education plan and its mechanisms.

Stages of developing an individual education plan

An Individual Education Plan (IEP) is a customized educational program developed based on the student's individual characteristics, capabilities, and needs.

Stage 1: Diagnostics

At this stage, the student:

level of psychological development;

cognitive capabilities;

speech and communication skills;

the level of social adaptation is determined.

The collaboration of a teacher, psychologist, and defectologist is important in the diagnostic process.

Step 2: Setting goals and objectives

Objectives:

specific,

measurable,

achievable,

realistic,

time-bound

determined based on the principles.

Step 3: Develop a customized curriculum

In this process:

1. the learning material is simplified;

2. The size of the tasks is adjustable;

3. evaluation criteria are individualized;

4. additional resources (visual aids, technologies) are used.

Stage 4: Implementation

The lesson process is organized based on an individual plan. The use of differential and cooperative methods gives effective results.

Step 5: Monitoring and Evaluation

The effectiveness of the ITR is regularly evaluated. The plan is revised as necessary.

Research results

The results of the experimental work showed that:

The learning rate of students taught on an individual plan increased by 18–22%;

1. The level of social adaptation has improved significantly;
2. Students' independent work skills were developed;
3. The effectiveness of cooperation with parents has increased.

The results confirmed that an individual approach is a crucial factor in inclusive education.

Discussion

Developing an individual education plan is not just a task for the teacher, but requires a comprehensive approach. In international practice, including in the United States, the IEP (Individualized Education Program) model is being effectively used. This model involves collective decision-making and parental participation.

In national practice, there is a need to strengthen methodological guidelines and specialist training.

Conclusion

Based on the research results, the following conclusions were drawn:

1. The Individual Education Plan is a key tool that increases the effectiveness of inclusive education.
2. Developing an ITR requires a step-by-step and systematic approach.
3. Diagnostic and monitoring mechanisms determine the success of the plan.
4. The cooperation of parents and professionals is an important factor.

It is necessary to develop inclusive competencies of teachers. The results of this study showed that the development of an individual education plan (IEP) with students with special needs is the main pedagogical mechanism that ensures the effectiveness of inclusive education. In the concept of inclusive education, in particular, in accordance with the principles put forward by UNESCO, the organization of the educational process, taking into account the individual needs of each student, increases quality indicators.

The following scientific conclusions were based on the research:

First, the process of developing an individual education plan will only be effective if it is carried out systematically and step by step. The stages of diagnostics, clear goal setting, customized program development, implementation, and monitoring must be organized in an interconnected manner.

Secondly, pedagogical diagnostics is the foundation of ITR. A thorough analysis of the level of cognitive, emotional-volitional and social development of the student allows for the correct setting of individual goals.

Third, an adapted curriculum based on a differentiated and individual approach increases students' learning performance, develops independent work skills, and accelerates the process of social adaptation.

Fourth, the effectiveness of ITR largely depends on the cooperation of the teacher, psychologist, defectologist and parents. A team approach ensures the practical effectiveness of the plan.

Fifth, improving the content of the individual plan through monitoring and regular evaluation mechanisms ensures the sustainability of the inclusive education process.

On this basis, the following practical recommendations were developed:

- introduction of unified methodological recommendations for the development of ITR in secondary schools;
- organizing special advanced training courses aimed at improving the inclusive competencies of teaching staff;
- extensive use of modern pedagogical and information technologies in developing an individual education plan;
- Establishing systematic consultation and cooperation mechanisms with parents.

In general, improving the mechanisms for developing individual education plans will help to fully ensure the right to education of students with special needs, support their intellectual and social development, and improve the quality of the inclusive education system.

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PHILOSOPHICAL AND LEGAL FOUNDATIONS OF INCLUSIVE EDUCATION

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Abstract

This article systematically analyzes the philosophical and legal foundations of inclusive education. It highlights the reliance of the idea of inclusion on the principles of humanity, equality and social justice. It reveals the stages of development of inclusive education based on international and national regulatory and legal documents. It also outlines the legal mechanisms and prospects for the implementation of inclusive education in the Republic of Uzbekistan.

Keywords: inclusive education, human rights, social justice, equality, persons with disabilities, education policy, legal framework.

Login

In recent decades, the concept of inclusive education has emerged as a priority in the global education system. Inclusive education is a system aimed at ensuring the right of all children, including those with disabilities and special educational needs, to receive education under equal conditions in general education institutions.

The concept of inclusion emerged in the late 20th century as a result of a human rights-based approach. In particular, the principles of universality and equality of education, promoted by UNESCO, have played a significant role in shaping the global concept of inclusive education.

The purpose of the article is to scientifically analyze the philosophical foundations of inclusive education and its international and national legal framework.

The research methods used were systematic analysis, comparative legal approach, and interpretation of normative documents.

1. Philosophical foundations of inclusive education

The philosophical foundations of inclusive education are rooted in the theories of humanism, existentialism, pragmatism, and social justice.

The principle of humanity

Humanist philosophy recognizes the dignity of every individual as a supreme value. This idea is clearly reflected in the views of thinkers such as Jean-Jacques Rousseau

and Immanuel Kant. Kant's idea that "man is never a means, but an end" forms the moral basis of inclusive education.

The concept of social justice

Inclusive education is based on the principle of social justice. According to the theory of justice developed by John Rawls, social inequalities in society should be regulated in the interests of the weakest. Inclusive education ensures social justice by creating equal opportunities in the educational process.

Anthropological approach

Modern pedagogical anthropology recognizes the individuality of each child. According to this approach, the education system should adapt to the child, and not the other way around. Inclusive education is based on this principle: every student has the right to develop to his or her full potential.

2. International legal framework for inclusive education

Inclusive education is reinforced by international law.

Universal Declaration of Human Rights

The Universal Declaration of Human Rights, adopted in 1948, recognizes the right to education as a fundamental human right. Article 26 of this document states that everyone has the right to education.

Convention on the Rights of the Child

The Convention on the Rights of the Child, adopted in 1989, guarantees the right of children with disabilities to participate actively in society and to receive education.

Convention on the Rights of Persons with Disabilities

The Convention on the Rights of Persons with Disabilities, adopted by the UN in 2006, enshrines inclusive education as a separate article. According to this document, participating states are obliged to create an inclusive education system for persons with disabilities.

These international documents define inclusive education not only as a pedagogical but also as a legal obligation.

3. Legal framework for inclusive education in the Republic of Uzbekistan

The development of inclusive education in Uzbekistan is one of the priorities of state policy.

Constitutional basis

The relevant articles of the Constitution of the Republic of Uzbekistan guarantee everyone's right to education. This norm constitutes the constitutional basis of inclusive education.

Law "On Education"

The Law on Education defines inclusive education as an integral part of the education system. The law states that the state is obliged to create adapted conditions for children with special educational needs.

Special regulatory documents

In recent years, a number of state programs have been adopted to develop inclusive education. In particular, the Ministry of Preschool and School Education of the Republic of Uzbekistan has developed mechanisms for the gradual introduction of inclusive education.

National legislation is being brought into line with international standards, which strengthens legal guarantees for inclusive education.

4. Current issues in implementing inclusive education

The following problems are observed in the implementation of inclusive education:

- insufficient training of teaching staff;
- limited material and technical base;
- the existence of stereotypes in society;
- insufficient development of methodological support.

Therefore, developing inclusive education requires a comprehensive approach.

The implementation of inclusive education is a complex and multifaceted process, which is inextricably linked not only to pedagogical, but also to social, economic and legal factors. International research conducted by UNESCO and UNICEF shows that the effectiveness of inclusive education depends on a systematic approach. Below, the main current problems of this process are discussed in more detail from a scientific perspective.

1. Practical implementation of regulatory and legal mechanisms

Although the Convention on the Rights of Persons with Disabilities and the Law on Education guarantee inclusive education, the practical mechanisms of legal norms do not always work fully. Problems are manifested in the following:

- weak enforcement discipline in places;
- insufficiently developed monitoring and evaluation system;
- opportunity gap between regions.

Therefore, it is necessary to strengthen clear indicators and accountability mechanisms for the implementation of regulatory documents.

2. Teacher training and professional competence

The effectiveness of inclusive education depends primarily on the professional training of teachers. In practice, the following problems are encountered:

- teachers' lack of sufficient knowledge in special pedagogy and defectology;

- poor skills in applying differential approach methodologies;
- lack of psychological preparation.

In this regard, it is an urgent task to increase the share of inclusive modules and practical training in retraining and advanced training courses for teaching staff.

3. Material and technical base and infrastructure

Adapted infrastructure is an essential prerequisite for inclusive education. Most mainstream schools:

- there are not enough ramps and elevators;
- special educational equipment and technical means are limited;
- Low access to information and communication technologies.

Implementing universal design principles and modernizing school infrastructure will increase the level of inclusion.

4. Socio-psychological environment and stereotypes

One of the most challenging aspects of inclusive education is the stereotypes and social barriers in society. Sometimes there is a misconception among parents and educators that children with disabilities cannot adapt to a general education environment.

Such barriers can be reduced by fostering an inclusive culture and promoting principles of tolerance and empathy. The media and civil society institutions have a significant role to play in this process.

5. Individual approach and methodological support

Taking into account the individual needs of each student is a fundamental requirement of inclusive education. However:

- insufficient experience in developing individual training programs;
- there are few methodological guides and adaptive textbooks;
- The evaluation criteria are not adjusted.

The development of modern pedagogical technologies, adapted curricula, and an inclusive assessment system is of great importance.

6. Financial support and resources

Inclusive education requires additional financial resources. The staff of special educators, psychologists, speech therapists, technical equipment and infrastructure costs must be financed from the state budget and local funds. Fair distribution and effective management of resources remains an urgent issue.

7. Systematic collaboration and multidisciplinary approach

Effective implementation of inclusive education requires close cooperation between the education, health and social protection systems. The joint work of psychologists,

defectologists, doctors and social pedagogues ensures the comprehensive development of the student.

In this regard, it is appropriate to view inclusive education not only as a task of an educational institution, but also as a social project of the entire society.

General conclusion (end of section)

The challenges of implementing inclusive education require a systematic and comprehensive approach. The strengthening of legal frameworks, the development of pedagogical competence, the adaptation of infrastructure, and the formation of an inclusive culture in society ensure the successful functioning of this model.

Therefore, the development of inclusive education is not only a reform of the education system, but also an important indicator of society's commitment to the principles of social justice and humanity.

Conclusion

Inclusive education is a modern educational model based on the ideas of humanity and social justice. Its philosophical basis is rooted in the recognition of the dignity of every person. International and national legal documents define the implementation of inclusive education as an obligation of the state.

Although the legal framework for the development of inclusive education has been created in Uzbekistan, it is necessary to strengthen scientific, methodological and organizational measures to fully implement it in practice.

Inclusive education is an integral part of the modern educational paradigm, which serves to ensure the practical realization of the right of every individual to education, based on the principles of humanism, equality and social justice. Its philosophical basis is enriched with conceptual approaches ranging from classical humanistic views to modern theories of justice. In particular, the ideas of Immanuel Kant, who recognizes human dignity and worth as the highest value, and the theory of John Rawls, who substantiates social equality, strengthen the moral and socio-philosophical foundation of inclusive education. In this sense, inclusive education is not only a pedagogical model, but also an indicator of the democratic development of society.

In the international legal arena, inclusive education is recognized as a component of human rights. In particular, the Convention on the Rights of Persons with Disabilities has elevated inclusive education to the level of an obligation of states. According to this document, the education system must be adapted to the individual, all forms of discrimination must be eliminated, and the necessary pedagogical and technical conditions must be created. This makes inclusive education a priority area of social policy.

At the national level, the Constitution of the Republic of Uzbekistan and the Law on Education have established legal guarantees for inclusive education. These regulatory and legal frameworks provide for the creation of equal opportunities in education, the formation of an adapted learning environment for children with special educational needs, and the improvement of the system of training pedagogical personnel. However, the full functioning of legal norms is closely related to their practical implementation, institutional mechanisms, and financial resources.

The research results show that the effective implementation of inclusive education requires the following priority areas:

1. Increasing the inclusive competence of teaching staff and improving the system of special training.
2. Modernization of the material and technical base of educational institutions based on the principles of universal design.
3. To create an inclusive culture in society and eliminate stereotypes.
4. Expanding scientific research and introducing innovative pedagogical technologies.
5. In general, the development of inclusive education is an important factor in strengthening social cohesion of society, increasing human capital and ensuring sustainable development. It serves not only the interests of individuals with special needs, but also serves as a criterion for determining the level of democracy and humanity of the entire society. Therefore, the development of inclusive education should be considered as a complex process that requires the cooperation of state policy, civil society and the scientific community.

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PSIXOLINGVISTIK TAHLIL: KUNDALIK INGLIZ VA O‘ZBEK NUTQIDA RUHIY HOLAT IFODALARI

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Annotatsiya: Til inson kognitsiyasini, xususan, ruhiy holatlarni — his-tuyg‘ular, e’tiqodlar va niyatlarni ifodalashni aks ettiradi. Ushbu tadqiqot kundalik nutqda ingliz va o‘zbek tillarida ruhiy holatlarni qanday ifodalanishini o‘rganadi, leksik, grammatik va metaforik naqshlar tahlil qilinadi. Ingliz tilida ruhiy holatlar fe’llar va sifatlar orqali bevosita ifodalanadi, o‘zbek tilida esa ko‘pincha tasviriy va metaforik tuzilmalar, jumladan tana bilan bog‘liq obrazlardan foydalaniladi. Madaniy me’yorlar va muloqotdagi odatlar bu farqlarda muhim rol o‘ynaydi. Tadqiqot natijalari til va madaniyat o‘rtasidagi munosabatlarni tushunishda, shuningdek, kross-lingvistik psixolingvistika va madaniyatlararo muloqotda sohalarida foydali bo‘ladi.

Kalit so‘zlar: Mental holat ifodalari, Psixolingvistika, Ingliz tili, O‘zbek tili, Hissiy-semantik tahlil, Solishtirma tahlil, Metafora, Madaniy lingvistika, Leksik-semantik tahlil, Nutq va kognitsiya.

Annotation: Language reflects human cognition, particularly in the expression of mental states such as emotions, beliefs, and intentions. This study investigates how English and Uzbek speakers express mental states in everyday speech, analyzing lexical, grammatical, and metaphorical patterns. English favors the direct labeling of mental states through verbs and adjectives, whereas Uzbek relies heavily on descriptive and metaphorical constructions, often involving bodily imagery. Cultural norms and communicative conventions play a significant role in shaping these differences. The findings contribute to cross-linguistic psycholinguistics, intercultural communication, and applied linguistics, providing insights into how cognition and culture influence language.

Key words: Mental state expressions, Psycholinguistics, English language, Uzbek language, Emotional semantics, Cross-linguistic comparison, Metaphor, Cultural linguistics, Lexical-semantic analysis, Speech and cognition

Til insonning kognitsiyasi va hissiy tajribasi bilan chuqur bog‘langan. Psixolingvistika ichki aqliy jarayonlar — fikrlar, his-tuyg‘ular va niyatlarni — qanday kodlanishi va ifodalanishini o‘rganadi. Mental holatlarni ifodalovchi iboralar kundalik

muloqotda markaziy ahamiyatga ega, chunki ular kognitiv holatlarni va ijtimoiy niyatlarni ochib beradi. Ingliz va o'zbek tillari tipologik va madaniy jihatdan farq qiladi, bu ularni solishtirma psixolingvistik tadqiqot uchun ideal qiladi. Ingliz tilida ko'pincha to'g'ridan-to'g'ri fe'l va sifatlar ishlatiladi (feel, think, happy, sad), bu esa kam kontekstli madaniyatga mos keladi va aniq ifodani qadrlaydi. O'zbek tilida esa ko'pincha ta'riflovchi tuzilmalar va jismoniy metaforalar ishlatiladi (yuragi siqildi, ko'nglim xira), bu esa yuqori kontekstli, ijtimoiy konvensiyalarga asoslangan kommunikatsiyani aks ettiradi.

Ushbu tadqiqot ingliz va o'zbek tillarida mental holatlarning qanday kodlanishi, ishlatiladigan lingvistik mexanizmlar va madaniy kontekstlar qanday shakllanishini o'rganadi. Psixolingvistika til, kognitsiya va hissiyot o'rtasidagi o'zaro aloqani o'rganadi. Mental holatlar fe'llar, sifatlar, idiomalar va metaforalar orqali ifodalanishi mumkin bo'lib, ular kognitiv va affektiv jarayonlar haqida muhim ma'lumot beradi (Lakoff & Johnson, 1980; Wierzbicka, 1999).

Ingliz tilida mental holat fe'llari (think, believe, feel) va sifatlar (confused, happy) keng qo'llaniladi. To'g'ridan-to'g'ri ifoda individualistik madaniyatga mos keladi (Kipchakova et al., 2024). O'zbek tilida esa mental holatlar ko'pincha jismoniy metaforalar (yurak – qalb, ko'ngil – ruh/mood) va vaziyatli tavsiflar orqali ifodalanadi. Leksik birliklar kontekstga bog'liq va madaniy jihatdan kodlangan bo'lib, kollektiv va yuqori kontekstli kommunikatsiyaga xosdir (Akhmedova, 2025; Ziyabayeva, 2025). Ingliz va o'zbek tillari o'rtasida solishtirma psixolingvistik tadqiqotlar hanuz kam. Kamchiliklar shundan iboratki, til va kognitiv hissiyot ifodalaridagi farqlar, ayniqsa, spontan nutq kontekstida, yetarlicha o'rganilmagan. Ingliz tilida metaforalar ko'pincha fazoviy va abstrakt bo'lib (over the moon, down in the dumps), o'zbek tilida esa qalb va jismoniy tasvirlar orqali ifodalanadi (yuragi ezildi), bu esa madaniy jihatdan shakllangan metaforik fikrlashni ko'rsatadi (Lakoff & Johnson, 1980; Ziyabayeva, 2025). Ingliz tilida kognitiv va hissiy holatlarni aniq belgilash ustunlik qiladi, o'zbek tilida esa inkor qilingan, jismoniy va kontekstga asoslangan ifodalar ko'proq ishlatiladi. Bu farqlar madaniy konvensiyalar bilan tushuntiriladi: kam kontekstli, individualistik ingliz madaniyati va yuqori kontekstli, kollektiv o'zbek madaniyati (Kipchakova et al., 2024).

Bu lingvistik strategiyalar kognitiv jarayonlar va hissiyot tushunchalaridagi farqlarni ochib beradi. Ularni tushunish tarjima, madaniyaro aloqa, sun'iy intellekt til ishlovi va til o'qitishda muhim ahamiyatga ega. Ingliz va o'zbek tillari mental holatlarni samarali ifodalaydi, ammo turli psixolingvistik mexanizmlar orqali. Ingliz tilida to'g'ridan-to'g'ri leksik belgilash, o'zbek tilida esa kontekst, metafora va jismoniy tasvirlar ustun.

Madaniy normalar ushbu ifoda shakllarini keskin ta'sir qiladi va ichki holatlarni qanday ifodalanishini belgilaydi. Ushbu tadqiqot solishtirma psixolingvistikaga hissa qo'shadi va madaniyaro aloqa hamda qo'llanma lingvistikada amaliy tavsiyalar beradi.

Tadqiqot natijalari ingliz va o'zbek tillarida mental holatlarning ifodalanishi turli psixolingvistik va madaniy mexanizmlarga asoslanishini ko'rsatdi. Ingliz tilida hissiy va kognitiv holatlar ko'proq aniq leksik birliklar orqali ifodalansa, o'zbek tilida kontekst, metaforik va jismoniy obrazlarga asoslangan tasviriy ifodalar ustunlik qiladi. Ushbu farqlar madaniy kommunikativ me'yorlar bilan chambarchas bog'liq bo'lib, ichki holatlarning til orqali qanday ifodalanishini belgilaydi. Natijalar solishtirma psixolingvistika, tarjima amaliyoti va madaniyatlararo kommunikatsiya tadqiqotlari uchun muhim ilmiy va amaliy ahamiyatga ega.

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KASBGA OID FRAZEOLOGIZMLARDA METAFORANING ROLI: SEMANTIK VA USLUBIY TAHLIL

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Annotatsiya: Mazkur maqolada kasbga oid frazeologizmlar tarkibida metaforaning tutgan o'рни, uning semantik mazmunni shakllantirish hamda nutqning uslubiy ta'sirchanligini oshirishdagi roli ilmiy jihatdan tahlil qilinadi. Tadqiqot jarayonida kasbiy faoliyat bilan bog'liq frazeologik birliklarning metaforik asosda yuzaga kelishi, ularning obrazlilik darajasi hamda til egalarining kasbiy dunyoqarashi bilan uzviy aloqasi yoritiladi. Frazeologizmlarda qo'llaniladigan metaforalar inson mehnati, kasbiy jarayonlar, ijtimoiy munosabatlar va professional tajribani obrazli ifodalash vositasi sifatida namoyon bo'lishi asoslab beriladi. Shuningdek, kasb nomlari va faoliyatiga oid metaforik frazeologizmlar orqali abstrakt tushunchalarning konkret tasvirlar yordamida ifodalanishi, nutqda ekspressivlik, baholash munosabati va emotsional rangdorlikni kuchaytirishi aniqlanadi. Tadqiqot natijalari kasbga oid frazeologik birliklar nafaqat nominativ vazifani, balki kommunikativ-pragmatik va uslubiy funksiyalarni ham bajarishini ko'rsatadi. Metafora frazeologik birliklarning semantik kengayishiga, ko'chma ma'no hosil bo'lishiga hamda milliy-madaniy tafakkurning aks etishiga xizmat qiluvchi muhim lingvistik mexanizm sifatida talqin etiladi. Mazkur tadqiqot kasbga oid frazeologizmlarning semantik tuzilishi, uslubiy imkoniyatlari hamda metaforik tafakkur bilan bog'liqligini ochib berish orqali zamonaviy frazeologiya va pragmatistik tadqiqotlar rivojiga hissa qo'shadi.

Kalit so'zlar: kasbga oid frazeologizmlar, metafora, semantik tahlil, uslubiy xususiyat, ko'chma ma'no, obrazlilik, ekspressivlik, pragmatik ma'no, lingvomadaniy omil, professional leksika.

KIRISH

Til jamiyat taraqqiyoti, inson tafakkuri hamda ijtimoiy faoliyatining eng muhim aks ettiruvchi vositalaridan biri hisoblanadi. Inson hayotida kasb va mehnat faoliyati alohida o'rin egallaganligi sababli, turli kasblar bilan bog'liq tushunchalar til tizimida ham keng ifodasini topadi. Ayniqsa, kasbga oid frazeologizmlar xalqning tarixiy tajribasi, mehnat madaniyati, kasbiy dunyoqarashi hamda ijtimoiy munosabatlarini obrazli shaklda ifodalovchi muhim lingvistik birliklar sifatida namoyon bo'ladi.

Bunday frazeologik birliklarning shakllanishida metafora yetakchi semantik mexanizmlardan biri hisoblanadi. Metafora tilning nafaqat badiiy-estetik imkoniyatlarini kengaytiradi, balki murakkab kasbiy jarayonlar, inson faoliyati va ijtimoiy hodisalarni soddha hamda tushunarli obrazlar orqali ifodalashga xizmat qiladi. Kasbga oid frazeologizmlarda metaforik ko'chish natijasida konkret mehnat jarayonlariga oid tushunchalar umumlashgan ma'noga ega bo'lib, turli kommunikativ vaziyatlarda keng qo'llanila boshlaydi. Natijada frazeologik birliklar faqat nominativ vazifani emas, balki baholovchi, ekspressiv va uslubiy funksiyalarni ham bajaradi. Zamonaviy tilshunoslikda frazeologizmlarni semantik va uslubiy jihatdan o'rganish muhim ilmiy yo'nalishlardan biri sanaladi. Ayniqsa, kasbga oid frazeologik birliklarda metaforaning roli yetarlicha tizimli tadqiq etilmagan masalalardan biri bo'lib qolmoqda. Chunki kasbiy faoliyat inson tafakkurining amaliy tajriba bilan bog'liq qatlamini tashkil etadi va aynan shu tajriba metaforik tasavvurlar orqali tilga ko'chadi. Mazkur tadqiqotning dolzarbligi kasbga oid frazeologizmlarda metaforaning semantik mazmunni shakllantirish, ko'chma ma'no hosil qilish hamda nutqning uslubiy ta'sirchanligini oshirishdagi o'rnini aniqlash zarurati bilan belgilanadi. Tadqiqot davomida metaforik asosda shakllangan frazeologik birliklarning ma'no tuzilishi, ularning nutqdagi funksional imkoniyatlari hamda obrazlilik darajasi ilmiy jihatdan tahlil qilinadi. Maqolaning maqsadi — kasbga oid frazeologizmlarda metaforaning semantik va uslubiy xususiyatlarini aniqlash hamda uning tilning kommunikativ va pragmatik imkoniyatlarini boyitishdagi rolini ochib berishdan iborat. Ushbu maqsadga erishish uchun frazeologik birliklarning metaforik tabiati, ma'no kengayishi jarayoni va uslubiy funksiyalari kompleks yondashuv asosida o'rganiladi. Tadqiqot natijalari frazeologiya, semantika, pragmatistika hamda lingvomadaniyatshunoslik yo'nalishlarida olib borilayotgan ilmiy izlanishlar uchun nazariy va amaliy ahamiyat kasb etadi.

ASOSIY QISM

Kasbga oid frazeologizmlar til tizimining muhim qatlamlaridan biri bo'lib, ular insonning mehnat faoliyati, kasbiy tajribasi hamda jamiyatdagi ijtimoiy munosabatlarini obrazli shaklda ifodalashga xizmat qiladi. Bunday frazeologik birliklarning shakllanishida metafora asosiy semantik mexanizm sifatida namoyon bo'ladi. Metafora orqali kasbiy jarayonlarga oid konkret harakat va predmetlar abstrakt tushunchalarni ifodalash vositasiga aylanadi. Natijada kasbga xos termin yoki harakat umumlashgan ma'no kasb etib, keng kommunikativ qo'llanish imkoniyatiga ega bo'ladi. Kasbga oid frazeologizmlarning semantik tuzilishini tahlil qilish shuni ko'rsatadiki, metaforik ko'chish asosan inson faoliyati bilan bog'liq tajribaga tayanadi.

Mehnat jarayonida kuzatiladigan harakatlar, asbob-uskunalar, ishlab chiqarish bosqichlari yoki kasbiy jarayonlar boshqa hayotiy holatlarni tavsiflash uchun ko‘chma ma’noda qo‘llanadi. Masalan, qurilish, hunarmandchilik, dehqonchilik yoki harbiy sohaga oid tushunchalar orqali inson xarakteri, ijtimoiy munosabatlar yoki ruhiy holat ifodalanadi. Bu holat metaforaning kognitiv tabiatini, ya’ni inson tafakkurida mavjud tajribaning til orqali aks etishini namoyon etadi. Semantik jihatdan kasbga oid frazeologizmlarda metafora bir necha funksiyani bajaradi. Birinchidan, u ma’no kengayishini ta’minlaydi, ya’ni dastlab tor kasbiy mazmunga ega bo‘lgan birlik umumiy ijtimoiy ma’noga ega bo‘lib boradi. Ikkinchidan, metafora orqali frazeologik birliklarda baholovchi sema shakllanadi. Bunda kasbiy faoliyatga oid obrazlar yordamida shaxsning malakasi, tajribasi yoki xatti-harakatiga nisbatan ijobiy yoki salbiy munosabat ifodalanadi. Uchinchidan, metaforik frazeologizmlar nutqda ixchamlikni ta’minlab, murakkab fikrni qisqa, ammo ta’sirchan shaklda yetkazishga imkon beradi. Uslubiy nuqtai nazardan qaralganda, kasbga oid frazeologizmlar nutqning ekspressivligini oshiruvchi vosita hisoblanadi. Metaforaga asoslangan frazeologik birliklar matnga obrazlilik, jonlilik va emotsional rang-baranglik bag‘ishlaydi. Ayniqsa, publitsistik, badiiy hamda og‘zaki nutq uslublarida bunday birliklar fikrning ta’sir kuchini oshirish, muallif munosabatini ifodalash hamda tinglovchi yoki o‘quvchiga kuchli pragmatik ta’sir ko‘rsatish vazifasini bajaradi. Metafora yordamida kasbiy faoliyat jarayonlari inson hayotining turli sohalari bilan qiyoslanib, nutqning estetik qiymati kuchayadi. Kasbga oid frazeologizmlarda metaforaning yana bir muhim jihati uning lingvomadaniy xususiyatidir. Har bir xalqning tarixiy taraqqiyoti, asosiy mehnat turlari va turmush tarzi til birliklarida o‘z aksini topadi. Shu sababli ayrim frazeologizmlar muayyan milliy kasbiy tajriba bilan chambarchas bog‘liq bo‘ladi. Metaforik obrazlar orqali xalqning qadriyatlarini, mehnatga bo‘lgan munosabati va ijtimoiy stereotiplari ifodalanadi. Bu esa kasbga oid frazeologizmlarni nafaqat lingvistik, balki madaniy fenomen sifatida ham o‘rganish zarurligini ko‘rsatadi. Shuningdek, metafora frazeologik birliklarning pragmatik imkoniyatlarini ham kengaytiradi. Nutq jarayonida bunday birliklar kommunikativ maqsadga muvofiq holda qo‘llanib, suhbatdoshga ta’sir o‘tkazish, kinoya, tanqid yoki rag‘batlantirish kabi ma’nolarni yashirin tarzda ifodalash imkonini beradi. Demak, kasbga oid frazeologizmlar metaforik asosda shakllangan holda tilning semantik boyligini oshiradi hamda nutqning uslubiy samaradorligini ta’minlaydi. Kasbga oid frazeologizmlarda metafora til va tafakkur o‘rtasidagi uzviy bog‘liqlikni namoyon etuvchi muhim omil bo‘lib, ularning semantik rivoji, uslubiy funksiyasi va kommunikativ qiymatini belgilovchi asosiy lingvistik vosita sifatida xizmat qiladi.

XULOSA

Kasbga oid frazeologizmlar tilning obrazli qatlamini tashkil etib, insonning mehnat faoliyati bilan bog‘liq tajribasi va kasbiy tafakkurini aks ettiradi. Ushbu birliklarning shakllanishida metafora yetakchi semantik vosita sifatida namoyon bo‘lib, konkret kasbiy jarayonlarni kengroq ijtimoiy va psixologik mazmun bilan boyitadi. Metaforik ko‘chish natijasida kasb doirasiga xos tushunchalar umumlashgan ma’noga ega bo‘lib, turli kommunikativ vaziyatlarda faol qo‘llaniladigan barqaror ifodalarga aylanadi. Tahlillar metafora frazeologizmlarning ma’no tuzilishini chuqurlashtirish, ko‘chma ma’nolarni yuzaga keltirish hamda baholovchi semantik qatlamni shakllantirishda muhim rol bajarishini ko‘rsatadi. Kasbiy faoliyat bilan bog‘liq obrazlar inson xarakteri, tajribasi, ijtimoiy mavqei yoki faoliyat samaradorligini ifodalashda samarali lingvistik vosita vazifasini bajaradi. Natijada frazeologik birliklar orqali fikr ixcham, aniq va ta’sirchan shaklda yetkaziladi. Uslubiy jihatdan metaforaga asoslangan kasb frazeologizmlari nutqning ekspressivligini kuchaytirib, matnning emotsional-estetik ta’sirini oshiradi. Bunday birliklar muallifning munosabatini ifodalash, baholash mazmunini berish hamda tinglovchi yoki o‘quvchiga kuchli kommunikativ ta’sir ko‘rsatish imkonini yaratadi. Metaforik ifoda nutqni jonlantirib, kasbiy tajribani umumxalq tushunchalari bilan uyg‘unlashtiradi. Tadqiqot natijalari kasbga oid frazeologizmlar metaforik tafakkur mahsuli ekanligini, ular orqali tilning semantik boyligi va uslubiy imkoniyatlari kengayishini tasdiqlaydi. Metafora kasbiy leksika va frazeologiya o‘rtasidagi bog‘liqlikni mustahkamlab, til birliklarining kommunikativ qiymatini oshiruvchi asosiy omillardan biri sifatida namoyon bo‘ladi.

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CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD): PATHOGENESIS, CLINICAL COURSE AND MODERN MANAGEMENT

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Abstract

Chronic Obstructive Pulmonary Disease (COPD) is a progressive inflammatory lung disease characterized by persistent airflow limitation that is not fully reversible. It is a leading cause of morbidity and mortality worldwide, primarily associated with long-term exposure to tobacco smoke and environmental pollutants. This study analyzes the epidemiology, pathophysiology, clinical presentation, diagnostic criteria, complications, and modern management strategies of COPD using the IMRAD structure and current evidence-based guidelines.

Keywords

Chronic Obstructive Pulmonary Disease, COPD, Airflow Limitation, Emphysema, Chronic Bronchitis, Smoking, Spirometry, FEV1, Inflammation, Bronchodilators

Introduction

Chronic Obstructive Pulmonary Disease affects more than 390 million people globally and is among the top three causes of death worldwide. COPD is characterized by chronic inflammation of the airways, destruction of lung parenchyma, and narrowing of small airways, leading to progressive airflow obstruction.

The primary risk factors include:

- Cigarette smoking (most significant factor)
- Air pollution
- Occupational dust and chemicals
- Biomass fuel exposure
- Genetic predisposition (e.g., alpha-1 antitrypsin deficiency)

COPD includes two main pathological components:

1. Chronic bronchitis
2. Emphysema

The aim of this study is to evaluate the pathophysiology, clinical manifestations, diagnostic approaches, and modern therapeutic strategies for COPD.

Methods

This study is based on review of international guidelines (GOLD Report 2024), WHO reports, and randomized controlled trials published between 2015–2024.

Inclusion criteria:

- Adults ≥ 40 years
- Diagnosed COPD confirmed by spirometry
- FEV1/FVC ratio < 0.70

Exclusion criteria:

- Asthma
- Acute respiratory infections
- Pediatric respiratory diseases

Key parameters analyzed:

- FEV1 decline
- Exacerbation frequency
- Hospitalization rate
- Mortality outcomes

Results

1. Pathophysiology

COPD progression involves chronic airway inflammation and structural changes:

Step 1: Chronic Inflammatory Response

Exposure to harmful particles activates inflammatory cells (neutrophils, macrophages).

Step 2: Airway Narrowing

Thickening of bronchial walls and mucus hypersecretion.

Step 3: Alveolar Destruction (Emphysema)

Loss of elastic recoil reduces airflow during expiration.

Figure 1. Structural Changes in COPD (Description)

The illustration shows narrowed bronchi with mucus accumulation, inflammatory cell infiltration, and enlarged alveolar spaces due to destruction of alveolar walls in emphysema.

2. Clinical Manifestations

Common symptoms include:

- Chronic cough
- Sputum production
- Dyspnea (especially on exertion)
- Wheezing
- Chest tightness

Advanced disease may lead to:

- Cyanosis
- Weight loss
- Barrel chest
- Use of accessory respiratory muscles

Figure 2. Air Trapping in Emphysema (Description)

The diagram demonstrates hyperinflated lungs caused by air trapping during expiration due to loss of alveolar elasticity.

3. Diagnosis

The gold standard diagnostic test is **spirometry**.

Diagnostic criteria:

- Post-bronchodilator $FEV_1/FVC < 0.70$

Severity is graded based on FEV1 percentage predicted:

- GOLD 1 (Mild): $\geq 80\%$
- GOLD 2 (Moderate): 50–79%
- GOLD 3 (Severe): 30–49%
- GOLD 4 (Very Severe): $< 30\%$

Additional tests:

- Chest X-ray
- CT scan
- Arterial blood gases (advanced cases)

4. Complications

- Acute exacerbations
- Pulmonary hypertension
- Cor pulmonale
- Respiratory failure
- Increased cardiovascular risk

Figure 3. Progression to Cor Pulmonale (Description)

The illustration shows how chronic hypoxia leads to pulmonary vasoconstriction, increased pulmonary artery pressure, and right ventricular hypertrophy.

5. Treatment Strategies

Lifestyle and Preventive Measures

- Smoking cessation (most effective intervention)
- Vaccination (influenza, pneumococcal)
- Pulmonary rehabilitation
- Oxygen therapy (in severe hypoxemia)

Pharmacological Therapy

1. Short-acting bronchodilators (SABA, SAMA)
 - Symptom relief
2. Long-acting bronchodilators (LABA, LAMA)
 - Improve lung function
 - Reduce exacerbations
3. Inhaled corticosteroids (ICS)
 - For patients with frequent exacerbations
4. Combination therapy (LABA + LAMA ± ICS)
 - Most effective in advanced disease

6. Management of Exacerbations

Acute exacerbations are treated with:

- Short-acting bronchodilators
- Systemic corticosteroids
- Antibiotics (if bacterial infection suspected)
- Non-invasive ventilation (in severe cases)

Discussion

COPD is a preventable and treatable disease, yet remains underdiagnosed in early stages. The inflammatory process leads to irreversible structural lung damage over time.

Smoking cessation significantly slows disease progression. Early pharmacological therapy improves quality of life and reduces hospital admissions.

Pulmonary rehabilitation has shown strong evidence in improving exercise tolerance and reducing dyspnea.

Emerging therapies are focused on:

- Anti-inflammatory biologics
- Regenerative lung medicine
- Personalized inhaler therapy

Public health policies must address air pollution and tobacco control to reduce global COPD burden.

Conclusion

Chronic Obstructive Pulmonary Disease is a progressive internal disease characterized by persistent airflow limitation and systemic complications. Early detection, smoking cessation, pharmacological management, and pulmonary rehabilitation significantly improve patient outcomes. Comprehensive prevention strategies are essential to reduce global morbidity and mortality.

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MECHANISM OF ANTIOXIDANTS PREVENTING OXIDATIVE STRESS

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The vital processes of the organism are inextricably linked with the formation of reactive oxygen metabolites (ROS) of radical and non-radical origin, which are intermediate products of the four-electron reduction of oxygen to water. ROS participate in two main processes: on the one hand, the implementation of the body's defense mechanisms; on the other hand, excessive formation of ROS and their secondary products leads to a state known as oxidative stress. The development of oxidative stress in the body is prevented by substances with antioxidant properties of endogenous and exogenous origin. Today, it is difficult to find a single area of medicine, biochemistry, biophysics, pharmacy or food technology that would not study free radical oxidation and the antioxidant effect. The study of the antioxidant properties of substances is interdisciplinary and is aimed at improving human health and increasing life expectancy. One of the current directions in this field is the development of approaches to determine the integral parameters of antioxidant and antiradical capacity/activity, since the effectiveness of the body's antioxidant system may not be related to the content of a particular compound, but rather reflects the properties of the entire system.

The interest in studying the antioxidant properties of various objects is due to a number of factors related to the consumption of molecular oxygen by living organisms. Approximately 90% of the molecular oxygen inhaled by humans is involved in metabolic pathways, in which the energy generated during the oxidation of nutrients is stored in the mitochondria of cells as adenosine triphosphate (ATP). This process, called oxidative phosphorylation, provides the body with energy. In addition, along with this important process, all living organisms undergo reactions that form activated oxygen metabolites (AOM) from molecular oxygen, for example, $O_2^{\bullet-}$, $HO^{\bullet}$, $RO^{\bullet}$, H_2O_2 , $ROO^{\bullet}$, $1O_2$, OCl^- , $NO^{\bullet}$, $ONOO^-$, $NO_2^{\bullet}$ [1]. In the process of evolution, all living organisms have developed entire enzymatic systems that participate in one-, two-, and four-electron reduction reactions of molecular oxygen (Fig. 1) [2, 3].

According to Helmut Esterbauer [4], a human consumes 17,000 kg of molecular oxygen during a 70-year lifespan, during which time 800 to 1700 kg of activated oxygen metabolites (AOM) are produced.

Antioxidants protect cells from oxidative damage by neutralizing free radicals and reactive oxygen metabolites produced in the body. Their main mechanisms of action are based on the processes of electron or hydrogen atom transfer, stopping chain oxidation reactions, and binding metal ions. These mechanisms are important in maintaining the structural integrity of cell membranes, proteins, and DNA.

The role of oxidative stress in the development of many pathological conditions indicates the need for a deep study of the antioxidant system. The development of methods for the integral assessment of antioxidant/antiradical capacity, especially based on potentiometric approaches, allows for a more accurate assessment of the activity of substances in real biological conditions. Quantitative analysis of electron and electron-proton transfer reactions using model oxidizing systems serves to determine antioxidant efficiency by objective indicators.

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INFLUENCE OF HEAVY METAL IONS ON METABOLIC PROCESSES IN PLANT CELLS AND ADAPTATION MECHANISMS

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Environmental pollution caused by anthropogenic factors is a global environmental problem. Heavy metal ions accumulate in the soil and aquatic environment as a result of industrial waste, transport emissions, and improper use of mineral fertilizers. Since they are not biodegradable, they persist in the environment for a long time and are bioaccumulated by plants [4]. In the plant body, these ions disrupt cellular metabolism and lead to disruption of physiological processes. Therefore, studying the mechanisms of heavy metal stress at the cellular level is important for environmental safety and agricultural sustainability.

When heavy metal ions enter plant cells, they primarily negatively affect energy metabolism. This process leads to disruption of cellular metabolism. As a result of the inhibition of chlorophyll biosynthesis and structural changes in chloroplast membranes, photosynthetic efficiency decreases[1]. This limits the ability of plants to accumulate biomass and reduces productivity.

At the metabolic level, heavy metal ions bind to the active centers of enzyme molecules, slowing down the rate of biochemical reactions and limiting the functional activity of some enzymes (Table 1). As a result, carbohydrate metabolism, amino acid biosynthesis, and respiration processes slow down [2,3]. In some cases, ions change the protein conformation and cause complete inactivation of the enzyme.

Table 1

Biochemical effects of heavy metals on plant cells

Heavy metal	Main effect	Effect on enzymes	Result
Pb ²⁺	Pigment breakdown	Catalase activity decreases	Growth slows down
Cd ²⁺	ROS production increases	Peroxidase activity increases	Stress increases
Cu ²⁺	Oxidative damage	SOD activity changes	The membrane is damaged.

Under stress conditions, the production of reactive oxygen species (ROS) in the cell increases. ROS accelerate lipid peroxidation, increase the permeability of cell membranes, and damage proteins and nucleic acids [5]. Oxidative damage also disrupts plant water metabolism and nutrient transport (Figure 1).

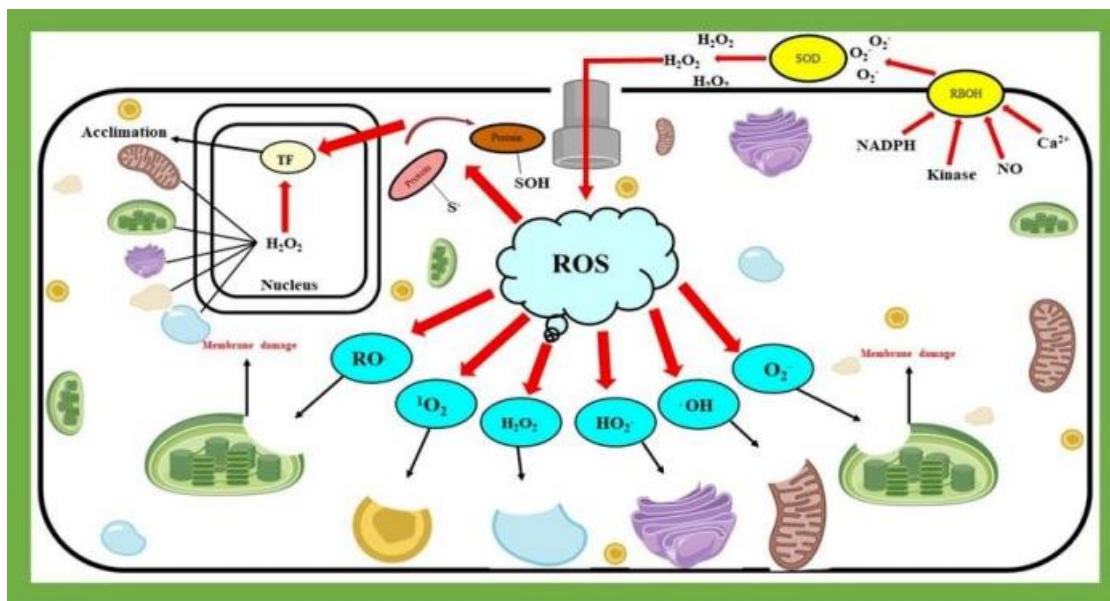


Figure 1. Mechanism of heavy metal ions inducing oxidative stress in plant cells.

In this study, the concept of “Metabolic Adaptation Index (MMI)” was proposed to assess metabolic and oxidative stress responses in plant cells under the influence of heavy metal ions (Pb^{2+} , Cd^{2+} , Hg^{2+}). This index is based on enzymatic biomarkers and ROS levels and allows for a quantitative assessment of the response of plants to metal stress. The study also revealed mechanisms of plant protection against toxic effects by complexing metal ions in vacuoles and cell walls, which provides a new approach for practical application in environmental monitoring and phytoremediation processes.

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Annotatsiya.

Yurakning muvofiqlashtirilgan qisqarishi, uning hayotiy nasos funksiyasining asosi bo'lib, o'ziga xos ixtisoslashgan elektr o'tkazuvchanlik tizimi orqali amalga oshiriladi. Ushbu maqola yurak elektr impulsini eng samarali va tezlikda tarqatuvchi, subendokardial joylashgan Purkinye tolalarining (PT) beqiyos gistologik moslashuvlarini chuqur tahlil qiladi. PT ning yirik hujayra hajmi, miofibrillalarning kamligi, glikogen zaxirasining yuqoriligi va eng muhimi, ular orasidagi hujayralararo aloqa kanali sonining ko'pligi impulsning tezligi 4 m/s gacha yetishini, ya'ni oddiy miokarddan bir necha barobar tez o'tkazilishini ta'minlaydi. Biz ushbu gistologik tuzilmalarning mexanizmlari yurak qorinchalarining sinxron depolarizatsiyasiga qanday imkon berishini va yurak ritmi buzilishlari aritmiyalar patogenezida ularning ahamiyatini ko'rib chiqamiz. Purkinye tolalarining me'yoriy va patologik gistologiyasini tushunish kardiologiya sohasida tashxis va davolash strategiyalarini ishlab chiqish uchun hal qiluvchi ahamiyatga ega.

Kalit soʻzlar: Purkinye tolalari, gistologiya, yurak oʻtkazuvchanligi, kardiomiotsitlar, hujayralararo aloqa kanali, elektr impulsi, aritmiya, sinxron qisqarish.

Kirish

Bizning tanamizdagi har bir hujayra, har bir aʼzo faoliyati birgina doimiy zarbga – yurak ritmiga bogʻliq. Yurakning uzluksiz, ritmik va samarali nasos funksiyasini taʼminlash, insoniyatdagi eng murakkab biologik mexanizmlardan biridir. Bu jarayon shunchaki mushaklarning qisqarishidan iborat emas; bu toʻliq elektr orkestri boʻlib, u yerda har bir nota (elektr impulsi) aniq bir vaqtda va belgilangan tezlikda yetkazilishi shart. Bu tizimning eng muhim va deyarli oxirgi nuqtasi – Purkinye tolalaridir. Agar yurakni katta shaharga qiyoslasak, Purkinye tolalari bu elektr energiyasini shaharning har bir burchagiga bir zumda va yuqori kuchlanishda tarqatuvchi magistral liniyalardir. Agar bu tarqatuvchi yoʻllarda bir soniyalik uzilish boʻlsa, qorinchalarning qisqarishi (sistola) sinxronligi buziladi, bu esa hayot uchun xavfli oqibatlarga, yaʼni aritmiyalarga olib keladi.

Oddiy kardiomiotsitlar qisqarish uchun ixtisoslashgan boʻlsa, Purkinye tolalari evolyutsiya tomonidan faqat bitta maqsadga – elektr oʻtkazuvchanligini maksimal darajaga yetkazishga optimallashtirilgan. Aynan ularning gistologik tuzilishi – ularning nega bunchalik tez ishlay olishining ilmiy siri hisoblanadi. Ular miokard mushaklariga qaraganda kattaroq, glikogen tezkor energiya zaxirasi bilan toʻyingan va eng muhimi, ular orasidagi bogʻlanishlar hujayralararo aloqa kanali soni va sifati aql bovar qilmas darajada yuqori.

Ushbu maqolaning maqsadi – yurakning elektr oʻtkazuvchanlik tizimidagi ushbu ajoyib inzhenerlik moʻjizasining gistologik asoslarini ochib berishdir. Biz bu maxsus hujayralar tuzilishining har bir elementi ularning noyob funksiyasiga qanday xizmat qilishini va ushbu tizimning buzilishi klinik amaliyotda qanday muammolarni keltirib chiqarishini chuqur tahlil qilamiz. Biz Purkinye tolalarining “kamdan-kam uchraydigan, lekin hal qiluvchi” rolini tushunish kardiologik patologiyalarni chuqurroq anglashga va yangi davolash usullarini yaratishga kalit boʻlishini koʻrsatib beramiz.

Asosiy qism

Kim Purkinye edi?

Bu tolalar o'z nomini ularni kashf etgan buyuk chex fiziologi Yan Evangelista Purkinye (Jan Evangelista Purkyně, 1787–1869) sharafiga olgan. Bu inson shunchaki tolalarni topibgina qolmay, balki zamonaviy fiziologiya va gistologiya faniga ulkan asos solganlardan biri hisoblanadi. 1839-yilda u o'zining mikroskopik kuzatuvlari natijasida, oddiy yurak mushak hujayralaridan farq qiluvchi, yirik, ochiq rangli, maxsus tolalarni aniqladi. O'sha davr ilm- fanida bu kashfiyotga darhol to'liq baho berilmadi, ammo vaqt o'tishi bilan ma'lum bo'ldiki, yurakning har bir zarbasi ortida yashirinib turgan elektr poygasining asosiy ishtirokchisi aynan shu tolalardir. Bu kashfiyot yurakning elektrofiziologik tizimining ilmiy tushunchasiga asos soldi. Bu shuni anglatadiki, Purkinye kashfiyoti oddiy gistologik fakt emas, balki kardiologiya fanining butun bir yo'nalishini ochib bergan hayotiy tushunchadir.

Purkinye tolalari yurakning elektr tizimida aniq bir strategik joylashuvga ega. Ular Gis tutami orqali AV tugundan kelgan impulsni qabul qiladi va uni qorinchalarning deyarli barcha qisqaruvchi mushaklariga tarqatish uchun mas'uldir. Ular yurak qorinchalarining ichki yuzasini qoplagan yupqa endokard ostidagi biriktiruvchi to'qima qatlamida (subendokardial bo'shliq) joylashadi. Bu joylashuv ularga qorinchalarning butun miokardiga – eng ichki mushak qatlamidan boshlab – elektr impulsini to'g'ridan-to'g'ri va tez yetkazib berish imkonini beradi. Qorinchalar Boshlang'ichi: Impuls qorinchalarning uchiga (apeksiga) yaqinlashganda, PT to'rlari (tarmoqlari) kengayib, yurakning eng og'ir ishlaydigan va qonni katta tomirlarga haydash uchun mas'ul bo'lgan qismlarini bir zumda qo'zg'atadi. Hayotiy Energiya: Bu tizimning to'g'ri joylashuvi tufayli qorinchalar tepadan pastga emas, balki pastdan tepaga (apeksdan asosga) qisqarishni boshlaydi. Bu qonni aorta va o'pka arteriyasiga maksimal samaradorlik bilan haydash uchun eng optimal nasos mexanizmini yaratadi. Demak, Purkinye tolalarining nafaqat tuzilishi, balki ularning yurak devoridagi strategik joylashuvi ham yurakning hayotiy funksiyasi uchun hal qiluvchi ahamiyatga ega.

Purkinye tolalari (PT) yurak qorinchalarini sinxron tarzda qisqartirish uchun zarur bo'lgan chidamli, tezkor elektr o'tkazgichlar sifatida evolyutsiyaning noyob mahsulidir. Ularning gistologik tuzilishi oddiy kardiomiotsitlarning vazifasidan tubdan farq qiladi, bu esa ularning funksional ustunligini ta'minlaydi. Hujayra morfologiyasidagi farqlar hajm – o'tkazuvchanlik kafolati, Purkinye tolalari oddiy ishlaydigan miokard hujayralariga nisbatan sezilarli darajada kattaroqdir. Yirik hujayra hajmi: PT ning diametri an'anaviy kardiomiotsitlarnikidan 2 dan 4 baravar gacha katta bo'ladi. Elektr Qarshilik Qonuni: Fizika nuqtai nazaridan, o'tkazgichning

elektr qarshiligi uning ko'ndalang kesim yuzasiga teskari proportsionaldir. $R \propto 1/A$ formula bu yerda ham o'z kuchiga ega. Hujayra hajmining oshishi ichki (aksial) qarshilikni keskin kamaytiradi. Natijada, elektr zaryadlari (ionlar) hujayra ichida deyarli to'siqsiz harakat qiladi, bu esa impulsning tarqalish tezligini oshiruvchi eng muhim fizologik omil hisoblanadi. PT ning sitoplazmasi ularning o'tkazuvchanlik funksiyasiga moslashgan noyob kimyoviy tarkibga ega. Miofibrillalar Kamayishi: Oddiy qisqaruvchi hujayralardan farqli o'laroq, PT da qisqaruvchi oqsil iplari – miofibrillalar juda kam va tartibsiz joylashgan bo'lib, ular asosan yadro atrofida cheklangan. Bu ularning asosiy energiya sarfini qisqarish jarayonidan elektr uzatish jarayoniga (ion nasoslari faoliyatiga) yo'naltirishga imkon beradi. Glikogenning Ko'pligi: PT sitoplazmasi katta miqdordagi glikogen donalari bilan to'yingan. Gistologik bo'yalishda aynan shu glikogen tufayli ular ochroq, yengilroq ko'rinadi (bu ko'pincha "halo" yoki "vakuolli" ko'rinish deb ham ataladi). Tezkor Metabolizm: Bu glikogen zaxirasi tez metabolizmlanib, yuqori tezlikdagi harakat potensialini ta'minlash va ion muvozanatini saqlash uchun zarur bo'lgan Na^+K^+ ATPaza nasoslarining ishlashiga tezkor ATP energiya yetkazib beradi.

Purkinje tolalari tizimining ajoyib tezligi (impuls tezligi approx 4 m/s gacha) aynan hujayralararo bog'lanishlarning sifati va soniga bog'liq. Bu tolalarda hujayralarni bog'laydigan oraliq disklar va ularning ichidagi konneksin oqsillaridan tashkil topgan kanallar (konneksonlar) miqdori va o'lchami oddiy miokard hujayralariga qaraganda sezilarli darajada yuqoridir. Maxsus Konneksin Turlari: PT da, ayniqsa, Konneksin-40 (Cx 40) va Konneksin-43 (Cx 43) ning yuqori ifodalanishi kuzatiladi. Cx 40 juda past qarshilikka ega bo'lib, bu impulslarning eng tez o'tishini ta'minlaydi. Sinxronizatsiyaning Gistologik Asosi: Bu yuqori o'tkazuvchanlik Purkinje tolalariga elektr impulsini qorinchalarning har bir nuqtasiga deyarli bir vaqtda yetkazish imkonini beradi. Bu esa qorinchalarning bir maromda, kuchli va samarali qisqarishini – sinxron sistolani ta'minlashning muhim shartidir.

Purkinje tolalarining mukammal ishlashi yurakning sog'lom ritmi uchun kafolatdir. Agar ushbu tizimning ixtisoslashgan gistologik tuzilmasida uzilish yoki buzilish yuzaga kelsa, bu impuls tarqalishining buzilishiga va xavfli aritmiyalarning paydo bo'lishiga olib keladi.

Yurakning qon bilan ta'minlanishi buzilganida (miokard infarkti yoki ishemiya) Purkinje tolalari ayniqsa zaif bo'ladi. Energetik Tanqislik: Ishemiya sharoitida ATP ishlab chiqarilishi keskin pasayadi. Yuqorida aytib o'tilganidek, PT faoliyati uchun zarur bo'lgan ion nasoslari (Na^+K^+ ATPaza) ishdan chiqadi. Gap Junctions

Disfunksiyasi: Hujayra ichidagi ATP darajasining pasayishi va kislotalilikning oshishi (atsidoz) Konneksin-43 kanallarining (Gap Junctions) yopilishiga olib keladi. Kanallar yopilgach, hujayralar orasidagi elektr bog'lanish uziladi. Natijada, impuls yopiq kanallardan o'ta olmaydi – bu o'tkazuvchanlik blokadasini keltirib chiqaradi.

Purkinye tolalarining buzilishi eng xavfli aritmiyalardan biri – Re-entry Impulsning aylanma harakati mexanizmining shakllanishida hal qiluvchi rol o'ynaydi. Agar Purkinye tarmog'ining bir qismida ishemiya yoki shikastlanish tufayli impuls sekinlashsa yoki to'xtasa (bloklansa), omon qolgan, ammo sekinlashgan yo'llar impulsning noto'g'ri yo'nalishda qaytib kelishi va o'zini-o'zi qayta qo'zg'atishi uchun sharoit yaratadi. Qorinchalar Fibrillyatsiyasi (VF): Ushbu patologik aylanma harakat (re-entry) zanjirlari ko'pincha qorinchalar fibrillyatsiyasi (eng xavfli aritmiya) ning bevosita sababchisi bo'lib xizmat qiladi. VF da qorinchalar sinxron tarzda qisqarish o'rniga, notekis, "titroq" harakatlarni amalga oshiradi, bu esa qon haydash funksiyasining to'xtashini anglatadi.

PT ning o'ziga xos gistologiyasi va ion kanallari (masalan, Nav1.5 tez Na⁺ kanallari) tarkibi ularni ayrim dorilarga, xususan, 1-sinf antiaritmik dorilarga juda sezgir qiladi. Gistologik Maqsad: Ushbu dorilar tez Na⁺ kanallarini bloklaydi va Purkinye tolalari orqali impuls o'tkazilish tezligini maqsadli sekinlashtiradi. Davolash Strategiyasi: Kardiologlar PT dagi gistologik tuzilmalarning elektrofiziologik xususiyatlarini bilgan holda, dorilarning ta'sirini aniq prognoz qilishlari mumkin. Masalan, dorilar PT o'tkazuvchanligini normallashtirib, aritmiyalar zanjirini buzadi.

Xulosa

Yurakning ritmik va samarali qisqarishi, inson hayotining uzluksiz davom etishi uchun asos bo'lgan murakkab mexanizm, Purkinye tolalarining noyob gistologik ixtisoslashuvi tufayli ta'minlanadi. Bizning tahlilimiz shuni ko'rsatdiki, bu tolalar tasodifiy tuzilmalar emas, balki elektr impulsini maksimal tezlikda tarqatishga yo'naltirilgan, mukammal biologik injenerlik yechimidir.

Purkinye tolalarining yirik hujayra hajmi va miofibrillalarning kamligi impuls tarqalishidagi ichki qarshilikni minimal darajaga tushiradi. Sitoplazmadagi glikogenning yuqori miqdori esa ion nasoslarining yuqori samaradorligini ta'minlash uchun tezkor energiya manbai bo'lib xizmat qiladi. Eng muhimi, Cx40 va Cx43 turidagi konneksinlar bilan boyitilgan ning yuqori zichligi qorinchalarning butun miokardini deyarli bir vaqtda qo'zg'atishni, ya'ni sinxron sistolani kafolatlaydi. Bu gistologik ustunlik, PT ni yurak ritmi va qon haydash funksiyasining barqarorligi

uchun hal qiluvchi elementga aylantiradi. Purkinje tolalarining gistologik asoslarini chuqur tushunish kardiologiya sohasida yangi davolash strategiyalarini ishlab chiqish uchun katta istiqbol ochadi. Aritmiyalar, ayniqsa qorinchalar fibrillyatsiyasi, ko'pincha aynan PT dagi Gap Junctions disfunktsiyasi yoki ularning atrofidagi o'tkazuvchanlik blokadalarini bilan bog'liq. Ushbu gistologik mexanizmlarni maqsadli o'rganish va ularga ta'sir o'tkazish orqali, biz dorilar va elektrofiziologik muolajalarning (masalan, ablatsiya) aniqligini oshirishimiz mumkin. Kelajakda, agar PT ning o'ziga xos gistologik fenotipini sun'iy ravishda tiklash yoki yaratish imkonini topilsa, bu yurakning shikastlangan elektr yo'llarini regeneratsiya qilish yo'lidagi katta qadam bo'ladi. Xulosa qilib aytganda, Purkinje tolalarining gistologik ixtisoslashuvi shunchaki anatomik fakt emas, balki yurakning hayotiy funksiyasini ta'minlovchi biologik ustunlikdir. Ularning sirini ochish yurak-qon tomir kasalliklari bilan kurashishda yangi eshiklarni ochadi.

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THE EFFECTIVENESS OF USING GAMES IN TEACHING ENGLISH TO YOUNG LEARNERS

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Abstract: This article investigates the effectiveness of using games as a teaching tool in English language instruction for young learners. In recent years, game-based learning has gained significant attention as an alternative to traditional teacher-centered approaches. The study explores how games influence young learners' motivation, vocabulary acquisition, speaking skills, and overall engagement in the classroom. Using a qualitative and descriptive research approach, data were analyzed from existing studies, classroom observations, and educational research conducted over the past decade. The findings indicate that games create a low-anxiety learning environment, enhance learners' participation, and promote meaningful language use. The results confirm that incorporating games into English language teaching significantly improves learning outcomes for young learners compared to traditional instructional methods.

Keywords: *Young learners, game-based learning, English language teaching, motivation, communicative competence, EFL.*

Аннотация: Данная статья исследует эффективность использования игр как инструмента преподавания английского языка для молодых учащихся. В последние годы обучение через игры привлекает значительное внимание как альтернатива традиционным подходам, ориентированным на учителя. Исследование рассматривает влияние игр на мотивацию учащихся, освоение словарного запаса, навыки говорения и общую вовлечённость в классе. Используя качественный и описательный подход, данные были проанализированы на основе существующих исследований, наблюдений в классе и образовательных работ, проведённых за последнее десятилетие. Результаты показывают, что игры создают среду обучения с низким уровнем тревожности, повышают участие учащихся и способствуют осмысленному использованию языка. Итоги исследования подтверждают, что внедрение игр в

преподавание английского языка значительно улучшает результаты обучения молодых учащихся по сравнению с традиционными методами преподавания.

Ключевые слова: *Молодые учащиеся, обучение через игры, преподавание английского языка, мотивация, коммуникативная компетенция, EFL.*

INTRODUCTION

Teaching English to young learners requires instructional approaches that are engaging, meaningful, and suitable for their cognitive and emotional development. Traditional methods that rely heavily on grammar explanation and memorization often fail to maintain children's attention and motivation. As a result, educators have increasingly turned to games as an effective pedagogical tool in language classrooms.

Games naturally align with how children learn—through play, interaction, and exploration. When integrated into English language teaching, games provide opportunities for learners to practice language skills in a relaxed and enjoyable environment. This study aims to examine the effectiveness of using games in teaching English to young learners and to highlight their impact on language development and classroom dynamics.

LITERATURE REVIEW

Numerous scholars have emphasized the importance of games in language learning, particularly for young learners. According to Piaget (1962), children learn best through active engagement and play, which supports cognitive development. Vygotsky (1978) further argued that learning occurs through social interaction, a principle that games strongly promote.

Wright, Betteridge, and Buckby (2006) state that games help learners experience language in a meaningful context while encouraging cooperation and communication. Similarly, Harmer (2015) notes that games increase learners' motivation and reduce anxiety, allowing children to use language more freely.

Cameron (2001) highlights that games support vocabulary acquisition by providing repetition and contextualized use of new words. Moreover, Slattery and Willis (2001) emphasize that games are particularly effective in developing speaking and listening skills among young learners, as they encourage spontaneous language use.

Recent studies also suggest that game-based learning enhances communicative competence and learner autonomy (Richards & Rodgers, 2014). Overall, the literature

strongly supports the use of games as an effective strategy in teaching English to young learners.

METHODOLOGY

This study employed an empirical research design to examine the effectiveness of using games in teaching English to young learners. Data were collected through a combination of tests, classroom observations, and learner questionnaires to assess language development, engagement, and motivation. The methodology is structured into four main components: Participants, Procedure, Instruments, and Data Analysis.

- **Participants**

The participants of the study were 24 young learners aged 8–9, enrolled in a private English language program. The learners were randomly divided into two groups: *an experimental group* ($n = 12$), which received instruction through game-based activities, and *a control group* ($n = 12$), which received traditional teacher-centered instruction. Both groups had similar English proficiency levels as determined by a pre-test administered at the start of the study.

- **Procedure**

The study lasted four weeks, with three 40-minute English lessons per week. The experimental group engaged in various games, including vocabulary bingo, role-play activities, physical movement games, and digital language games. These games were designed to reinforce vocabulary, improve speaking skills, and encourage collaborative communication.

The control group followed a traditional grammar-translation approach, focusing on textbook exercises, memorization, and teacher-led drills without interactive games.

- **Instruments**

1. *Vocabulary and Speaking Pre-Test and Post-Test* – standardized age-appropriate tests assessing comprehension and oral production.
2. *Observation Checklist* – teacher recorded engagement, participation, and interaction during lessons.
3. *Learner Questionnaire* – a short survey using a 5-point Likert scale to evaluate learners' enjoyment and motivation.

- **Data Analysis**

Pre-test and post-test scores were analyzed using descriptive statistics, including mean and standard deviation. Differences between the experimental and control groups

were evaluated to determine the effect of game-based instruction. Observational and questionnaire data were analyzed thematically to supplement quantitative results.

RESULTS AND DISCUSSION

This section presents the findings of the empirical study and discusses their implications. The results include test scores, learner engagement observations, and questionnaire responses. The discussion interprets these findings in relation to previous research and theoretical frameworks.

Quantitative Results

Group	Pre-Test Mean (%)	Post-Test Mean (%)	Improvement (%)
Experimental	58	81	+23
Control	60	68	+8

The experimental group demonstrated a substantial improvement in both vocabulary and speaking skills compared to the control group. The mean increase of 23% in the experimental group suggests that game-based learning significantly enhanced language acquisition, whereas the control group showed a smaller improvement of 8%, indicating limited gains from traditional instruction.

Engagement and Motivation

Observation checklists revealed that learners in the experimental group were highly engaged, frequently volunteering answers, interacting with peers, and demonstrating enthusiasm for activities. In contrast, control group learners were less participatory and often appeared passive during lessons.

The questionnaire results further confirmed these findings:

- **Experimental group** average enjoyment score: 4.7 / 5
- **Control group** average enjoyment score: 3.2 / 5

This indicates that games not only improve language outcomes but also boost learners' motivation and create a positive learning environment.

Discussion

These findings align with previous research emphasizing the benefits of play and interaction in language learning (Wright, Betteridge, & Buckby, 2006; Cameron, 2001). Games provide meaningful contexts for language use, allowing young learners to practice vocabulary and speaking skills naturally. Additionally, the low-pressure environment reduces anxiety, supporting Krashen's Affective Filter Hypothesis (Krashen, 1985).

The study also highlights that engagement is a crucial factor in successful language learning. The experimental group's increased participation suggests that interactive and playful methods can enhance communicative competence and foster collaborative skills.

However, the effectiveness of games depends on their alignment with learning objectives. Poorly designed games may distract learners rather than support learning, emphasizing the importance of thoughtful lesson planning.

CONCLUSION

In conclusion, the use of games in teaching English to young learners is an effective and powerful instructional strategy. Games enhance motivation, promote active participation, and support the development of key language skills such as vocabulary, speaking, and listening. Compared to traditional methods, game-based learning creates a more engaging and learner-centered classroom environment.

The findings of this study suggest that English language teachers should thoughtfully integrate games into their lesson plans to maximize learning outcomes. Future research may focus on empirical classroom-based studies to further explore the long-term impact of game-based learning on language proficiency.

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THE ROLE OF MODERN TRAINING TECHNOLOGIES IN DEVELOPING FUNCTIONAL READINESS OF ATHLETES

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Abstract

The rapid development of sports science and digital innovation has significantly transformed the methodology of athletic preparation. Functional readiness, understood as the integrated capacity of physiological, biomechanical, and psychological systems to sustain optimal performance under competitive conditions, has become a central concept in contemporary sports training. The purpose of this study is to analyze the role of modern training technologies in enhancing functional readiness among athletes. The research explores wearable monitoring systems, biomechanical analysis tools, artificial intelligence-based performance modeling, virtual and augmented reality applications, and data-driven load management strategies.

The study is based on a systematic analysis of contemporary scientific literature in sports physiology, sports biomechanics, and training theory. The findings demonstrate that modern technologies allow precise monitoring of training loads, early detection of overtraining risks, individualized program design, and optimization of recovery processes. The integration of digital tools contributes to improved cardiovascular endurance, neuromuscular coordination, strength, and psychological resilience.

The article concludes that modern training technologies serve not only as supportive tools but also as transformative instruments in sports training systems, significantly increasing the efficiency of functional preparation and long-term athletic development.

Keywords

Functional readiness; sports training; wearable technologies; performance monitoring; training load management; sports physiology; digital sports technologies.

INTRODUCTION

The contemporary sports environment is characterized by increasing competitiveness, high performance standards, and scientific integration into training processes. In elite and youth sports alike, achieving stable results requires not only physical strength and

technical mastery but also a high level of functional readiness. Functional readiness refers to the athlete's ability to perform specific motor tasks effectively under varying physical and psychological loads while maintaining physiological balance.

Traditionally, athletic training relied heavily on empirical coaching experience and standardized load distribution models. Although these methods provided significant results, they often lacked precision and individualization. With the emergence of sports science disciplines such as exercise physiology, biomechanics, and sports psychology, the concept of functional preparation became more structured and measurable.

In recent decades, technological progress has introduced innovative solutions into sports practice. Wearable heart rate monitors, GPS tracking systems, force platforms, motion capture technologies, and artificial intelligence-based analytics have fundamentally changed how coaches evaluate and manage athlete performance. These tools provide real-time feedback, objective data, and predictive insights, which allow the optimization of training programs.

The problem addressed in this article lies in the need to systematize the role of modern training technologies in enhancing functional readiness. While many studies examine isolated technological tools, a comprehensive analysis of their integrative impact on functional development remains necessary.

The purpose of this study is to determine how modern training technologies contribute to improving physiological efficiency, neuromuscular coordination, load adaptation, and recovery processes in athletes.

Main Body

Concept of Functional Readiness in Modern Sports Science. Functional readiness is a multidimensional construct encompassing cardiovascular endurance, respiratory efficiency, muscular strength and power, neuromuscular coordination, metabolic stability, and psychological preparedness. It represents the dynamic balance between load and recovery, stress and adaptation.

In sports physiology, functional readiness is often assessed through parameters such as VO_2 max, lactate threshold, heart rate variability, muscle activation patterns, and hormonal indicators. These markers reflect the athlete's ability to tolerate and adapt to training stimuli.

Without adequate functional readiness, athletes are more prone to fatigue, injuries, performance instability, and overtraining syndrome. Therefore, systematic monitoring and targeted development of functional systems are essential.

Wearable Technologies and Real-Time Monitoring. One of the most significant innovations in sports training is the widespread use of wearable technologies. Devices

such as heart rate monitors, GPS trackers, accelerometers, and smartwatches provide continuous physiological and biomechanical data during training sessions and competitions.

Heart rate variability monitoring allows assessment of autonomic nervous system balance and recovery status. GPS systems measure distance covered, speed, acceleration, and positional movement, particularly in team sports. Accelerometers evaluate movement intensity and mechanical load.

The integration of wearable devices improves functional readiness by enabling:

- Accurate regulation of aerobic and anaerobic workloads

- Prevention of excessive fatigue

- Immediate adjustment of training intensity

- Individualized adaptation programs

Research indicates that athletes who train under data-guided monitoring demonstrate better cardiovascular adaptation and lower injury rates compared to those relying solely on subjective assessment.

Biomechanical Analysis and Movement Optimization
Biomechanical technologies, including motion capture systems and force plates, allow detailed analysis of movement mechanics. These tools identify inefficiencies in technique, asymmetries, and improper load distribution.

For example, force platform analysis helps evaluate explosive strength and balance. Motion capture systems detect deviations in joint angles during sprinting or jumping tasks. By correcting technical errors, athletes can improve neuromuscular coordination and reduce energy waste.

Optimized biomechanics directly influence functional readiness because efficient movement reduces physiological strain and enhances performance economy.

Conclusion

The integration of modern training technologies into athletic preparation represents a transformative shift in the development of functional readiness. Contemporary sports performance is no longer based solely on traditional coaching intuition and standardized training loads; rather, it is increasingly guided by objective data, physiological monitoring, and individualized adaptation models.

Functional readiness, as a multidimensional construct encompassing cardiovascular endurance, neuromuscular coordination, metabolic efficiency, and psychological resilience, requires systematic assessment and scientifically grounded intervention. Modern technologies—such as wearable monitoring systems, biomechanical analysis tools, artificial intelligence-based performance modeling, and digital recovery

platforms—provide precise and real-time insights into an athlete's physiological and biomechanical status.

The findings discussed in this study indicate that wearable devices enhance the regulation of training intensity and prevent overtraining by continuously tracking heart rate variability, movement patterns, and workload distribution. Biomechanical technologies optimize movement efficiency, reducing unnecessary energy expenditure and minimizing injury risks. Artificial intelligence and data analytics facilitate predictive performance modeling, enabling coaches to tailor training programs according to individual adaptation rates. Furthermore, recovery technologies and sleep-tracking systems contribute to maintaining autonomic balance and accelerating regeneration processes.

Importantly, the use of modern training technologies supports the principle of individualization, which is fundamental in contemporary sports science. Athletes differ significantly in genetic predisposition, adaptation capacity, psychological tolerance, and biomechanical characteristics. Therefore, technology-assisted monitoring ensures that training stimuli correspond precisely to the athlete's functional state.

However, the implementation of digital tools must be accompanied by professional expertise. Technological data require correct interpretation within the framework of sports physiology and training theory. Overreliance on quantitative metrics without contextual analysis may lead to misjudgment of performance readiness. Thus, the optimal approach combines scientific knowledge, coaching experience, and technological support.

In conclusion, modern training technologies significantly enhance the development of functional readiness in athletes by improving monitoring accuracy, optimizing load management, reducing injury risks, and supporting individualized training design. Their systematic integration into sports practice contributes to sustainable athletic performance and long-term development. Future research should focus on interdisciplinary integration, ethical aspects of data usage, and the development of accessible technological solutions for youth and developing sports systems.

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THE STUDY OF KASHKADARYO FOLK EPICS AS AN OBJECT OF LINGUOCULTURAL RESEARCH

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Annotation. *This article reveals the principles of analyzing, from a linguocultural perspective, such units regarded as an integral part of folk culture as ethnographisms, phraseological units, similes and metaphors, paremiological, onomastic, and precedent units, as well as praises, wishes and curses, terms of endearment, euphemisms and dysphemisms, and beliefs employed in the texts of Qashqadaryo folk epics, and elucidates their role in the national language, history, and culture.*

Keywords: *folk epic, traditional epic bard, language, culture, linguo-folklore studies, linguocultural approach, linguocultural unit.*

In recent years, research conducted within the framework of the linguocultural approach has assumed a leading position in linguistics, as the study of the influence of culture on language, or conversely, of language on culture, has consistently remained one of the central issues in scholarly inquiry.

In his dissertation devoted to the linguocultural features of the epic “Alpomish,” D. Ashurov emphasizes that, in the static study of a text, literary works, audio materials in textual form, and samples of oral folk creativity are of particular significance. According to the scholar, “texts regarded as the property of the people, reflecting the national spirit and exerting a strong influence on the national consciousness, express the national mentality and culture to a greater extent than the author’s intention; they are preserved as stable patterns and continue to re-emerge over time” [1, 25].

In Uzbek linguistics, a number of studies have been devoted to the vocabulary of folk epics. In particular, V. Zhirmunsky and H. Zarifov examined the Uzbek folk heroic epic; Sh. Shoabdurahmonov investigated the linguistic features of the epic “Ravshan”; S. Yuldasheva analyzed the poetics of the Uzbek folk heroic epic “Alpomish”; S. Tursunov explored the lexical features of the epic “Alpomish”; Z. Xolmanova studied the vocabulary of the epic “Shayboniykhan” (based on the Polkan poet’s version); I. Boltayeva examined the nature of epithets in Uzbek folk epics; J. Xolmurotova

analyzed the functional-stylistic features of the vocabulary of the Northern Khorezm epics; Kh. Ro‘zimboyev conducted a lexical-semantic analysis of the language of the Southern Khorezm epics (on the example of the epics “Shahriyor” and “Malikayi Zavriyo”); A. Rahimov carried out a comparative-historical analysis of the vocabulary of Uzbek folk epics (based on the works of Ergash Jumanbulbul o‘g‘li); Kh. Toshmatov studied poetic transfers in Uzbek folk epics; Sh. Mahmadiyev investigated stylistic formulas in the language of Uzbek folk epics; G. Jumanazarova examined the lexical and linguopoetic features of the epic “Shirin bilan Shakar” (based on the version of Fozil Yo‘ldosh o‘g‘li); A. Xaliqov analyzed the lexical-semantic features of the language of the epic “The Birth of Go‘ro‘g‘li”; Q. Olloyorov researched the onomastics of the Khorezm epics; R. Rasulov studied the syntactic relations of words in the epic “Alpomish”; I. Yormatova investigated the poetics of the Uzbek heroic epic; Y. Hojiyev examined the semantic-structural, conceptual, and lexicographic features of nominative units expressing personal spiritual qualities in the epic “Alpomish”; D. Ashurov explored the linguocultural features of the epic “Alpomish”; B. Yunusova analyzed the lexical-semantic and stylistic features of onomastic units in the epic “Alpomish”; and D. Abatov researched the onomastics of the Qashqadaryo folk epics. In the dissertation entitled “*Onomastics of the Khorezm Epics*” by Q. Olloyorov, the proper nouns occurring in the Khorezm epics are classified into lexical-semantic groups such as place names, personal names, and other types of onomastic units; the position of the onomastic units identified in folk epics within the lexical system of the language is determined; their linguistic value is elucidated; the historical-etymological microsystems of onomastic units, including native and borrowed layers, as well as their formal structures, are examined; and their simple (primary simple and derived simple), compound, and complex types, along with their one-component, two-component, and multi-component varieties, are substantiated [2, 50].

Although the aforementioned studies have addressed the general aspects of the topic, the folk epics performed by prominent representatives of the Qashqadaryo epic tradition have not been comprehensively examined from a linguocultural perspective in a monographic format.

Linguocultural units are defined as “language units formed through the integration of the meaning of a linguistic sign and cultural content, in whose semantics cultural information is distinctly manifested,” and they include “phraseological units, standards, symbols, metaphors, fixed similes, speech etiquette formulas, words related to customs and rituals, riddles, national realia, archetypes, mythologemes, lacunae, precedent units, and others” [3, 11].

It is well known that “within the anthropocentric approach to language, there are two principal concepts: the conceptual worldview associated with mythology, religious belief, philosophy, science, and culture; and the linguistic worldview that emerges precisely under the influence of language” [4, 11-12]. According to D. Ashurov, “the linguistic worldview is most often manifested in the process of nomination. In this process, the cultural and spiritual world of both the individual and the nation becomes distinctly visible. Linguocultural studies are not limited solely to proper nouns; they are also conducted on the basis of phraseological units, similes, precedent names, riddles, and similar elements” [1, 26].

Folk epics, regarded as the unfading mirror of the people’s artistic consciousness, can serve as an extensive object of linguocultural research, since the way of life, customs and traditions, worldview, and attitudes toward society and nature—in short, the culture of a nation—are manifested in its language. “The spiritual world and concepts of the ancestors have been transmitted to the present day through proverbs, sayings, phraseological expressions, metaphors, and cultural signs” [5, 108]. “Folklore constitutes one of the primary sources of national culture and national consciousness. As the materials of oral folk creativity embody the culture and spiritual world of the people, they represent a significant object of linguocultural research. Within them are concentrated the elements of national culture, including myths, beliefs, national philosophy, national pedagogy, aesthetic views and perceptions, artistic taste, morality, and ideals” [6, 100]. From this perspective, the study of folklore works, particularly folk epics, opens the way to researching national culture.

In the linguocultural study of the Qashqadaryo folk epics, the following elements are of particular importance:

- 1) ethnographisms;
- 2) phraseological units;
- 3) similes;
- 4) paremiological units;
- 5) onomastic units;
- 6) standards;
- 7) speech culture and speech etiquette;
- 8) symbols;
- 9) prayers and curses;
- 10) forms of address.

In general, the linguocultural study of units used in the Qashqadaryo folk epics—such as ethnographisms, phraseological units, similes and metaphors, paremiological,

onomastic, and precedent units, praises, wishes and curses, terms of endearment, euphemisms and dysphemisms, and beliefs, which constitute an integral part of folk culture—not only provides valuable information about national consciousness and folk culture but also makes it possible to draw accurate and well-founded conclusions about the language, history, and culture of the people whose linguocultural units are being examined.

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ISLAMIC BANK RISK MANAGEMENT PROBLEMS AND SOLUTIONS IN UZBEKISTAN

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Abstract: this article investigates the multifaceted risk management challenges confronting Islamic banking in Uzbekistan as the country transitions from pilot initiatives to full-scale implementation following the landmark Islamic banking law enacted in early 2026. By analyzing recent regulatory advancements, including the Central Bank's IFSB membership, AAOIFI alignment initiatives, and the planned national rollout beginning in 2027, the study highlights critical vulnerabilities in Shariah governance, liquidity provisioning for asset-backed products, operational transitions within Islamic windows, and human capital readiness amid rapid sector expansion. Ultimately, it proposes a forward-looking framework of adaptive supervisory tools, digital risk analytics, and targeted capacity-building partnerships to foster resilient, Shariah-compliant growth that enhances financial inclusion and positions Uzbekistan as a emerging hub for Islamic finance in Central Asia.

Keywords: Islamic banking Uzbekistan, Shariah governance risk, regulatory transition 2026, liquidity management challenges, operational risk in Islamic windows, human capital development, fintech-enabled risk monitoring, sukuk market potential, Central Bank roadmap 2030, AAOIFI IFSB harmonization, sustainable Islamic finance, civil law adaptation.

The global Islamic finance industry continues to demonstrate remarkable resilience, with assets surpassing USD 6 trillion by the end of 2024 and sustained expansion projected through 2026 despite geopolitical uncertainties and tightening monetary conditions. In this context Uzbekistan has emerged as one of the most dynamic new entrants in the sector, having secured full legislative approval for a dedicated Islamic banking framework in February 2026 after intensive preparatory work throughout 2025. This development builds directly upon the Central Bank's accession to the Islamic Financial Services Board in late 2024 and its formal application for AAOIFI membership, signaling a strategic commitment to international best practices. At the same time the forthcoming launch of Islamic services in at least one commercial bank by 2027 and expansion to three institutions by 2030 introduces unprecedented complexity for risk oversight. Policymakers and practitioners must therefore address unique structural vulnerabilities that arise when embedding profit-and-loss sharing mechanisms within a predominantly conventional civil-law banking environment.

Recent analyses underscore that effective risk management will determine whether Uzbekistan's Islamic banking experiment succeeds in mobilizing previously untapped domestic savings and attracting substantial foreign direct investment from Gulf and Southeast Asian partners. The absence of mature secondary markets for Shariah-compliant instruments, combined with limited expertise in asset valuation and contract enforcement, heightens exposure to liquidity and operational disruptions during the initial rollout phase. Moreover the planned coexistence of Islamic windows within conventional banks creates hybrid governance challenges that demand sophisticated separation of funds and risk silos. Without robust mitigation strategies these transitional frictions could undermine depositor confidence and slow the sector's contribution to broader financial inclusion objectives.

Consequently a comprehensive examination of both challenges and practical solutions has become essential for supporting evidence-based policymaking at this pivotal juncture.

The present study aims to fill this analytical gap by providing a detailed assessment of risk management impediments and corresponding remedies tailored to Uzbekistan's post-2026 regulatory reality. Employing a qualitative approach grounded in official Central Bank documents, IFSB stability reports, and comparative case studies from other civil-law jurisdictions, the research systematically dissects Shariah compliance, liquidity, operational, and emerging climate-related risks. Its primary contribution lies in articulating an integrated supervisory architecture that aligns international standards with local institutional capacities while anticipating the 2030 expansion targets. By doing so the article offers actionable insights for regulators, financial institutions, and international development partners seeking to ensure that Uzbekistan's Islamic banking sector develops on a sound and sustainable foundation.

Uzbekistan's recent legislative breakthrough in Islamic banking reflects a deliberate policy shift toward diversifying financial services and deepening capital market integration. The 2026 law introduces separate licensing provisions for fully fledged Islamic banks alongside permissive Islamic windows in existing institutions, thereby creating a dual-track architecture that balances innovation with prudential caution. This framework necessitates immediate attention to risk governance because conventional supervisory tools were never designed to accommodate profit-sharing or asset-backed structures. Early implementation experiences from similar hybrid models elsewhere reveal that inadequate segregation of Islamic and conventional balance sheets can propagate contagion risks across the broader banking system. Therefore establishing dedicated risk committees within each participating institution represents a foundational requirement for the 2027 launch.

A particularly pressing concern involves the independence and operational effectiveness of Shariah supervisory boards under the new law. Although the Central Bank plans to create a national Shariah Advisory Council, questions remain regarding its authority to enforce binding rulings across both windows and standalone entities. In the absence of clear enforcement mechanisms subtle divergences in fatwa interpretation could erode market confidence and invite regulatory arbitrage. Comparative evidence from jurisdictions that successfully harmonized multiple Shariah opinions demonstrates the value of mandatory pre-approval protocols for all product structures. Uzbekistan's regulators would therefore benefit from adopting similar standardized review processes before any window becomes operational. Such measures would substantially reduce Shariah non-compliance exposure during the critical scaling phase through 2030.

Liquidity risk assumes heightened significance in Uzbekistan's Islamic banking context because of the heavy reliance on real-asset financing and the still-nascent state of local sukuk markets. Conventional liquidity coverage ratios cannot be applied directly to profit-sharing deposits that lack fixed-return guarantees, forcing institutions to develop alternative stress-testing methodologies. The Central Bank's forthcoming roadmap must therefore incorporate dedicated Islamic liquidity facilities backed by high-quality sovereign sukuk once issuance commences. Without these instruments participating banks may face acute mismatches between long-term ijara portfolios and short-term withdrawal demands from investment account holders. Proactive calibration of liquidity buffers calibrated to local economic cycles will prove essential for maintaining systemic stability.

Operational risks multiply during the transition period when staff must simultaneously manage conventional and Islamic portfolios within the same institution. Training programs announced in partnership with INCEIF represent a positive step yet require supplementation with scenario-based simulations that replicate real-time Shariah compliance failures. Documentation workflows for murabaha and musharaka contracts demand entirely new digital templates to prevent errors that could later trigger costly restructuring. Furthermore internal audit functions must be restructured to include specialized Shariah auditors capable of verifying both financial and religious compliance. These operational enhancements will determine whether Islamic windows achieve seamless integration or instead become sources of reputational vulnerability.

Human capital constraints constitute perhaps the most binding limitation on rapid sector development. Despite the Central Bank's project office and planned certification pathways the pool of qualified Shariah scholars and risk managers familiar with Uzbekistan's civil code remains extremely small. Recruitment from established markets such as Turkey and Malaysia offers only a temporary bridge because cultural and legal nuances require localized expertise. Long-term solutions must therefore emphasize university-level curriculum reform and mandatory continuing professional development for existing bankers. Without accelerated talent pipelines the ambitious target of ten Islamic banks by 2030 risks being undermined by governance weaknesses rather than market demand shortfalls.

Fintech integration presents both opportunities and novel risks for Uzbekistan's emerging Islamic banking ecosystem. The country's existing blockchain and cryptocurrency regulatory sandbox provides a ready foundation for deploying smart-contract versions of mudaraba and wakala agreements. However such innovations introduce cyber-security and smart-contract audit risks that traditional supervisory frameworks are ill-equipped to address. Collaboration with regional fintech hubs could accelerate the development of Shariah-compliant regtech solutions capable of real-time compliance monitoring. At the same time regulators must establish clear guidelines on data privacy and algorithmic transparency to prevent technology-driven Shariah breaches. A balanced approach to digital transformation will enable Uzbekistan to leapfrog legacy systems while safeguarding financial integrity.

Climate and environmental risks are gaining prominence within global Islamic finance discourse and Uzbekistan's agricultural and energy sectors make this dimension especially relevant. Green sukuk structures could channel financing toward sustainable irrigation and renewable projects yet require sophisticated environmental risk assessment capabilities currently absent in local institutions. The Central Bank's roadmap should therefore incorporate mandatory climate stress testing for all Islamic financing above certain thresholds. International technical assistance from IsDB and IFSB working groups on sustainable finance would accelerate capacity building in this area. Integrating ESG considerations into core risk management will not only mitigate physical and transition risks but also enhance the sector's appeal to ethical investors from the Gulf Cooperation Council.

Comparative analysis with Turkey's recent Islamic finance expansion offers instructive parallels for Uzbekistan. Turkish authorities successfully navigated civil-law adaptation by creating dedicated Islamic banking subsidiaries rather than windows, thereby achieving clearer risk ring-fencing. Uzbekistan could adapt this model selectively for larger state-owned banks while retaining windows for smaller institutions seeking gradual entry. Pakistan's experience with centralized Shariah boards also merits examination particularly its mechanisms for resolving interpretive disputes across

institutions. Selective adoption of these proven practices would allow Uzbekistan to avoid common pitfalls observed in other frontier markets.

The planned 2030 expansion trajectory demands proactive macroprudential oversight to prevent excessive concentration in real-estate or commodity-linked financing. Diversification mandates embedded within licensing conditions could encourage broader sectoral coverage including manufacturing and export-oriented SMEs. At the same time the deposit insurance scheme must be extended to profit-sharing investment accounts on a risk-adjusted basis to maintain competitive parity with conventional deposits. These complementary measures would reinforce overall financial stability while supporting the government's financial inclusion objectives.

Supervisory technology platforms represent another critical enabler for effective risk oversight in the new environment. The Central Bank should prioritize development of a unified Islamic finance reporting dashboard that aggregates data across windows and full banks in real time. Artificial intelligence-driven anomaly detection could flag potential Shariah deviations or liquidity breaches before they escalate. Initial investment in such infrastructure although substantial would yield long-term dividends in supervisory efficiency and crisis preparedness. Regional cooperation within the IFSB framework could facilitate cost-sharing and knowledge transfer for these digital initiatives.

Corporate governance arrangements must evolve to reflect the dual fiduciary responsibilities inherent in Islamic banking. Boards of directors require specialized committees that jointly oversee financial performance and Shariah adherence with clearly defined escalation protocols to the national advisory council. Independent non-executive directors with Islamic finance expertise should be mandated for all licensed entities to strengthen oversight. These governance enhancements would align decision-making processes more closely with the ethical foundations of the industry and reduce agency problems that frequently arise in profit-sharing arrangements.

Tax neutrality provisions within the 2026 law constitute a significant enabler yet their practical implementation will require careful calibration to avoid unintended risk concentrations. Double taxation risks on murabaha mark-ups or musharaka profit distributions must be eliminated through precise amendments to the Tax Code. At the same time regulators should monitor whether tax incentives inadvertently encourage excessive leverage in certain asset classes. Continuous dialogue between the Central Bank, Ministry of Finance, and industry participants will be necessary to maintain an optimal balance between competitiveness and prudential soundness.

Public awareness campaigns will play a decisive role in shaping depositor behavior and managing reputational risks during the initial rollout. Many potential customers still harbor misconceptions regarding the risk-return profile of Islamic accounts compared with conventional deposits. Targeted educational programs delivered through mosques, universities, and digital channels could clarify the equity-based nature of investment accounts and associated risk-sharing principles. Transparent communication of historical performance data from pilot projects would further build confidence. Effective awareness initiatives would reduce the likelihood of sudden withdrawal pressures triggered by market volatility or isolated compliance incidents.

International partnerships offer valuable avenues for accelerating risk management capabilities. The memorandum of understanding with INCEIF provides a platform for curriculum development and executive training programs tailored to Uzbek conditions. Similarly technical cooperation with the Islamic Development Bank could facilitate pilot testing of standardized risk-weighting methodologies

for local asset classes. These collaborative efforts would compress the learning curve and help Uzbekistan avoid costly trial-and-error experiences observed in other emerging markets. Strategic engagement with global standard-setters will also enhance the country's credibility with international investors.

The interaction between conventional and Islamic segments within hybrid institutions deserves particular regulatory attention. Firewalls separating capital, liquidity, and operational resources must be robust enough to prevent spillover effects while remaining operationally efficient. Regular joint stress tests involving both segments would reveal hidden interdependencies and inform contingency planning. Over time the Central Bank may consider requiring separate capital adequacy calculations for Islamic windows to reflect their distinct risk profiles more accurately. Such graduated supervisory measures would support orderly growth without imposing prohibitive compliance costs on smaller banks.

Emerging risks associated with cross-border Islamic transactions warrant inclusion in the national supervisory agenda. As Uzbek Islamic banks begin attracting deposits or investment from Gulf investors currency mismatch and correspondent banking risks will intensify. Developing Shariah-compliant hedging alternatives that comply with both local regulations and international standards represents a complex but necessary undertaking. Participation in regional liquidity management facilities such as those coordinated by the International Islamic Liquidity Management Corporation could provide a partial solution. Forward-looking regulatory preparedness in this domain will safeguard against external shocks.

Performance measurement frameworks for Islamic banks must transcend conventional return-on-equity metrics to incorporate risk-sharing and social impact indicators. The Central Bank should pilot a balanced scorecard approach that evaluates not only financial soundness but also adherence to maqasid al-Shariah principles. Disclosure requirements for such metrics would enable market discipline to complement regulatory oversight. Over time standardized reporting would facilitate benchmarking across institutions and support evidence-based policy adjustments.

The role of microfinance institutions in extending Islamic finance to rural and underserved segments introduces additional risk layers related to small-ticket financing and limited collateral options. Specialized regulatory sandboxes could allow testing of group-based musharaka and qard hasan models under controlled conditions. Lessons learned from these experiments would inform scaled rollout while containing potential losses. Integration of micro-Islamic finance within the broader risk management framework would enhance overall financial inclusion without compromising systemic stability.

Finally continuous monitoring of global Islamic finance developments remains essential for maintaining Uzbekistan's regulatory agility. The IFSB Stability Report 2025 highlights evolving challenges around hybrid capital instruments and fintech-driven disintermediation that could soon affect local institutions. Regular gap analyses comparing domestic standards against updated international guidance will help preempt regulatory lag. Institutionalizing such forward-looking reviews within the Central Bank's Islamic finance project office would embed adaptability into the supervisory culture from the outset.

Conclusion

The enactment of Uzbekistan's Islamic banking law in 2026 marks a historic milestone that opens substantial opportunities for financial diversification and inclusive growth. However the transition phase through 2030 will test the country's ability to design and implement risk management systems capable of addressing novel Shariah, liquidity, and operational challenges within a hybrid regulatory environment. Success will hinge on proactive collaboration between the Central Bank, financial institutions, and international partners to build institutional capacity and technological infrastructure before full-scale expansion.

Four principal conclusions emerge from the analysis. First, Shariah governance arrangements must achieve genuine operational independence to preserve market confidence during the critical launch period. Second, liquidity risk frameworks require bespoke instruments and stress-testing methodologies that account for the unique characteristics of profit-sharing deposits and asset-backed financing. Third, human capital development through sustained educational partnerships represents the foundational prerequisite for sustainable sector growth. Fourth, digital risk monitoring platforms combined with adaptive prudential standards will enable Uzbekistan to leapfrog traditional development stages and establish a resilient Islamic banking ecosystem aligned with international best practices.

Recommendations

1. Establish a dedicated Islamic Finance Risk Laboratory within the Central Bank by mid-2026 to conduct joint stress tests with participating banks and develop Uzbekistan-specific liquidity and Shariah risk models ahead of the 2027 launch.
2. Mandate compulsory certification programs in partnership with INCEIF for all Shariah board members and senior risk officers, targeting full coverage across pilot institutions before any Islamic window commences operations.
3. Introduce mandatory climate-risk disclosure requirements for all Islamic financing facilities exceeding USD 5 million, integrated into the supervisory reporting dashboard to align with global sustainable finance trends.
4. Develop and pilot a unified digital compliance platform using blockchain for contract verification and real-time Shariah monitoring, with mandatory adoption by all licensed entities by the end of 2028 to support the 2030 expansion targets.

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GRAFIK DIZAYN TA'LIMIDA CORELDRAW VA PHOTOSHOPDAN FOYDALANISHNING PEDAGOGIK AHAMIYATI

Qashqadaryo Pedagogika Texnikumi,
Kompyuter grafikasi va dizayn
operatori yo'nalishida maxsus
fanlar o'qituvchilari

Yoqubova Gavhar Bahodir qizi
Rustamov Shaxzod Ziyodulla o'g'li

Annotatsiya

Mazkur maqolada grafik dizayn ta'limida zamonaviy raqamli vositalardan foydalanishning pedagogik ahamiyati tahlil qilinadi. Xususan, vektorli va raster grafika bilan ishlash imkonini beruvchi **Corel** tomonidan ishlab chiqilgan CorelDRAW hamda **Adobe** platformasiga mansub Photoshop dasturlarining o'quv jarayonidagi didaktik, metodik va kompetensiyaviy imkoniyatlari o'rganiladi. Tadqiqotda talabalarning ijodiy tafakkuri, vizual savodxonligi, texnologik ko'nikmalari va mustaqil loyihalash qobiliyatlarini rivojlantirishda ushbu dasturlarning o'rni yoritiladi. Natijada grafik dizayn ta'limini samarali tashkil etish bo'yicha metodik tavsiyalar ishlab chiqiladi.

Kalit so'zlar

grafik dizayn, CorelDRAW, Photoshop, pedagogik texnologiyalar, vizual savodxonlik, ijodiy tafakkur, raqamli ta'lim

Аннотация

В статье анализируется педагогическое значение использования современных цифровых инструментов в обучении графическому дизайну. Рассматриваются дидактические и методические возможности программ CorelDRAW и Photoshop в развитии творческого мышления, визуальной грамотности и профессиональных компетенций студентов. Предлагаются рекомендации по эффективной организации учебного процесса.

Ключевые слова

графический дизайн, CorelDRAW, Photoshop, педагогические технологии, визуальная грамотность, цифровое обучение

Abstract

This paper examines the pedagogical significance of integrating digital tools into graphic design education. It evaluates the didactic and methodological potential of CorelDRAW and Photoshop in fostering creative thinking, visual literacy, and

professional competencies. The study proposes strategies for effective instructional design within digital learning environments.

Keywords

graphic design, CorelDRAW, Photoshop, pedagogical technologies, visual literacy, digital education

KIRISH

Zamonaviy ta'lim tizimi axborot-kommunikatsiya texnologiyalari bilan uzviy bog'liq holda rivojlanmoqda. Raqamli vositalar nafaqat bilim yetkazish mexanizmlarini, balki o'quv faoliyatining mazmuni va metodikasini ham tubdan o'zgartirdi. Ayniqsa, grafik dizayn kabi vizual va ijodiy yo'nalishlarda dasturiy vositalarning ahamiyati beqiyosdir. Dizayn ta'limi an'anaviy chizmachilik va kompozitsiya asoslariga tayanib kelgan bo'lsa-da, bugungi kunda vektorli va raster grafikani chuqur o'zlashtirish zarurati yuzaga kelmoqda.

CorelDRAW va Photoshop dasturlari grafik dizayn sohasida eng keng qo'llaniladigan platformalar qatoriga kiradi. Ushbu dasturlar orqali talabalar vizual obraz yaratish, rang bilan ishlash, tipografiya, kompozitsiya va brending asoslarini amaliy jihatdan o'zlashtirish imkoniyatiga ega bo'ladilar. Shu bois, ularning pedagogik imkoniyatlarini ilmiy asosda tahlil qilish muhim vazifaga aylanadi.

Mazkur maqolaning maqsadi grafik dizayn ta'limida CorelDRAW va Photoshop dasturlaridan foydalanishning pedagogik ahamiyatini ochib berish, ularning didaktik imkoniyatlari va metodik samaradorligini tahlil qilishdan iborat.

Asosiy qism

Bugungi mehnat bozori kreativ fikrlash, vizual kommunikatsiya va raqamli texnologiyalar bilan ishlash ko'nikmalariga ega mutaxassislarni talab etadi. Grafik dizayn ta'limi faqat nazariy bilim berish bilan cheklanmay, balki amaliy, loyiha asosidagi faoliyatni ham qamrab olishi zarur. Talabalar dizayn jarayonida g'oya ishlab chiqish, vizual konsepsiya yaratish, texnik vositalardan foydalanish va yakuniy mahsulot tayyorlash bosqichlarini o'zlashtirishlari lozim.

Shu nuqtai nazardan, raqamli grafik dasturlar o'quv jarayonining ajralmas qismiga aylanadi. CorelDRAW vektorli grafika yaratishda aniqlik, masshtablash va poligrafik tayyorgarlik imkoniyatlari bilan ajralib turadi. Photoshop esa raster tasvirlarni qayta ishlash, retush, rang korreksiyasi va vizual effektlar yaratishda yetakchi vosita hisoblanadi.

CorelDRAW dasturining pedagogik imkoniyatlari. CorelDRAW grafik dizayn ta'limida vektorli tafakkurni shakllantirishga xizmat qiladi. Talabalar obyektga

yo‘naltirilgan dizayn, shakl va chiziqlar bilan ishlash, kompozitsion muvozanatni saqlash, tipografik yechimlar ishlab chiqish kabi ko‘nikmalarni egallaydilar.

Dastur muhitining intuitiv interfeysi talabalarga ijodiy jarayonga tez kirishish imkonini beradi. Vektorli obyektlar bilan ishlash aniqlik va moslashuvchanlikni ta‘minlab, dizayn mahsulotlarining sifatini oshiradi. Bu jarayonda talabalar nafaqat texnik, balki estetik qarorlar qabul qilishni ham o‘rganadilar.

CorelDRAW orqali logotip, vizitka, banner, illyustratsiya va turli brending elementlarini yaratish o‘quvchilarning vizual fikrlashini rivojlantiradi. Shuningdek, qatlamlar bilan ishlash, rang modellarini tanlash va kompozitsiya qurish dizayn madaniyatini shakllantiradi.

Photoshop dasturining ta‘limiy ahamiyati. Photoshop raster tasvirlar bilan ishlash orqali vizual idrok va rang sezgisini rivojlantiradi. Talabalar fotosuratlarini tahrirlash, yorug‘lik va soyani boshqarish, tekstura va effektlar qo‘llash orqali realistik hamda konseptual tasvirlar yaratadilar.

Photoshop bilan ishlash jarayoni tasvirni tahlil qilish, detallarni ajratish va vizual muammolarni hal qilish kompetensiyalarini shakllantiradi. Bu esa talabalarni kreativ va tanqidiy fikrlashga undaydi.

Dasturdagi retush, maska, filtr va rang korreksiyasi vositalari talabalarning texnologik savodxonligini oshiradi. Shu bilan birga, tasvir estetikasi va vizual hikoya yaratish qobiliyati rivojlanadi.

Ijodiy tafakkur va vizual savodxonlikni rivojlantirish. Grafik dizayn ta‘limida asosiy maqsadlardan biri talabaning ijodiy tafakkurini rivojlantirishdir. CorelDRAW va Photoshop dasturlari orqali talabalar g‘oyani vizual shaklga keltirish jarayonida eksperiment qilish, alternativ yechimlar izlash va muammoga kreativ yondashish imkoniga ega bo‘ladilar.

Vizual savodxonlik esa rang, shakl, kompozitsiya va tipografiya elementlarini anglash va qo‘llash qobiliyatini anglatadi. Raqamli dasturlar ushbu kompetensiyani shakllantirishda samarali vosita bo‘lib xizmat qiladi.

Pedagogik texnologiyalar bilan integratsiya. CorelDRAW va Photoshop dasturlaridan foydalanish interfaol va loyiha asosidagi ta‘lim metodlari bilan uyg‘unlashadi. Talabalar mustaqil loyiha bajarish, guruhviy dizayn ishlari, portfel yaratish kabi faoliyatlar orqali kasbiy kompetensiyalarini rivojlantiradilar.

O‘qituvchi esa fasilitator rolini bajarib, ijodiy jarayonni yo‘naltiradi, maslahat beradi va baholash mezonlarini ishlab chiqadi. Natijada ta‘lim jarayoni talabaga yo‘naltirilgan model asosida tashkil etiladi.

Kasbiy kompetensiyalarni shakllantirish. Grafik dasturlar bilan ishlash texnik ko'nikmalar bilan birga, dizayn tafakkuri, muammoli vaziyatlarni hal qilish, vizual kommunikatsiya va prezentatsiya madaniyatini ham rivojlantiradi.

Talabalar real loyihalar ustida ishlash orqali bozor talablari, mijoz bilan muloqot va kreativ strategiya ishlab chiqish tajribasiga ega bo'ladilar.

Xulosa

CorelDRAW va Photoshop dasturlaridan grafik dizayn ta'limida foydalanish talabalarning ijodiy tafakkuri, vizual savodxonligi va kasbiy kompetensiyalarini rivojlantirishda muhim omil hisoblanadi. Ushbu vositalar nazariya va amaliyotni uyg'unlashtirib, ta'lim samaradorligini oshiradi.

Raqamli grafik dasturlar bilan ishlash nafaqat texnologik savodxonlik, balki estetik tafakkur va kreativ fikrlashni ham shakllantiradi. Shu bois, grafik dizayn ta'limida zamonaviy dasturiy vositalarni integratsiya qilish strategik ahamiyat kasb etadi.

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**O‘ZBEKISTONDA KICHIK BIZNESNI MOLIYALASHTIRISH VA
QO‘LLAB-QUVVATLASH TIZIMINI TAKOMILLASHTIRISH
MASALALARI**

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Annotatsiya: Ushbu maqolada mamlakatimizda olib borilayotgan iqtisodiy islohotlar orqali iqtisodiyotning barqaror o‘sishi, kichik va o‘rta biznesning o‘rni, mamlakatimizda uni rivojlantirish uchun yaratilayotgan yangi imkoniyatlar va davlat tomonidan qo‘llab quvvatlanishi bayon etilgan.

Kalit so‘zlar: Tadbirkorlik, kichik biznes, o‘rta biznes, iqtisodiy islohotlar, oilaviy tadbirkorlik, makroiqtisodiy ko‘rsatkichlar, aholi bandligi.

Milliy iqtisodiyotda muhim o‘rin egallab borayotgan kichik biznes va xususiy tadbirkorlik sohasini yanada rivojlantirish hamda bu orqali ichki bozorni raqobatbardosh, sifatli va eksportbop mahsulotlar bilan to‘ldirish, yangi ish o‘rinlari yaratish hamda buning asosida aholi daromadlarini ko‘paytirish va barqaror iqtisodiy o‘sishni ta‘minlash borasida ahamiyatga molik ishlar amalga oshirilmoqda.

Shu bilan bir qatorda, bu soha davlat byudjetiga soliq to‘lov tushumlari hajmining ko‘payishi va iqtisodiy rivojlanishning asosiy ko‘rsatkichi hisoblangan yalpi ichki mahsulot salmog‘ining o‘shishiga asosiy turtki bo‘lmoqda.

Kichik biznes va xususiy tadbirkorlik faoliyati jamiyatimizdagi ijtimoiy, iqtisodiy va siyosiy barqarorlikning tayanchiga hamda asosiy kuchiga aylanib bormoqda.

Hozirgi kunda respublikamizda kichik biznes va xususiy tadbirkorlik faoliyatini rivojlantirishga alohida e‘tibor berilmoqda. Chunki, kichik biznes va xususiy tadbirkorlik sohasini rivojlantirish masalasiga davlatimiz iqtisodiy siyosatining strategik vazifasi sifatida qaralmoqda. Kichik biznes kapital taqchilligi sharoitida ko‘p mablag‘ talab etmaydigan xo‘jalik faoliyati sifatida resurslar aylanmasining yuqori sur‘atlarini ta‘minlaydi, iqtisodiyotni qayta qurish, iqtisodiy nobarqarorlik va resurslar cheklanganligi sharoitida iste‘mol bozorini shakllantirish va uni to‘ldirish

muammosini tez hamda tejamli tarzda hal etadi. Kichik korxonalar iste'mol talabining o'zgarishiga darhol moslashadi va shu yo'l bilan iste'mol bozoridagi zaruriy muvozanatni ta'minlaydi.

Hozirgi paytda ushbu soha nafaqat iqtisodiyotning o'sish sur'atlarini jadallashtirishda, balki mamlakatimiz uchun nihoyatda muhim bo'lgan bandlik va aholi daromadlarini oshirish masalalarini hal etishda ham yetakchi o'rin tutmoqda.

Oxirgi yillarda respublikamizda kichik biznes va xususiy tadbirkorlik bilan shug'ullanuvchi korxonalar soni yil sayin ortib borayotgani sohaning izchil rivojlanayotganligidan dalolat beradi. Bu narsa shu bilan bog'liqki, kichik biznes tizimi ichida mukammal taqsimot tizimining yaratilishi natijasida markazlashgan va rezerv fondlarining tashkil etilishi orqali kengaytirilgan takror ishlab chiqarish imkoniyatlarining yanada mustahkamlanishiga erishish hamda turli soliq imtiyozlarining qo'llanilishi maqsadida kichik biznes kelgusi taraqqiyoti uchun qulay iqtisodiy sharoitlar yaratiladi.

Kichik biznes va xususiy tadbirkorlikning aholini ish bilan band etishi va o'rta sinfni shakllantirishi kabi xususiyatlari xorijiy iqtisodiy adabiyotlarda batafsil yoritilgan. Rivojlangan mamlakatlar tajribasidan ma'lumki, kichik korxonalar iqtisodiy rivojlanish, ilmiy-texnika ixtirolarini, aholining talabini qondirish uchun qo'llashda istiqbollidir.

Boshqarish sohasida kichik korxonalarda eng kam xarajat qilinishi bilan birga mulk haqiqiy egasining qo'lida bo'lib, undan foydalanish, ko'paytirish doimo yaxshi natijalarga olib kelgan.

Kichik biznes subyektlarining to'la erkinligini ta'minlash va ular faoliyatini rag'batlantirish lozim. Jahon iqtisodiyotida kichik biznes ijtimoiy-iqtisodiy muammolarni hal etishda, yangi ish o'rinlarini barpo qilishda, bozor o'zgarishlariga nisbatan tez moslashishda va mulkdorlar sinfini shakllantirishda alohida ahamiyatga va yuqori samaradorlikka ega ekanligi tasdiqlanmoqda.

Bir qator mamlakatlarda kichik biznesning iqtisodiyotda tutgan o'rniga, uning tadbirkorlikni rivojlantirishdagi va bozor munosabatlarini shakllantirishdagi ahamiyatiga alohida e'tibor berilmoqda. Shu nuqtai-nazardan bozor iqtisodiyoti rivojlangan mamlakatlarning kichik biznesni moliyalashtirish yuzasidan tajribalarini atroflicha o'rganish va samarali bo'lgan usullarni milliy iqtisodiyotning xususiyatlarini hisobga olgan holda joriy qilish bosh masaladir. Bu esa, o'z navbatida, O'zbekistonda kichik biznes loyihalarini moliyalashni takomillashtirishga ham xizmat qiladi.

Respublikamizning iqtisodiy taraqqiyoti, iqtisodiy mustaqilligi, xalqining faravon turmush darajasi, qolaversa mehnat resurslarining ish bilan bandlik darajasi kichik

biznes va xususiy tadbirkorlikning rivoji bilan bog'liqdir. Bu holat esa korxonalarning iqtisodiy erkinligini rag'batlantirish darajasi rivojlanishi bilan tavsiflanadi. Istiqbolda iqtisodiyot tarmoqlarida ham o'zgarishlar yuzaga keladi. Bu holat ham kichik tadbirkorlikning rivojlanishi asosida ro'y beradi.

Respublikamizda kichik korxonalar tomonidan tayyor mahsulotlar ishlab chiqarishning o'sishini yaratilgan imkoniyatlardan faollik bilan foydalanish evaziga ta'minlash mumkin.. Milliy iqtisodiyotning raqobatbardoshligi iqtisodiy faoliyat jarayonlari va uning natijalarini aks ettiruvchi ko'rsatkichlarda kichik biznes ulushining yuqori bo'lishiga ham bog'liq ekanligi shubhasizdir. Kam xarajat hisobiga yangi ish o'rinlari yaratish imkoniyati, yirik biznes kirib bora olmaydigan bozor segmentlarini egallay olish qobiliyati, ayniqsa, xizmat ko'rsatish sohasi va uncha katta bo'lmagan mahalliy resurs bazalarini o'zlashtirishda juda qulay tashkiliy shakl ekanligi kichik biznesni rivojlantirishning ahamiyati beqiyosligini ko'rsatadi. Shu sababli ham kichik biznesni jadal rivojlantirish masalasi mahsulot ishlab chiqarishni mahalliyashtirish, xizmat ko'rsatish sohasini rivojlantirish, shuningdek, mamlakatning eksport salohiyatini oshirish masalalari bilan chambarchas bog'langan. Ta'kidlash joizki, kichik biznesda tadbirkorlik faolligini oshirish uchun quyidagi umumiy sharoitlar ta'minlashi zarur:

- milliy iqtisodiyotda makroiqtisodiy muvozanatni ta'minlash negizida uni barqaror rivojlanishini ta'minlash;
- iqtisodiyotda raqobat muhiti shakllanishini ta'minlash;
- kichik biznesni davlat tomonidan qo'llab-quvvatlash tizimi, uning mexanizmlarini takomillashtirish asosida rivojlantirib borish;
- kichik biznesga xizmat ko'rsatuvchi infertuzulmalarni samarali harakat qilishini ta'minlash.

O'zbekiston Respublikasida kichik biznes faoliyatini rivojlantirishning asosiy yo'nalishlari quyidagilardan iborat:

- kichik biznesning huquqiy-me'yoriy va tashkiliy asoslarini iqtisodiyotda turli omillar ta'sirida ro'y berayotgan o'zgarishlarga mos ravishda uzluksiz takomillashtirib borish;
- davlat tomonidan kichik biznes va huquqiy tadbirkorlikni qo'llab-quvvatlash mexanizmlarini samaradorligini oshirish, bu borada xorijiy mamlakatlar tajribasidagi yangi mexanizmlarni mavjud sharoitlarga moslashtirgan holda amaliyotga qo'llash;
- kichik biznesning innovatsiya negizida rivojlanishini ta'minlash borasida chora - tadbirlarni ishlab chiqish;

-kichik biznesni moliyaviy jihatdan ta'minlash mavjud mexanizmlar samaradorligini oshirish va moliyalashtirishning yangi manbalarini harakatga keltirish negizida qulay investitsiya muhitini yaratish;

-kichik biznesda ishlab chiqarishni tashkil etishning moddiy ta'minotini takomillashtirish;

-kichik biznesni tashqi iqtisodiy faoliyat mexanizmlarini takomillashtirish;

-kichik biznes sohasi uchun malakali raqobatbardosh kadrlarni tayyorlash;

-kichik biznesda kooperatsiyani chuqurlashtirish.

Kichik biznesni ushbu yo'nalishlarda olib boriladigan chora-tadbirlarni ishlab chiqishda kichik biznesni rivojlantirish borasida xorijiy tajribani o'rganish va uni mamlakatimiz sharoitlariga tatbiq etish muhimdir.

Kichik biznes subyektlarining tashqi iqtisodiy aloqalarga kirishishida savdo vositachilari ko'mak beradi, hamda hamkorlar va xaridor topishga dastlabki imkoniyat yaratiladi. Kichik biznesning mamlakat iqtisodiyotida tutgan o'rnidan kelib chiqqan holda va ushbu sohada sifat o'zgarishlariga erishish uchun dasturning bosh maqsadi: kichik biznes sohasini kengaytirish va samaradorligini oshirish asosida ushbu sektorni barcha tomonidan e'tirof etilgan vazifalarini to'liq bajarishni ta'minlash va rivojlantirishida yangi sifat bosqichiga o'tishini ta'minlashdan iborat.

Aholi boshiga to'g'ri keladigan kichik biznes subyektlari soni 2025 yilda 32,1 ta / 1000 kishiga teng bo'ldi, eng yuqori ko'rsatkichlar Xorazm, Toshkent shahrida kuzatildi.

Tadbirkorlarning ko'pchiligi savdo sohasida faoliyat yuritadi — bu sektorda korxonalar ulushi 32–38 % atrofida.

Mamlakatdagi faol korxonalar va tashkilotlarning 85 % dan ortig'i kichik korxonalar va mikrofirmalardir.

Kichik biznes tadbirkorlik faoliyatini oshirishda davlat tomonidan qo'llab-quvvatlash samarasini oshirish maqsadida dasturda ushbu yo'nalish quyidagilarni amalga oshirishi lozim:

- Uzoq muddatli va past foizli kreditlar hajmini oshirish;
- Garov ta'minotsiz kreditlash mexanizmlarini rivojlantirish;
- Kredit kafilligi jamg'armalari faoliyatini kuchaytirish;
- Yangi tashkil etilgan kichik korxonalar uchun "soliq ta'tili" amaliyotini kengaytirish;
- Innovatsion grantlar ajratish;
- Oliy ta'lim muassasalarida "Biznes boshqaruvi" yo'nalishlarini amaliyot bilan integratsiya qilish;

- Moliyaviy savodxonlik dasturlarini kengaytirish.

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METAPHOR AND ITS FUNCTION IN LINGUISTICS: A COGNITIVE, SEMANTIC, AND PRAGMATIC EXPLORATION WITH REFERENCE TO THE LEXEME *HONESTY*

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Abstract

Metaphor occupies a central position in contemporary linguistic theory, not merely as a rhetorical ornament but as a fundamental mechanism of conceptualization and meaning construction. Modern research in cognitive linguistics has demonstrated that metaphor structures human thought, organizes abstract domains, and shapes discourse practices. This article provides an expanded theoretical discussion of metaphor from semantic, cognitive, pragmatic, and cultural perspectives. Special attention is devoted to the metaphorical structuring of the lexeme honesty, illustrating how moral abstraction becomes cognitively accessible through embodied and culturally embedded source domains such as light, cleanliness, straightness, and solidity. The study argues that metaphor performs constitutive functions in linguistic representation and moral cognition.

Keywords: metaphor, conceptual metaphor, cognitive linguistics, semantic field, honesty, moral concepts, discourse analysis.

INTRODUCTION

For a long time, metaphor was treated primarily as a stylistic or rhetorical device associated with poetry and literary creativity. Classical rhetoric considered metaphor a figure of speech based on similarity between two entities. However, developments in modern linguistics, especially within cognitive linguistics, radically transformed this perspective. The publication of *Metaphors We Live By* by George Lakoff and Mark Johnson established the idea that metaphor is not peripheral to language but central to thought itself. According to this view, metaphor is a conceptual mechanism that enables individuals to understand abstract domains through more concrete and embodied experiences.

Metaphor operates by mapping knowledge from a familiar source domain onto a more abstract target domain. This process is systematic rather than accidental, reflecting patterns grounded in bodily experience, cultural models, and social interaction. Abstract moral concepts, such as *honesty*, provide a particularly productive field for metaphorical analysis. Because moral values cannot be directly perceived, language relies on metaphorical projection from physical experience to conceptualize them. The lexeme *honesty* exemplifies how metaphor shapes ethical cognition. Through metaphorical constructions, honesty becomes visible, tangible, spatially oriented, and materially structured. Expressions such as “clean conscience,” “transparent honesty,” “upright character,” and “rock-solid integrity” demonstrate how embodied imagery provides structure to moral abstraction.

The Nature of Metaphor in Linguistic Theory

Contemporary linguistic approaches regard metaphor as a conceptual phenomenon embedded in the cognitive system. Within cognitive linguistics, metaphor is understood as a mapping between domains, where structural correspondences allow speakers to reason about abstract concepts through embodied schemas. This perspective challenges the traditional ornamental view of metaphor by asserting that everyday reasoning itself is metaphorically structured. From a semantic standpoint, metaphor contributes to polysemy and lexical extension. Words expand their semantic range by participating in metaphorical constructions. The lexeme *honesty*, for example, extends beyond its basic definition of “truthfulness” to acquire metaphorical dimensions associated with clarity, purity, strength, and elevation. Such semantic enrichment demonstrates that metaphor is central to lexical development and conceptual organization. In discourse analysis, metaphor functions as a persuasive and evaluative instrument. Political, ethical, and institutional discourses frequently rely on metaphor to construct legitimacy and moral authority. When public figures speak of “transparent governance” or “a foundation of honesty,” they draw upon metaphorical mappings that present ethical behavior as visible, stable, and structurally sound. These metaphorical models shape ideological framing and social perception.

Structural Metaphor and Moral Conceptualization

Structural metaphors allow one conceptual domain to be organized through the structure of another. In the case of *honesty*, structural mappings frequently draw from domains such as cleanliness, light, straightness, and solidity. These source domains are concrete and perceptually accessible, making them effective tools for conceptualizing moral values. When speakers use expressions such as “a spotless reputation” or “clean hands,” moral integrity is structured through the concept of physical cleanliness. Dirt

and stain metaphorically represent moral corruption, while washing or purification symbolize moral restoration. This mapping reflects embodied experiences in which cleanliness is associated with health, order, and acceptability. Similarly, the metaphor “*honesty is light*” structures moral truthfulness through visual perception. Expressions like “*the light of truth*,” “*honesty shines through*,” and “*a bright moral character*” conceptualize honesty as illumination. Light enables vision and clarity; therefore, moral clarity is understood as a state of illumination. Darkness, by contrast, symbolizes deception or concealment. These metaphors are deeply rooted in embodied human experience, where vision is the dominant sensory modality for acquiring knowledge. Another structural mapping conceptualizes honesty through straightness and vertical alignment. Phrases such as “a straight answer,” “upright citizen,” and “straightforward person” rely on spatial orientation. Straight lines are associated with directness and correctness, whereas crookedness suggests deviation and dishonesty. Verticality further reinforces moral evaluation: standing upright symbolizes dignity and moral integrity, while falling or bending may imply moral weakness.

Ontological and Material Metaphors of Honesty

Ontological metaphors conceptualize abstract entities as objects, substances, or containers. In everyday discourse, honesty is frequently treated as something that can be possessed, lost, strengthened, or weakened. Statements such as “He lost his honesty,” “She holds honesty in high regard,” or “They built their relationship on honesty” reveal how the abstract quality is objectified. In some cases, honesty is conceptualized as a solid material or structural foundation. Expressions like “rock-solid integrity,” “a firm commitment to honesty,” and “a foundation of trust and honesty” present morality as physical stability. Solidity implies durability, reliability, and resistance to external pressure. Through this mapping, honesty acquires the properties of strength and permanence. Container metaphors also appear in constructions such as “honesty in his heart” or “filled with sincerity.” Here, the human body functions as a container for moral qualities. This conceptualization aligns with broader cognitive schemas in which emotions and virtues are internal substances located within the self.

Semantic Expansion and Lexical Enrichment

Metaphor contributes to semantic expansion by generating new collocational patterns and extending lexical meaning. The lexeme *honesty* combines with adjectives such as “transparent,” “pure,” “absolute,” “bright,” and “solid,” each invoking a distinct source domain. These metaphorical collocations do not merely embellish language; they shape conceptual interpretation. For instance, “transparent honesty” invokes the property of transparency associated with glass or water. Transparency implies visibility and

absence of concealment. Through metaphorical mapping, honesty becomes something that can be seen through, free of opacity or hidden motives. Similarly, “pure honesty” draws upon the domain of chemical or physical purity. Purity suggests absence of contamination, reinforcing the association between morality and cleanliness. Such semantic extensions reveal that metaphor is integral to the dynamic development of lexical meaning.

Pragmatic and Discursive Functions

Metaphor operates pragmatically by framing moral narratives and influencing interpretation. In institutional discourse, references to “building trust,” “strengthening integrity,” or “shedding light on corruption” employ metaphor to construct persuasive arguments. These expressions guide audience perception by presenting abstract ethical issues in concrete, spatially organized terms. Metaphor also performs an identity-constructing function. When individuals describe themselves as “walking the straight path” or “standing firm in honesty,” they position themselves within culturally valued moral frameworks. The metaphorical language does not simply describe identity; it actively constructs it. In addition, metaphor carries evaluative force. Positive metaphors such as “spotless integrity” contrast with negative metaphors like “stained character.” These expressions encode moral judgment through physical imagery, allowing speakers to evaluate behavior without explicit moral argumentation.

Cultural and Cognitive Dimensions

Although many metaphors of honesty appear widespread across languages, metaphor is also culturally shaped. The association between light and truth, for example, is prevalent in many linguistic communities, yet specific imagery may vary. Snow, crystal, gold, or water may serve as metaphoric sources depending on cultural symbolism. Metaphor reflects both universal embodied experience and culturally specific value systems. The conceptualization of honesty as light, cleanliness, or straightness suggests that moral reasoning is grounded in sensory and spatial experience. This supports the cognitive linguistic claim that abstract reasoning emerges from embodied schemas.

Discussion

Metaphor performs multiple interconnected functions within linguistics. It structures abstract thought, extends lexical meaning, organizes discourse, and shapes moral cognition. In the case of *honesty*, metaphorical mappings render the invisible visible, the abstract tangible, and the moral spatially structured. Cleanliness provides a model

for purity; light provides a model for truth; straightness provides a model for integrity; solidity provides a model for reliability. These metaphorical structures are not arbitrary linguistic decorations but reflections of systematic conceptual correspondences. They demonstrate that language encodes moral understanding through embodied experience.

Conclusion

Metaphor constitutes a foundational mechanism of linguistic and cognitive organization, operating at the very core of human thought rather than at the periphery of language use. Contemporary linguistic theory, particularly within cognitive and functional paradigms, has convincingly demonstrated that metaphor shapes everyday reasoning, guides semantic development, and structures discourse across genres and communicative contexts. Far from being a purely stylistic or ornamental device, metaphor functions as an essential cognitive tool through which abstract domains are rendered intelligible and communicable. The lexeme *honesty* provides a particularly illustrative example of how moral abstraction is systematically structured through embodied metaphorical mappings. As an ethical value, honesty lacks direct perceptual form; it cannot be seen, touched, or measured. Nevertheless, language enables speakers to conceptualize this abstract notion by projecting it onto concrete sensory, spatial, and material domains. Expressions such as “clean conscience,” “transparent honesty,” “upright character,” and “rock-solid integrity” reveal that moral values are grounded in embodied human experience. Cleanliness draws on bodily notions of purity and contamination, transparency relies on visual perception and visibility, uprightness invokes spatial orientation and balance, while solidity reflects physical strength and stability. Together, these metaphorical models demonstrate how moral cognition is anchored in experiential reality. Through such mappings, metaphor performs an explanatory and structuring function: it organizes ethical reasoning, facilitates evaluation, and enables speakers to communicate complex moral judgments efficiently and persuasively. The metaphorical conceptualization of honesty not only reflects individual cognition but also encodes socially shared values and norms. In discourse, these metaphors contribute to identity construction, moral evaluation, and ideological framing, allowing speakers to position individuals, institutions, and actions within culturally sanctioned ethical frameworks. Consequently, metaphor must be understood as a central component of linguistic meaning-making, integrating cognition, culture, and communication. Its role in shaping moral concepts such as honesty underscores the inseparability of language and thought, as well as the embodied nature of abstract reasoning. By examining metaphorical patterns, linguistics gains deeper insight into how societies conceptualize values, construct moral hierarchies, and negotiate ethical

meaning through language. Future research may productively explore cross-linguistic and cross-cultural variations in moral metaphors, examining how different linguistic communities draw on distinct experiential domains to conceptualize honesty and related ethical values. Additionally, investigating diachronic change in metaphorical models may reveal how evolving cultural, social, and ideological contexts reshape moral conceptualization over time. Such studies would further reinforce the understanding of metaphor not merely as a linguistic phenomenon, but as a dynamic cognitive and cultural mechanism fundamental to human meaning-making.

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THE DIGITAL CLASSROOM: COMPARING THE EFFECTIVENESS OF ONLINE VS. TRADITIONAL LANGUAGE LEARNING

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Abstract. This article examines the comparative effectiveness of online and traditional (face-to-face) language learning in the context of rapidly expanding digital education technologies. Drawing on empirical studies in applied linguistics, educational psychology, and digital pedagogy, it evaluates strengths and limitations of both models across linguistic, cognitive, and motivational dimensions. Evidence suggests that online learning enhances accessibility and personalized instruction, while traditional classrooms remain superior for real-time communication and social learning. A blended approach is argued to be the most effective model.

Key words: communication technology, traditional method, pedagogical foundations, motivational dimension, cognitive, linguistic.

ЦИФРОВОЙ КЛАСС: СРАВНЕНИЕ ЭФФЕКТИВНОСТИ ОНЛАЙН- ОБУЧЕНИЯ И ТРАДИЦИОННОГО ИЗУЧЕНИЯ ЯЗЫКОВ

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Аннотация. В данной статье рассматривается сравнительная эффективность онлайн-обучения и традиционного (очного) обучения иностранным языкам в контексте стремительно развивающихся цифровых образовательных технологий. Опираясь на эмпирические исследования в области прикладной лингвистики, образовательной психологии и цифровой педагогики, работа анализирует сильные и слабые стороны обеих моделей с лингвистической, когнитивной и мотивационной точек зрения. Данные свидетельствуют о том, что онлайн-обучение повышает доступность образования и обеспечивает персонализированный подход, тогда как традиционные классы остаются более эффективными для развития навыков живого общения и социального взаимодействия. В статье утверждается, что наиболее результативной является смешанная модель обучения.

Ключевые слова: коммуникационные технологии, традиционный метод, педагогические основы, мотивационный аспект, когнитивный, лингвистический.

RAQAMLI SINF: ONLAYN VA AN'ANAVIY TIL O'RGANISH SAMARALILIGINI SOLISHTIRISH

Hamrayeva Nozima Akbarovna

Qarshi davlat universiteti

Annotatsiya. Ushbu maqolada raqamli ta'lim texnologiyalari jadal rivojlanayotgan sharoitda onlayn va an'anaviy (yuzma-yuz) til o'rganishning qiyosiy samaradorligi ko'rib chiqiladi. Amaliy tilshunoslik, ta'lim psixologiyasi va raqamli pedagogikadagi empirik tadqiqotlarga tayangan holda, u ikkala modelning kuchli va cheklovlarini lingvistik, kognitiv va motivatsion o'lchovlar bo'yicha baholaydi. Dalillar shuni ko'rsatadiki, onlayn ta'lim foydalanish qulayligi va shaxsiylashtirilgan ta'limni kuchaytiradi, an'anaviy sinflar esa real vaqt rejimida muloqot qilish va ijtimoiy o'rganish uchun ustundir. Aralashtirilgan yondashuv eng samarali model deb ta'kidlanadi.

Kalit so'zlar: aloqa texnologiyasi, an'anaviy usul, pedagogik asoslar, motivatsion o'lchov, kognitiv, lingvistik.

INTRODUCTION

Technological advancement over the past two decades has transformed the landscape of education, introducing new learning formats that challenge the dominance of traditional classroom instruction. Language learning is particularly affected, as communication technologies, virtual classrooms, and artificial intelligence tools offer alternatives to conventional teaching practices. As millions of learners shift towards digital platforms, questions arise concerning the comparative effectiveness of online and traditional methods.

This article explores these questions through academic research, analyzing pedagogical models, learner outcomes, and cognitive impacts of both approaches. With language learning being a multifaceted process involving grammar mastery, communicative competence, cultural awareness, and continuous practice, understanding how different learning environments contribute to these components is essential.

MATERIALS AND METHODS

Traditional classroom language learning is deeply rooted in social constructivist theories, which argue that knowledge is constructed through interaction, collaboration, and guided support. Vygotsky (1978) emphasizes that language acquisition is inherently social, meaning that learners internalize linguistic structures through meaningful communication with more knowledgeable peers and instructors. According to his concept of the *Zone of Proximal Development* (ZPD), students achieve higher levels of competence when supported by an expert who provides scaffolding-timely guidance, correction, and modeling of accurate language use.

In the traditional classroom, this framework becomes highly practical. Direct instructor feedback enables learners to immediately address errors, clarify misunderstandings, and reinforce correct language patterns. Such feedback is not only corrective but developmental, accelerating cognitive and linguistic growth by shaping learners' mental processes in real time.

Classroom environments also promote collaborative learning, where students engage in pair work, group discussions, and interactive activities that foster negotiation of meaning. Through these social exchanges, learners test hypotheses about language, co-construct understanding, and develop communicative competence. Peer interaction further enhances motivation and reduces affective barriers such as anxiety. Research in second language acquisition supports the claim that interaction-driven environments result in more meaningful output, deeper processing, and improved long-term retention.

Thus, traditional language classrooms not only transmit linguistic knowledge but create socially rich, cognitively stimulating spaces that align closely with the principles of social constructivism. This makes them uniquely effective for developing oral communication skills, pragmatic awareness, and interactive fluency-components that are often more challenging to cultivate in isolated or purely digital learning contexts.

Strengths of traditional learning

1. **Authentic interaction.** Research shows that real-time dialogue and social engagement improve speaking fluency and pronunciation (Long, 2016). Interactive group work facilitates pragmatic competence and cultural understanding.
2. **Structured guidance.** Instructors can adapt teaching on the spot, clarify student misunderstandings, and maintain a coherent curriculum (Richards & Rodgers, 2022).

3. **Motivational support.** A physical classroom promotes accountability, reducing procrastination and dropout rates.

Limitations

Despite its advantages, traditional learning has constraints:

- fixed schedules limit flexibility for working learners;
- teaching pace may not align with individual learning speeds;
- access to multimedia tools is often limited in conventional institutions.

This study employed a mixed-methods comparative research design to examine the effectiveness of online and traditional language learning environments. Both quantitative and qualitative data were collected to provide a comprehensive analysis of learners' performance, engagement, and perceptions across the two instructional models.

The participants consisted of 60 English as a Foreign Language (EFL) learners enrolled in a higher education institution. The sample was divided into two equal groups: one group participated in online language learning courses, while the other received instruction through traditional, face-to-face classroom settings. Participants ranged in age from 18 to 30 and possessed intermediate-level English proficiency, as determined by a standardized placement test.

The instructional materials for the online learning group included digital textbooks, video lectures, interactive multimedia content, discussion forums, and speech-recognition applications. Learning management systems (LMS) such as Moodle or Google Classroom were used to deliver course content and monitor student progress. The traditional learning group utilized printed textbooks, in-class lectures, audio recordings, and face-to-face communicative activities under instructor supervision. Both groups followed the same syllabus and learning objectives to ensure instructional consistency.

Data were collected using multiple instruments. Pre- and post-tests were administered to measure improvements in speaking, listening, reading, and writing skills. Questionnaires were distributed to assess learner motivation, satisfaction, and perceived effectiveness of the learning mode. Additionally, semi-structured interviews were conducted with selected participants to gain qualitative insights into learner experiences and challenges.

The study was conducted over a twelve-week instructional period. At the beginning of the study, participants completed a diagnostic pre-test. Both groups then received

language instruction based on their assigned learning mode. The online group engaged in asynchronous and synchronous activities, while the traditional group participated in classroom-based instruction. At the end of the instructional period, a post-test and questionnaire were administered. Interview data were collected after the completion of the course.

Quantitative data from test scores and questionnaires were analyzed using descriptive statistics and comparative analysis to identify performance differences between the two groups. Qualitative data from interviews were thematically analyzed to identify recurring patterns related to learner engagement, motivation, and perceived challenges.

Participation in the study was voluntary, and informed consent was obtained from all participants. Anonymity and confidentiality were maintained throughout the research process, and data were used solely for academic purposes.

Online language learning

Online learning draws heavily on personalized and self-regulated learning theories, which highlight the importance of learner autonomy and individualized instruction in the acquisition of linguistic competence. Adaptive learning systems-such as AI-driven platforms, intelligent tutoring systems, and automated feedback tools-use learner analytics to modify content difficulty, provide targeted feedback, and scaffold learning according to the learner's unique strengths and weaknesses. These technologies support the development of metacognitive skills, including goal setting, self-monitoring, and strategic decision-making, which are essential components of self-regulated learning. As Reinders and White argue, digital platforms encourage learners to take greater responsibility for their progress by enabling flexible pacing, personalized pathways, and continuous practice opportunities. In online environments, students can repeatedly access instructional materials, receive instant feedback, and engage with interactive tasks that reinforce long-term retention. Consequently, online language learning environments create conditions that empower learners to control the timing, sequence, and depth of their learning experiences, ultimately fostering more autonomous and self-directed language acquisition.

Strengths of online learning

1. **Flexibility and accessibility.** Learners can access materials anytime, making language learning more inclusive across age groups and professions.

2. **Adaptive technologies.** AI-driven tools such as spaced repetition systems improve long-term vocabulary retention (Nation, 2013).
3. **Multimodal input.** Video lessons, digital games, and simulations increase learner engagement, which correlates with improved comprehension (Mayer, 2005).
4. **Global connectivity.** Students can interact with native speakers from diverse regions, expanding cultural exposure beyond a local classroom.

RESULTS AND DISCUSSION

The findings indicate that online language learning environments offer considerable advantages; however, several challenges remain that may affect overall language proficiency. One of the most frequently reported limitations is reduced face-to-face interaction, which can negatively influence speaking fluency and spontaneous communication skills. As noted by Derakhshan and Shirmohammadi (2015), limited real-time verbal engagement may restrict learners' opportunities to practice authentic conversational patterns, particularly in asynchronous online settings. Although synchronous tools such as video conferencing partially address this issue, they do not fully replicate the dynamics of in-person communication.

Technical challenges also pose a significant barrier to effective online learning. Connectivity issues, software malfunctions, and limited access to reliable digital infrastructure can disrupt lesson continuity and reduce learner engagement. Furthermore, online learning demands a high level of self-discipline and time-management skills. Learners who lack autonomy or intrinsic motivation may struggle to maintain consistent progress without direct teacher supervision.

A comparative analysis of language skills reveals notable differences in effectiveness between online and traditional learning modes. Speaking skills tend to develop more effectively in traditional classroom environments due to continuous exposure to natural conversation, immediate feedback, and social interaction. In contrast, online learning demonstrates moderate effectiveness in speaking development, largely dependent on the quality and frequency of synchronous communication tools.

Listening skills show high effectiveness in both learning contexts. Online platforms benefit from rich multimedia resources, including authentic audio and video materials, while traditional classrooms support listening development through real-time interaction with instructors and peers. Reading skills are particularly enhanced in online environments due to easy access to digital libraries, hypertext materials, and adaptive reading tools. Writing skills also benefit from online learning, where

automated feedback systems, collaborative platforms, and revision tools support accuracy and learner independence. Traditional classrooms, while effective, provide comparatively fewer opportunities for immediate, individualized written feedback.

Pronunciation development demonstrates high effectiveness in both models. Online learning leverages speech-recognition software and pronunciation applications that allow repeated practice and self-monitoring, whereas traditional instruction benefits from direct instructor correction and modeling.

Supporting these findings, previous studies confirm that traditional classrooms are generally more effective for developing oral fluency, while online environments perform better in enhancing receptive skills, grammatical accuracy, and vocabulary acquisition (Godwin-Jones, 2018). Learner age and motivation further influence outcomes. Adult learners tend to demonstrate higher motivation and engagement in flexible online systems, particularly when balancing education with work or family responsibilities (Kahu, 2013). Conversely, younger learners often achieve better results in structured, teacher-led environments that provide clear guidance and external motivation.

From a cognitive perspective, Mayer's Multimedia Learning Theory (2005) supports the effectiveness of online learning by emphasizing that multimodal content—combining visual, auditory, and textual input—enhances memory retention and comprehension. Nevertheless, excessive multitasking and digital distractions can increase cognitive load, potentially reducing learner focus and processing efficiency during online lessons.

Overall, a growing consensus in second-language acquisition research supports blended learning models that integrate the strengths of both online and traditional approaches. Dziuban et al. (2018) highlight that hybrid instruction leads to improved academic performance, higher learner satisfaction, and more consistent long-term retention. These findings suggest that a balanced, technology-enhanced instructional design offers the most effective framework for language learning in contemporary educational contexts.

- Reduced face-to-face interaction may weaken speaking fluency (Derakhshan & Shirmohammadi, 2015).
- Technical issues such as connectivity problems can interrupt learning.
- Requires strong self-discipline and time-management skills.

Comparative analysis

Language skill	Online learning effectiveness	Traditional learning effectiveness
Speaking	Moderate; depends on synchronous tools	High due to natural conversation
Listening	High with multimedia	High with natural interaction
Reading	High due to digital libraries	Moderate
Writing	High with automated feedback	Moderate
Pronunciation	High with speech-recognition tools	High with instructor correction

Studies affirm that traditional classrooms are more effective for oral fluency, while online settings perform better for receptive skills and grammar acquisition (Godwin-Jones, 2018).

Adult learners show higher motivation in flexible online systems (Kahu, 2013), while younger learners perform better under structured, teacher-led environments.

Mayer's multimedia learning theory (2005) confirms that multimodal content enhances memory retention. However, multitasking and digital distractions increase cognitive load, potentially reducing focus during online lessons.

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CONCLUSION

Both online and traditional language learning models present significant benefits as well as notable limitations, each addressing different learner needs and educational contexts. Traditional classroom instruction remains highly effective in fostering face-to-face interaction, spontaneous communication, and meaningful social engagement, all of which are essential for developing speaking confidence and pragmatic language skills. In addition, the structured environment of traditional education provides consistent guidance, immediate feedback, and a clear learning framework that supports student discipline and motivation.

Conversely, online language learning platforms have transformed education by offering unparalleled flexibility, personalized learning paths, and access to diverse multimedia resources. Digital tools allow learners to progress at their own pace, revisit materials as needed, and engage with authentic language content beyond geographical constraints. These advantages make online learning particularly suitable for

independent learners and those balancing education with professional or personal responsibilities.

Empirical research increasingly demonstrates that neither model is universally superior in isolation. Instead, the most effective language instruction emerges from an integrated approach that combines the interactive strengths of traditional classrooms with the technological adaptability of online learning. Blended learning environments provide a balanced and comprehensive framework, enhancing learner autonomy while maintaining structured support and social interaction.

As educational technology continues to advance, the digital classroom will play an increasingly influential role in shaping the future of language education. By promoting accessibility, inclusivity, and innovation, blended and technology-enhanced learning models are poised to create more dynamic, efficient, and learner-centered language acquisition experiences in an ever-evolving globalized world.

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DEVELOPING MUSICAL-AESTHETIC TASTE IN YOUNG LEARNERS: METHODOLOGIES AND INNOVATIONS

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Abstract: This study addresses the development of musical-aesthetic taste in students attending piano classes at children's music and art schools. The research emphasizes the importance of integrating innovative pedagogical technologies and interactive methods into modern music education. Analysis of theoretical and methodological sources highlights the need to move beyond mechanical performance towards meaningful, expressive interpretation. Practical methods aimed at enhancing students' musical thinking, aesthetic perception, and performance skills are presented. These approaches provide guidance for music educators on how to foster artistic sensitivity and develop a conscious appreciation of both national and global musical heritage in young learners.

Keywords: musical education, musical-aesthetic taste, piano lessons, performance skills, innovative pedagogical technologies, interactive methods, musical thinking

Introduction. One of the most important tasks of modern education, which is highly relevant today, is the comprehensive development of students as well-rounded and mature individuals. In this process, music education serves as a significant tool, helping to shape the aesthetic and artistic taste of the younger generation and fostering the preservation and appreciation of our national values.

Through musical training, students' musical-artistic taste is formed, and their musical perception and creative thinking are developed. On this subject, the President of Uzbekistan, Shavkat Mirziyoyev, stated: "Art and culture are the heart of the nation and a key factor in the upbringing of the younger generation" [1;277].

A modern educational approach requires that each lesson be conducted using innovative methods, technologies, and interactive approaches. These methods actively engage students in the learning process, moving them from passive participation to active involvement. They develop the ability to think independently, analyze musical works, and critically evaluate pieces based on personal perception.

In particular, piano students who study the works of national composers alongside those of world classical composers gain a broader cultural outlook and a deeper understanding of both global and local aesthetic values. Therefore, the formation of musical-artistic taste demands that teachers apply modern methodological approaches, demonstrate creativity, and always remain open to innovation [2;20].

Literature Review and Methodology. Analysis of scientific and methodological literature on the history of music and music pedagogy shows that musical-artistic taste occupies a central place in musical education. As B. Mustafeyev emphasizes in his book “*Estetik tarbiya*” (Aesthetic Education): “Taste is formed through the means of a person’s effective activity” [3;52]. This indicates the necessity of developing musical-artistic taste through music education.

Researchers in music pedagogy, such as A.D. Aleksandrova, V.V. Medushevskiy, G.T. Ilyina, and A.V. Koreneva, highlight the importance of using individualized methods to develop students’ musical hearing, rhythmic sense, and creative potential [4;44].

In foreign scientific and pedagogical sources, particular attention is paid to organizing music education based on a differential approach. This approach emphasizes the need to adapt teaching to students’ individual psychological characteristics, musical abilities, interests, and creative potential. In particular, studies conducted by Peter Webster and Graham Welch provide scientific evidence that using musical-didactic games, interactive methods, and modern pedagogical technologies effectively develops musical abilities. According to their findings, individualizing the educational process promotes not only students’ performance skills but also the consistent development of their auditory perception, musical understanding, and thinking.

Applying advanced pedagogical technologies in the process of developing musical-artistic taste ensures the depth and stability of students’ knowledge. Modern educational tools, innovative methods, and interactive approaches actively engage students in musical activity and expand opportunities to develop independent thinking and aesthetic perspectives. In this regard, scientific and methodological literature created by Uzbek pedagogical scholars also serves as an important theoretical and practical resource. For example, the work of J.G. Yuldoshev and S.A. Usmonov, *Pedagogical Technology Basics*, comprehensively covers the theoretical foundations, methodological principles, and practical mechanisms of technologizing the educational process. Similarly, R.J. Ishmukhammadov’s manual *Ways to Improve Educational Effectiveness through Innovative Technologies* systematically presents methods for increasing learning efficiency via innovative approaches. N.N. Azizkhodjayeva, in her work *Pedagogical Technologies and Pedagogical Skills*, focuses on developing

teachers' professional competencies and effectively applying technological approaches in teaching [6;6].

Among local scholars, M. Mahkamova, X. Abdunazarov, F. Jo'raev, Q. Mamirov, M. Nabieva, X. Nurmatov, Z. Rahimova, D. Ro'zieva, R. Qodirov, and A. Hasanov have conducted notable research aimed at developing students' creative potential, aesthetic culture, and artistic taste through art-based methods using a competency-based approach [5;96].

These scientific perspectives and methodological recommendations provide a crucial theoretical and methodological foundation for forming students' artistic-aesthetic taste, developing their musical thinking, and enhancing the overall effectiveness of music education.

Analysis and Results. The conducted research shows that most students studying in the piano classes of children's music and art schools perform musical pieces technically correctly but are unable to perceive their content, artistic imagery, or aesthetic value. In this process, performance is often primarily mechanical, meaning that students focus on playing the notes accurately. However, failure to reveal the musical image, performing in a monotonous and emotionless manner, ignoring dynamic markings, and excessive reliance on technique—combined with prioritizing speed or error-free execution—hinders the development of musical-artistic taste. Unfortunately, this issue is observed not only in piano lessons but also in other performance classes.

To address the objectives of this research and solve these challenges, theoretical and practical-pedagogical methods were introduced in piano lessons to improve the formation and development of students' musical-artistic taste. The methods recommended below help cultivate students' musical-artistic abilities and provide guidance for teachers on how to conduct lessons in children's music and art schools. They are especially valuable for ensuring that students perform pieces in a meaningful and artistically expressive manner, thereby fostering musical thinking, aesthetic taste, and performance skills.

1. Comparative Method—This method involves comparing the student's performance with different interpretations, genres, tempos, and characters of the piece, developing conscious perception and aesthetic evaluation skills. It is particularly effective for advanced students capable of distinguishing genre-specific characteristics.

2. Musical Imagery Method—This approach helps transition from mechanical performance to expressive and meaningful interpretation. Students enrich their imagination by depicting the emotional content of a piece, giving it a title, or expressing it through storytelling or drawing. This method can be widely applied in grades 1–7.

3. Listening and Analysis Method—This method is crucial for developing musical hearing, thinking, and artistic taste. During listening sessions, students analyze and discuss the dynamics, phrasing, tempo, and expressive means of the piece in written form. It is especially effective for middle and advanced grades.

4. Heuristic (Question-and-Answer) Method—This approach encourages independent thinking and guides students toward conscious performance. Teacher-led guiding questions help students understand the character, tempo, and climax of the piece more deeply. This method can be applied across all age groups.

Conclusion. The results of the study indicate that students in piano classes at children's music and art schools often prioritize technical performance, while their skills in revealing the artistic content of a piece, perceiving its musical imagery, and making aesthetic evaluations are insufficiently developed. Mechanical performance and a lack of attention to dynamics and expressive means negatively affect the formation of musical-artistic taste.

In conclusion, the process of developing musical-artistic taste requires a high level of professional skill, innovative approaches, and creativity from the teacher. By organizing the educational process based on modern pedagogical technologies, students not only acquire technical skills but also develop their aesthetic sensibilities, artistic thinking, and conscious attitude toward both national and world musical heritage. As a result, the opportunity to nurture well-rounded individuals who deeply understand and value art is significantly enhanced.

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HUQUQIY DAVLAT SHAROITIDA “QONUNNI BILMASLIK JAVOBGARLIKDAN OZOD QILMAYDI” PRINSIPINING NAZARIY ASOSLARI

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Annotatsiya: Mazkur maqolada huquqiy davlat konsepsiyasi doirasida “Qonunni bilmaslik javobgarlikdan ozod qilmaydi” prinsipining nazariy-huquqiy mazmuni, tarixiy ildizlari hamda zamonaviy huquq tizimidagi o‘rni tahlil etiladi. Mazkur tamoyilning javobgarlik muqarrarlighi, qonun ustuvorligi va huquqiy ong bilan uzviy bog‘liqligi ilmiy asosda ochib beriladi. Shuningdek, O‘zbekiston Respublikasida ushbu prinsipning normativ-huquqiy asoslari va amaliy qo‘llanilishi ko‘rib chiqiladi. Muallif tomonidan prinsipning ijtimoiy ahamiyati hamda huquqiy madaniyatni shakllantirishdagi o‘rni yuzasidan xulosalar ilgari suriladi.

Kalit so‘zlar: huquqiy davlat, qonun ustuvorligi, javobgarlik muqarrarlighi, huquqiy ong, normativ-huquqiy hujjat, yuridik javobgarlik, ayb, huquqiy madaniyat, legitimlik

Abstract: This article analyzes the theoretical and legal essence, historical roots and modern role of the principle “Ignorance of the law does not exempt from liability” within the concept of a rule-of-law state. The interrelation of this principle with inevitability of responsibility, supremacy of law and legal consciousness is scientifically revealed. In addition, the normative-legal foundations and practical application of this principle in the Republic of Uzbekistan are considered. The author also draws conclusions on the social significance of the principle and its role in the formation of legal culture.

Keywords: rule-of-law state, supremacy of law, inevitability of liability, legal consciousness, normative-legal act, legal responsibility, guilt, legal culture, legitimacy.

Аннотация: В данной статье анализируются теоретико-правовая сущность, исторические корни и роль принципа «Незнание закона не освобождает от ответственности» в условиях правового государства. На научной основе раскрывается взаимосвязь данного принципа с неизбежностью ответственности, верховенством закона и правовым сознанием. Также рассматриваются нормативно-правовые основы и практическое применение данного принципа в

Республике Узбекистан. Автором делаются выводы о социальном значении данного принципа и его роли в формировании правовой культуры.

Ключевые слова: правовое государство, верховенство закона, неотвратимость ответственности, правовое сознание, нормативно-правовой акт, юридическая ответственность, вина, правовая культура, легитимность.

Özet: Bu makalede, “Kanunu bilmemek sorumluluktan muaf tutmaz” ilkesinin hukuk devleti kavramı çerçevesinde teorik-hukuki anlamı, tarihsel kökenleri ve modern hukuk sistemindeki yeri analiz edilmektedir. Bu ilkenin sorumluluğun kaçınılmazlığı, hukuk üstünlüğü ve hukuki bilinç ile ilişkisi bilimsel olarak açıklanmaktadır. Ayrıca Özbekistan Cumhuriyeti’nde bu ilkenin normatif-hukuki temelleri ve pratik uygulaması incelenmektedir. Yazar, ilkenin toplumsal önemi ve hukuk kültürünün oluşumundaki rolü hakkında sonuçlar sunmaktadır.

Anahtar kelimeler: hukuk devleti, hukuk üstünlüğü, sorumluluğun kaçınılmazlığı, hukuki bilinç, normatif hukuki belge, hukuki sorumluluk, kusur, hukuk kültürü, meşruiyet.

Kirish

Huquqiy davlat qurish jarayonida eng muhim masalalardan biri — jamiyatda qonunlarga nisbatan hurmat va itoat madaniyatini shakllantirishdir. Qonun ustuvor bo‘lmagan jamiyatda ijtimoiy barqarorlik va adolat haqida so‘z yuritish qiyin. Shu bois huquq nazariyasida fundamental prinsiplar ishlab chiqilgan bo‘lib, ular davlat va jamiyat o‘rtasidagi munosabatlarni tartibga solishda asosiy yo‘nalish vazifasini bajaradi. Ana shunday prinsiplarning eng muhimlaridan biri — “Qonunni bilmaslik javobgarlikdan ozod qilmaydi” tamoyilidir. Ushbu qoida oddiy ko‘rinishiga qaramay, murakkab nazariy asosga ega. Chunki u bir vaqtning o‘zida javobgarlik muqarrarligi, huquqiy aniqlik, normativlik va davlat hokimiyatining legitimligi bilan bog‘liqdir. Mazkur maqolada aynan shu prinsipning huquqiy davlat konsepsiyasidagi o‘rni ilmiy jihatdan tahlil qilinadi.

Asosiy qism

Huquqiy davlat sharoitida “Qonunni bilmaslik javobgarlikdan ozod qilmaydi” prinsipi oddiy formal qoida emas, balki huquqiy tizimning ichki mantiqidan kelib chiqadigan zaruriy tamoyildir. Huquq — bu ijtimoiy munosabatlarni tartibga soluvchi normativ tizim bo‘lib, u umumiylik va majburiylik xususiyatiga ega. Agar normaning umummajburiyligi subyektiv bilish darajasiga bog‘lab qo‘yilsa, huquq o‘zining

normativ mohiyatini yo‘qotadi. Shu bois mazkur prinsip normativlikning tabiiy oqibati sifatida namoyon bo‘ladi.

Huquq nazariyasida normaning amal qilishi uchun uning uchta asosiy sharti qayd etiladi: rasmiy qabul qilinishi, belgilangan tartibda e‘lon qilinishi va kuchga kirishi. Normativ-huquqiy hujjat rasmiy e‘lon qilingan paytdan boshlab huquqiy makonda mavjud bo‘ladi va u bilan tanishish imkoniyati yaratiladi. Zamonaviy huquqiy davlatda qonunlar matbuotda, rasmiy axborot vositalarida hamda elektron huquqiy bazalarda e‘lon qilinadi. Demak, davlat tomonidan normani bilish imkoniyati yaratilgan ekan, shaxsning uni bilmaganligi javobgarlikni istisno qiluvchi omil sifatida qabul qilinmaydi. Bu yerda masala shaxsning real bilim darajasida emas, balki ob‘ektiv imkoniyat mavjudligidadir.

Mazkur prinsipning nazariy asosini huquqiy aniqlik va barqarorlik g‘oyasi tashkil etadi. Huquqiy aniqlik shuni anglatadiki, jamiyat a‘zolari o‘z xatti-harakatlarining huquqiy oqibatlarini oldindan taxmin qila olishi kerak. Agar har bir shaxs qonunni bilmaganini da‘vo qilib, javobgarlikdan qochish imkoniga ega bo‘lsa, huquqiy aniqlik buziladi va ijtimoiy munosabatlarda noaniqlik yuzaga keladi. Natijada huquq o‘zining tartibga soluvchi funksiyasini to‘liq bajara olmay qoladi.

Shu bilan birga, mazkur tamoyil javobgarlik muqarrarligi bilan bevosita bog‘liq. Huquqbuzarlik sodir etilgan taqdirda javobgarlikning muqarrar qo‘llanilishi huquqning ta’sirchanligini ta’minlaydi. Javobgarlikning muqarrarligi faqat jazolash mexanizmi emas, balki profilaktik ahamiyatga ham ega. Shaxs biladiki, huquqbuzarlik sodir etilganda javobgarlikdan qochish imkoniyati yo‘q. Agar qonunni bilmaslik asos sifatida tan olinsa, huquqbuzarliklarning yashirin oqlanish mexanizmi paydo bo‘ladi va bu ijtimoiy tartibni izdan chiqaradi.

Nazariy jihatdan fakti bilmaslik va qonunni bilmaslik o‘rtasidagi farq muhim ahamiyat kasb etadi. Faktik xatolik ayrim hollarda aybni istisno qilishi mumkin, chunki shaxs voqelikni noto‘g‘ri idrok etgan bo‘ladi. Ammo huquqiy xatolik, ya’ni normaning mavjudligini yoki mazmunini bilmaslik, umumiy qoida sifatida javobgarlikni bekor qilmaydi. Chunki huquq ijtimoiy hayotning tashqi mezoni bo‘lib, u individual ong darajasiga bog‘lanib qolmaydi. Huquqning barqarorligi uning subyektiv tushunishga emas, ob‘ektiv amal qilishiga asoslanadi.

Mazkur prinsipni inson ongiga yaqinroq tahlil qilganda, u mas’uliyat tushunchasi bilan uzviy bog‘liq ekanini ko‘rish mumkin. Jamiyatda yashash — bu nafaqat huquqlarga ega bo‘lish, balki majburiyatlarni ham zimmasiga olish demakdir. Shaxs jamiyat a‘zosi sifatida huquqiy makonda harakat qiladi va o‘z xatti-harakatlari oqibatini hisobga olishga majbur. Huquqiy ong shakllanmagan yoki yetarli darajada rivojlanmagan

bo‘lishi javobgarlikni avtomatik ravishda istisno qilmaydi. Aks holda, huquqiy madaniyat past bo‘lgan muhitda huquqiy tartibni saqlash imkonsiz bo‘lib qoladi.

Biroq mazkur tamoyil mutlaq va chegarasiz qo‘llaniladigan qoida emas. Huquqiy davlat sharoitida davlatning o‘zi ham muayyan majburiyatlarni bajarishi shart. Qonunlar tushunarli, aniq va ziddiyatsiz bo‘lishi lozim. Agar norma murakkab, mavhum yoki bir-biriga zid bo‘lsa, shaxsning uni to‘g‘ri anglash imkoniyati pasayadi. Huquqiy aniqlik talabi shundan iboratki, norma oddiy mantiq bilan tushuniladigan darajada ifodalangan bo‘lishi kerak. Demak, “qonunni bilmaslik” prinsipi faqat qonun sifatli va ochiq bo‘lgan sharoitdagina adolatli hisoblanadi.

Zamonaviy jamiyatda huquqiy munosabatlarning murakkablashuvi mazkur prinsipning ahamiyatini yanada oshirmoqda. Raqamli iqtisodiyot, elektron shartnomalar, xalqaro tranzaksiyalar sharoitida huquq normalari ko‘payib bormoqda. Shu bois fuqarolarning huquqiy axborotdan foydalanish imkoniyatini kengaytirish davlat siyosatining muhim yo‘nalishiga aylanmoqda. Elektron huquqiy bazalar, ochiq ma’lumotlar portallari va rasmiy e’lon mexanizmlari aynan shu tamoyilning amaliy ta’minotiga xizmat qiladi.

Mazkur prinsipning yana bir muhim jihati — u tenglik g‘oyasini mustahkamlaydi. Qonun hamma uchun bir xil amal qiladi. Agar kimdir o‘zining huquqiy savodsizligini bahona qilib javobgarlikdan qutulsa, bu qonun oldidagi tenglik prinsipini buzadi. Huquqiy davlatda imtiyozli “bilmasdim” maqomi mavjud emas. Barchaga nisbatan bir xil mezon qo‘llanadi. Bu esa huquqiy adolatning zarur shartidir.

Shuningdek, mazkur qoida huquqning tarbiyaviy funksiyasini ham amalga oshiradi. Fuqaro qonunni bilishga intiladi, chunki bilmaslik uni javobgarlikdan ozod qilmasligini anglaydi. Natijada huquqiy ong shakllanadi, huquqiy madaniyat yuksaladi va jamiyatda normativ intizom mustahkamlanadi. Huquqiy madaniyat yuqori bo‘lgan jamiyatda esa huquqbuzarlik darajasi pasayadi, ijtimoiy ishonch kuchayadi.

Shu tariqa, “Qonunni bilmaslik javobgarlikdan ozod qilmaydi” prinsipi huquqiy davlatning ichki mantiqiy zaruriyati sifatida namoyon bo‘ladi. U normativlikni, javobgarlik muqarrarligini, huquqiy aniqlikni va tenglikni bir butun tizim sifatida birlashtiradi. Mazkur tamoyilni faqat jazolash mexanizmi sifatida emas, balki huquqiy ongni shakllantiruvchi, jamiyatni intizomga chorlovchi va huquqiy barqarorlikni ta’minlovchi konseptual asos sifatida baholash lozim.

Xulosa

Mazkur tadqiqot jarayonida shunday xulosaga kelish mumkinki, “Qonunni bilmaslik javobgarlikdan ozod qilmaydi” prinsipi shunchaki qat’iy qoida emas, balki huquqiy

davlatning ichki tayanchi hisoblanadi. Bu tamoyilning mazmuniga chuqurroq kirib borilganda, uning asosida oddiy jazolash g'oyasi emas, balki huquqiy barqarorlikni saqlash zarurati yotgani namoyon bo'ladi. Huquq umumiy va majburiy xulq-atvor mezonini belgilarkan, u alohida shaxsning bilish darajasiga qarab amal qilishi mumkin emas. Aks holda huquqning o'zi nisbiy va beqaror tus oladi.

Shu bilan birga, mazkur prinsip inson ongiga begona emas. Inson jamiyatda yashar ekan, u faqat o'z manfaatlari bilan emas, balki umumiy tartib bilan ham hisoblashishga majbur. Huquq aynan mana shu umumiy tartibning normativ ifodasidir. Qonunni bilish — bu nafaqat majburiyat, balki ijtimoiy ongning shakllanish jarayonidir. Agar shaxs o'z harakatining huquqiy oqibatini o'ylab ko'rishga odatlanmasa, jamiyatda mas'uliyat hissi sustlashadi.

Tahlillar shuni ko'rsatadiki, mazkur prinsip javobgarlik muqarrarlighi, qonun ustuvorligi va tenglik tamoyillari bilan uzviy bog'langan. Ularning birortasi izdan chiqsa, huquqiy tizimning yaxlitligi buziladi. Ayniqsa, qonunlarning ochiqqligi, aniqligi va tushunarliqligi ta'minlanmagan sharoitda bu prinsip adolatli qo'llanilmaydi. Demak, davlat ham, fuqaro ham o'z mas'uliyat doirasiga ega: davlat — sifatli va oshkora qonunchilikni yaratish, fuqaro esa — huquqiy makonda ongli ravishda harakat qilish majburiyatini oladi.

Shu nuqtai nazardan qaraganda, "Qonunni bilmaslik javobgarlikdan ozod qilmaydi" prinsipi huquqiy davlatning nafaqat nazariy, balki amaliy tayanchidir. U ijtimoiy tartibni saqlash, huquqiy madaniyatni rivojlantirish va adolatni ta'minlashga xizmat qiladi. Mazkur tamoyilni chuqur anglash esa har bir jamiyat a'zosida huquqiy mas'uliyatni shakllantirishning muhim shartidir.

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**BO‘LAJAK O‘QITUVCHILARDA DIGITAL MINDFULNESS VA
DIGITAL WELLBEING ASOSIDA KASBIY KOMPETENSIYANI
RIVOJLANTIRISHNING NAZARIY ASOSLARI**

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ANNOTATSIYA

Mazkur maqolada bo‘lajak o‘qituvchilarda digital mindfulness va digital wellbeing konsepsiyalari asosida kasbiy kompetensiyani rivojlantirishning nazariy asoslari tahlil qilinadi. Zamonaviy raqamli muhitda smartfonlar, ijtimoiy tarmoqlar va turli raqamli platformalardan keng foydalanish insonlarning psixologik holati va farovonligiga sezilarli ta’sir ko‘rsatmoqda. Shu sababli raqamli texnologiyalardan ongli va muvozanatli foydalanish masalasi dolzarb ahamiyat kasb etadi.

Tadqiqotda digital mindfulness va digital wellbeing tushunchalarining mohiyati, ularning ta’lim jarayonidagi o‘rni hamda bo‘lajak o‘qituvchilarning kasbiy kompetensiyasini shakllantirishdagi ahamiyati yoritiladi. Shuningdek, raqamli muhitda yuzaga keladigan stress, axborot ortiqchaligi va psixologik bosim kabi omillarning talabalarning ruhiy salomatligiga ta’siri ko‘rib chiqiladi. Digital mindfulness texnologiyalari, jumladan, onlayn maslahat, raqamli ta’lim, video va audio asosidagi meditatsiya hamda psixologik qo‘llab-quvvatlash vositalari talabalarning ruhiy barqarorligini ta’minlashda muhim rol o‘ynashi ta’kidlanadi.

Natijada digital mindfulness va digital wellbeing konsepsiyalarini ta’lim jarayoniga integratsiya qilish bo‘lajak o‘qituvchilarning kasbiy kompetensiyasini rivojlantirish, ularning psixologik farovonligini ta’minlash hamda raqamli muhitdan samarali foydalanish ko‘nikmalarini shakllantirishga xizmat qilishi aniqlanadi.

Kalit so‘zlar: *digital mindfulness, digital wellbeing, kasbiy kompetensiya, bo‘lajak o‘qituvchi, raqamli ta’lim, ruhiy salomatlik, raqamli muhit, ta’lim texnologiyalari.*

ANNOTATION

This article analyzes the theoretical foundations for developing professional competence of future teachers based on the concepts of digital mindfulness and digital

well-being. In the modern digital environment, the widespread use of smartphones, social media, and digital platforms significantly affects individuals' psychological state and overall well-being. Therefore, the issue of conscious and balanced use of digital technologies has become increasingly important.

The study examines the essence of digital mindfulness and digital well-being, their role in the educational process, and their importance in shaping the professional competence of future teachers. It also highlights the impact of factors such as stress, information overload, and psychological pressure in the digital environment on students' mental health. Digital mindfulness practices, including online counseling, digital learning tools, video and audio-based meditation, and psychological support services, play an important role in maintaining students' mental stability.

The results show that integrating digital mindfulness and digital well-being concepts into the educational process contributes to the development of professional competence among future teachers, supports their psychological well-being, and promotes effective and responsible use of digital technologies.

Keywords: digital mindfulness, digital well-being, professional competence, future teachers, digital education, mental health, digital environment, educational technologies.

KIRISH

So'nggi yillarda raqamli texnologiyalarning jadal rivojlanishi ta'lim tizimi va jamiyat hayotining barcha sohalariga sezilarli ta'sir ko'rsatmoqda. Internet, mobil qurilmalar, ijtimoiy tarmoqlar hamda turli raqamli platformalarning keng qo'llanilishi natijasida axborot almashinuvi va bilim olish jarayoni yanada tezlashdi. Biroq raqamli muhitning kengayishi bilan bir qatorda uning inson psixologik holati va ruhiy farovonligiga ta'siri masalasi ham dolzarb muammolardan biriga aylanmoqda. Ayniqsa, talaba-yoshlar va bo'lajak mutaxassislar orasida stress, tashvish va ruhiy zo'riqish holatlarining ortib borayotgani ilmiy tadqiqotlarda qayd etilmoqda.

Xalqaro tadqiqotlar natijalariga ko'ra, turli mamlakatlarda o'qiyotgan talabalarning muayyan qismi hayotining ma'lum davrida ruhiy salomatlik bilan bog'liq muammolarni boshdan kechiradi. Bu muammolar ko'pincha stress, depressiya, tashvish yoki psixologik zo'riqish kabi holatlar bilan namoyon bo'ladi. Talabalar o'rtasida bunday holatlarning yuzaga kelishiga akademik yuklama, imtihon bosimi, muvaffaqiyatsizlikdan qo'rquv, moliyaviy muammolar, oiladan uzoqda yashash hamda ta'lim jarayonining intensivligi kabi omillar sabab bo'lishi mumkin. Bundan tashqari, so'nggi yillarda ta'lim jarayonining raqamli muhitga o'tishi, xususan

pandemiya davrida onlayn ta'lim shaklining keng qo'llanilishi ham talabalarning ruhiy holatiga ma'lum darajada ta'sir ko'rsatdi.

Ruhiy salomatlikning buzilishi nafaqat shaxsiy hayot sifatiga, balki ta'lim jarayonining samaradorligiga ham salbiy ta'sir ko'rsatadi. Stress va psixologik muammolar talabalarning akademik natijalariga, emotsional boshqaruviga hamda ijtimoiy munosabatlariga ta'sir qilib, ayrim hollarda ta'lim jarayonidan chekinish yoki o'qishni tark etish xavfini ham keltirib chiqarishi mumkin. Shu sababli talabalarning ruhiy farovonligini ta'minlash hamda stressni kamaytirishga qaratilgan samarali pedagogik va psixologik yondashuvlarni ishlab chiqish muhim ahamiyat kasb etadi.

So'nggi yillarda bunday muammolarni hal etishda mindfulness yondashuvi keng qo'llanila boshladi. Mindfulness insonning hozirgi lahzani ongli ravishda idrok etishi, o'z fikr va his-tuyg'ularini baholamasdan qabul qilishi bilan bog'liq psixologik amaliyot hisoblanadi. Tadqiqotlar shuni ko'rsatadiki, mindfulness texnikalaridan foydalanish stressni kamaytirish, emotsional barqarorlikni oshirish hamda psixologik farovonlikni mustahkamlashga yordam beradi. Raqamli texnologiyalarning rivojlanishi esa ushbu yondashuvni yangi bosqichga olib chiqib, digital mindfulness tushunchasining shakllanishiga sabab bo'ldi.

Digital mindfulness an'anaviy mindfulness amaliyotlarini zamonaviy raqamli texnologiyalar bilan uyg'unlashtirgan holda insonning texnologiyadan ongli va muvozanatli foydalanishini ta'minlashga qaratilgan. Mobil ilovalar, onlayn maslahat xizmatlari, audio va video asosidagi meditatsiya dasturlari orqali foydalanuvchilarga psixologik qo'llab-quvvatlash ko'rsatish imkoniyati kengaymoqda. Shu bilan birga, digital mindfulness raqamli muhitda yuzaga keladigan ortiqcha axborot oqimi, diqqatning bo'linishi va digital charchoq kabi muammolarni kamaytirishga ham xizmat qiladi.

Ayniqsa, raqamli texnologiyalar keng qo'llanilayotgan zamonaviy ta'lim tizimida bo'lajak o'qituvchilarning digital mindfulness va digital wellbeing ko'nikmalariga ega bo'lishi muhim hisoblanadi. Chunki kelajak o'qituvchilari nafaqat o'zlarining raqamli muhitdagi faoliyatini samarali tashkil etishi, balki o'quvchilarning ham sog'lom va muvozanatli raqamli madaniyatini shakllantirishda muhim rol o'ynaydi. Shu nuqtai nazardan, digital mindfulness va digital wellbeing konsepsiyalarini pedagogik jarayonga integratsiya qilish bo'lajak o'qituvchilarning kasbiy kompetensiyasini rivojlantirishda muhim nazariy va amaliy ahamiyatga ega.

Shu sababli ushbu tadqiqotning asosiy maqsadi bo'lajak o'qituvchilarda digital mindfulness va digital wellbeing asosida kasbiy kompetensiyani rivojlantirishning

nazariy asoslarini tahlil qilish hamda ularning ta'lim jarayonidagi ahamiyatini yoritishdan iborat.

METODOLOGIYA

Mazkur tadqiqot bo'lajak o'qituvchilarda digital mindfulness va digital wellbeing asosida kasbiy kompetensiyani rivojlantirishning nazariy asoslarini aniqlash va ilmiy jihatdan tahlil qilishga qaratilgan. Tadqiqot jarayonida mavjud ilmiy manbalarni tizimli ravishda o'rganish, tahlil qilish hamda umumlashtirish maqsadida **scoping review** metodologiyasidan foydalanildi. Ushbu metodologiya ilmiy adabiyotlarda keng qo'llaniladigan usullardan biri bo'lib, u muayyan ilmiy muammo doirasida mavjud bo'lgan tadqiqot natijalarini keng qamrovda tahlil qilish, ularni tizimlashtirish hamda ilmiy bo'shliqlarni aniqlash imkonini beradi. Scoping review yondashuvi ayniqsa yangi shakllanayotgan ilmiy yo'nalishlar, jumladan digital mindfulness va digital wellbeing kabi zamonaviy konsepsiyalarni o'rganishda samarali hisoblanadi.

Tadqiqot jarayonida ilmiy manbalarni tanlash va tahlil qilish **PRISMA for Scoping Review (PRISMA-ScR)** metodologik tavsiyalariga muvofiq amalga oshirildi. Ushbu metodologik yondashuv ilmiy manbalarni tanlash, saralash va tahlil qilish jarayonini aniq bosqichlarga ajratish orqali tadqiqotning ilmiy ishonchliligi va shaffofligini ta'minlashga xizmat qiladi. PRISMA metodologiyasi asosida tadqiqot bir necha bosqichda amalga oshirildi: tadqiqot savollarini aniqlash, adabiyotlarni izlash strategiyasini ishlab chiqish, maqolalarni tanlash mezonlarini belgilash, tanlangan manbalarni tahlil qilish va yakuniy natijalarni umumlashtirish.

Tadqiqotning dastlabki bosqichida ilmiy izlanish yo'nalishi aniqlanib, quyidagi asosiy tadqiqot savollari shakllantirildi:

digital mindfulness va digital wellbeing tushunchalari talabalarning ruhiy farovonligiga qanday ta'sir ko'rsatadi;

raqamli muhitda ongli texnologiya foydalanish ko'nikmalarini shakllantirish bo'lajak o'qituvchilarning kasbiy kompetensiyasiga qanday ta'sir qiladi;

digital mindfulness texnologiyalari ta'lim jarayonida qanday pedagogik imkoniyatlarni yaratadi.

Ilmiy manbalarni izlash jarayoni yetakchi xalqaro ilmiy ma'lumotlar bazalarida amalga oshirildi. Xususan, **Scopus, PubMed va CINAHL** kabi ilmiy bazalardan foydalanildi. Ushbu bazalar tanlanishining asosiy sababi ularning xalqaro ilmiy jurnallarni qamrab olishi hamda ta'lim, psixologiya, sog'liqni saqlash va ijtimoiy fanlar bo'yicha ko'plab ilmiy tadqiqotlarni o'z ichiga olganidir. Ilmiy manbalarni izlash jarayonida bir nechta kalit so'z va iboralar kombinatsiyasidan foydalanildi. Jumladan: "digital mindfulness", "technology mindfulness", "mindfulness apps",

“digital wellbeing”, “mental health”, “students”, “college students” kabi kalit soʻzlar qoʻllanildi. Ushbu kalit soʻzlar turli kombinatsiyalarda qoʻllanilib, ilmiy manbalarni keng qamrovda aniqlash imkonini berdi.

Tadqiqot doirasida maqolalarni tanlash jarayonida **PCC (Population–Concept–Context)** modeli asos qilib olindi. Ushbu model tadqiqotning metodologik asosini belgilashda muhim ahamiyat kasb etadi. Mazkur modelga koʻra, tadqiqotning asosiy elementi sifatida quyidagilar belgilandi:

Population – talabalar va boʻlajak oʻqituvchilar;
Concept – digital mindfulness, digital wellbeing va ongli texnologiya foydalanish;
Context – taʼlim jarayoni, ruhiy salomatlik va kasbiy kompetensiyani rivojlantirish.

Ilmiy manbalarni tanlash jarayonida maʼlum **inklyuziya va eksklyuziya mezonlari** ham belgilandi. Tadqiqotga soʻnggi oʻn yil davomida chop etilgan, ingliz tilida nashr qilingan, toʻliq matnli hamda empirik yoki nazariy tadqiqot natijalarini oʻz ichiga olgan ilmiy maqolalar kiritildi. Bundan tashqari, eksperimental, kvazi-eksperimental yoki tizimli tahlil metodlariga asoslangan ilmiy ishlar alohida eʼtiborga olindi. Shu bilan birga, tadqiqot obʼekti talabalar boʻlmagan yoki mindfulness texnologiyalaridan foydalanilmagan ilmiy ishlar tadqiqotdan chiqarib tashlandi.

Tanlab olingan ilmiy maqolalar chuqur tahlil qilinib, ulardan muhim maʼlumotlar **maʼlumotlarni ajratib olish (data extraction)** jarayoni orqali tizimlashtirildi. Ushbu jarayonda har bir maqola boʻyicha mualliflar, chop etilgan yil, tadqiqot oʻtkazilgan mamlakat, tadqiqot dizayni, ishtirokchilar soni, qoʻllanilgan digital mindfulness texnologiyalari hamda asosiy tadqiqot natijalari alohida jadvalda aks ettirildi. Mazkur yondashuv turli tadqiqotlar natijalarini solishtirish hamda ular orasidagi umumiy tendensiyalarni aniqlash imkonini berdi.

Tadqiqot natijalarining ishonchliligini taʼminlash maqsadida maqolalarni baholash jarayoni ikki nafar tadqiqotchi tomonidan mustaqil ravishda amalga oshirildi. Baholash jarayonida maqolalarning metodologik asoslanganligi, empirik dalillarining yetarliligi, tadqiqot natijalarining ilmiy asoslanganligi hamda nazariy model bilan mosligi eʼtiborga olindi. Agar baholash jarayonida turli fikrlar yuzaga kelgan boʻlsa, tadqiqotchilar oʻrtasida muhokama oʻtkazilib, yakuniy qarorga kelindi.

Tadqiqotda nazariy asos sifatida **digital wellbeing konseptual modeli** ham qoʻllanildi. Ushbu modelga koʻra, insonning raqamli texnologiyalardan foydalanish tajribasi uning subyektiv farovonligi bilan bevosita bogʻliq boʻlib, raqamli faoliyat natijasida ham ijobiy, ham salbiy taʼsirlar yuzaga kelishi mumkin. Raqamli muhitda texnologiyalardan haddan tashqari foydalanish stress, axborot ortiqchaligi va digital charchoq kabi muammolarni keltirib chiqarishi mumkin. Shu bilan birga,

texnologiyalardan ongli va maqsadli foydalanish ijtimoiy aloqalarni mustahkamlash, axborotga tezkor kirish imkoniyatini yaratish hamda kasbiy rivojlanishga yordam beradi.

Digital mindfulness konsepsiyasi aynan raqamli texnologiyalardan ongli foydalanish ko'nikmalarini shakllantirishga qaratilgan bo'lib, u insonning diqqatini boshqarish, texnologiya bilan ishlash jarayonida reflektiv fikrlashni rivojlantirish hamda raqamli muhitda psixologik muvozanatni saqlashga yordam beradi. Shu sababli digital mindfulness va digital wellbeing yondashuvlari bo'lajak o'qituvchilarning kasbiy kompetensiyasini rivojlantirishda muhim nazariy asoslardan biri sifatida qaraladi.

Mazkur metodologik yondashuv orqali digital mindfulness va digital wellbeing tushunchalarining ta'lim jarayonidagi o'rni hamda bo'lajak o'qituvchilarning kasbiy kompetensiyasini rivojlantirishdagi ahamiyati ilmiy jihatdan tahlil qilindi. Tadqiqot natijalari kelgusida raqamli muhitda pedagogik faoliyatni samarali tashkil etish, o'qituvchilarning psixologik farovonligini ta'minlash hamda ta'lim jarayonida raqamli texnologiyalardan ongli foydalanish bo'yicha metodik tavsiyalar ishlab chiqishga xizmat qiladi.

NATIJA VA MUHOKAMA

Tadqiqot natijalari shuni ko'rsatadiki, raqamli texnologiyalarning keng qo'llanilishi zamonaviy ta'lim muhitida yangi imkoniyatlar bilan bir qatorda bir qator muammolarni ham yuzaga keltirmoqda. Raqamli vositalardan haddan tashqari foydalanish diqqatning pasayishi, psixologik zo'riqish, informatsion ortiqcha yuklama hamda digital charchoq kabi holatlarni keltirib chiqarishi mumkin. Bunday holatlar nafaqat shaxsning ruhiy farovonligiga, balki uning kasbiy faoliyat samaradorligiga ham salbiy ta'sir ko'rsatadi. Ayniqsa, bo'lajak o'qituvchilar uchun raqamli muhitda ishlash ko'nikmalarini to'g'ri shakllantirish muhim ahamiyat kasb etadi, chunki ular kelajakda ta'lim jarayonini tashkil etishda raqamli texnologiyalardan faol foydalanadilar.

Tadqiqot jarayonida tahlil qilingan ilmiy manbalar digital mindfulness va digital wellbeing tushunchalarining pedagogik faoliyatda muhim rol o'ynashini ko'rsatdi. Digital mindfulness raqamli texnologiyalardan ongli va maqsadli foydalanishni anglatib, texnologiya bilan ishlash jarayonida diqqatni boshqarish, reflektiv fikrlash hamda raqamli faoliyatni tahlil qilish ko'nikmalarini shakllantirishga yordam beradi. Bu esa o'z navbatida raqamli muhitda yuzaga keladigan stress va charchoqni kamaytirish imkonini yaratadi. Tadqiqotlar shuni ko'rsatadiki, reflektiv fikrlash elementlari bilan uyg'unlashgan digital mindfulness texnologiyadan foydalanish

samaradorligini oshiradi hamda texnologiyaga nisbatan ongli yondashuvni shakllantiradi.

Natijalar shuni ko'rsatdiki, digital mindfulness amaliyotlari texnologiyadan foydalanishni cheklash emas, balki undan maqsadga muvofiq va optimal foydalanishni nazarda tutadi. Texnologiyadan ongli foydalanish jarayonida shaxs zarur bo'lgan raqamli vositalarni tanlab ishlatadi, ortiqcha axborot oqimini kamaytiradi hamda diqqatini asosiy faoliyatga qaratadi. Bu yondashuv bo'lajak o'qituvchilarning kasbiy kompetensiyasini rivojlantirishda muhim omil bo'lib xizmat qiladi. Chunki zamonaviy pedagogdan nafaqat fan bo'yicha bilim, balki raqamli muhitda samarali faoliyat yuritish, texnologiyalarni tanqidiy tahlil qilish va ularni maqsadga muvofiq qo'llash kabi ko'nikmalar ham talab etiladi.

Tahlil natijalari shuni ham ko'rsatdiki, digital wellbeing tushunchasi shaxsning raqamli muhitdagi umumiy farovonligini ifodalaydi. Raqamli texnologiyalardan foydalanish jarayonida inson bir vaqtning o'zida ham ijobiy, ham salbiy tajribalarni boshdan kechirishi mumkin. Masalan, raqamli platformalar orqali axborot olish, ijtimoiy aloqalarni kengaytirish va ta'lim resurslaridan foydalanish imkoniyatlari kengayadi. Shu bilan birga, ortiqcha ekran vaqti, informatsion bosim va diqqatning bo'linishi kabi omillar shaxsning ruhiy holatiga salbiy ta'sir ko'rsatishi mumkin. Shu sababli digital wellbeing konsepsiyasi raqamli texnologiyalarni inson farovonligiga xizmat qiladigan tarzda boshqarishni nazarda tutadi.

Shuningdek, tadqiqot natijalari digital mindfulness va reflektiv fikrlash o'rtasidagi bog'liqlikni ham ko'rsatdi. Refleksiya jarayoni shaxsga o'zining texnologiyadan foydalanish tajribasini tahlil qilish, oldingi faoliyat natijalarini baholash va kelajakdagi qarorlarini yanada ongli ravishda qabul qilish imkonini beradi. Agar texnologiyadan foydalanish refleksiya bilan uyg'unlashmasa, u holda foydalanish odatiy va avtomatik xarakterga ega bo'lib qolishi mumkin. Bu esa texnologiyadan maqsadsiz foydalanishga va digital charchoqning ortishiga olib keladi. Shu sababli digital mindfulness amaliyotlari reflektiv tahlil bilan birgalikda qo'llanilganda yanada samarali natija beradi.

Tadqiqot natijalari shuni ko'rsatadiki, raqamli muhitda kasbiy faoliyat olib boruvchi pedagoglar uchun digital mindfulness va digital wellbeing ko'nikmalarini shakllantirish muhim hisoblanadi. Bu ko'nikmalar o'qituvchilarga texnologiyadan samarali foydalanish, ortiqcha axborot oqimini boshqarish hamda o'zlarining psixologik barqarorligini saqlashga yordam beradi. Bundan tashqari, bunday ko'nikmalar pedagoglarga o'quvchilarda ham sog'lom raqamli madaniyatni shakllantirish imkonini yaratadi.

Umuman olganda, tadqiqot natijalari digital mindfulness va digital wellbeing konsepsiyalarini pedagogik faoliyatga integratsiya qilish bo'lajak o'qituvchilarning kasbiy kompetensiyasini rivojlantirishda muhim ahamiyatga ega ekanligini ko'rsatdi. Raqamli texnologiyalar sharoitida pedagogik faoliyat samaradorligini oshirish uchun texnologiyadan ongli foydalanish, reflektiv tahlil va raqamli farovonlikni ta'minlashga qaratilgan yondashuvlarni ta'lim jarayoniga joriy etish zarur hisoblanadi.

XULOSA

Mazkur tadqiqotda bo'lajak o'qituvchilarda digital mindfulness va digital wellbeing asosida kasbiy kompetensiyani rivojlantirishning nazariy asoslari tahlil qilindi. Tadqiqot natijalari shuni ko'rsatdiki, raqamli texnologiyalarning jadal rivojlanishi ta'lim tizimida yangi imkoniyatlarni yaratish bilan bir qatorda, insonlarning psixologik holati va ruhiy farovonligiga ham sezilarli ta'sir ko'rsatmoqda. Raqamli muhitda texnologiyalardan haddan tashqari foydalanish informatsion ortiqcha yuklama, diqqatning pasayishi hamda digital charchoq kabi muammolarni yuzaga keltirishi mumkin. Shu sababli raqamli texnologiyalardan ongli va muvozanatli foydalanish ko'nikmalarini shakllantirish zamonaviy pedagogik faoliyatning muhim yo'nalishlaridan biri hisoblanadi.

Tadqiqot davomida digital mindfulness va digital wellbeing tushunchalari pedagogik jarayonda bo'lajak o'qituvchilarning kasbiy kompetensiyasini rivojlantirishda muhim nazariy asos bo'lib xizmat qilishi aniqlandi. Digital mindfulness texnologiyalardan ongli foydalanish, diqqatni boshqarish va reflektiv fikrlash ko'nikmalarini rivojlantirishga yordam beradi. Digital wellbeing esa shaxsning raqamli muhitdagi umumiy farovonligini ta'minlash, stress va psixologik zo'riqlashlarning oldini olish hamda raqamli texnologiyalardan samarali foydalanish imkonini yaratadi.

Shuningdek, tadqiqot natijalari digital mindfulness amaliyotlarini reflektiv tahlil bilan uyg'unlashtirish texnologiyadan foydalanish samaradorligini oshirishini ko'rsatdi. Refleksiya orqali bo'lajak o'qituvchilar o'zlarining raqamli faoliyatini tahlil qilish, texnologiyadan foydalanish strategiyalarini takomillashtirish hamda raqamli muhitda ongli qarorlar qabul qilish imkoniyatiga ega bo'ladilar. Bu esa nafaqat ularning kasbiy kompetensiyasini rivojlantiradi, balki pedagogik faoliyat samaradorligini ham oshiradi.

Umuman olganda, digital mindfulness va digital wellbeing konsepsiyalarini ta'lim jarayoniga integratsiya qilish bo'lajak o'qituvchilarning kasbiy kompetensiyasini rivojlantirish, ularning psixologik barqarorligini ta'minlash hamda

raqamli texnologiyalardan samarali foydalanish ko'nikmalarini shakllantirishda muhim ahamiyatga ega. Shu sababli pedagog kadrlarni tayyorlash jarayonida raqamli muhitda ongli texnologiya foydalanish madaniyatini shakllantirishga qaratilgan metodik yondashuvlarni ishlab chiqish va amaliyotga joriy etish dolzarb vazifa hisoblanadi.

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СТРУКТУРНЫЕ ОСНОВЫ НЕЙРОСЕКРЕЦИИ В ГИПОТАЛАМУСЕ.

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Абстрактный. В развитых странах смертность от нейродегенеративных и цереброваскулярных заболеваний в структуре общей летальности занимает 2–3-е места, в России наблюдается схожая ситуация. За последние 5 лет только в Российской Федерации от болезней системы кровообращения умерли 6,4 миллиона человек, что позволяет считать эту патологию глобальной эпидемией. Инсульт является лидирующей причиной инвалидизации населения. По данным Национального регистра инсульта, 31 % перенесших инсульт больных нуждаются в посторонней помощи, 20 % не могут самостоятельно ходить, что ставит эту проблему в ряд социально значимых. Лишь 8 % выживших больных могут вернуться к прежней работе.

Ключевые слова: охлаждение, гипоталамус, АКТГ, норадреналин, кортизол.

Учитывая то, что нейроны гипоталамуса играют важную роль в регуляции водно-солевого обмена и артериального давления, необходимость изучения взаимодействия гипоталамуса и высших отделов ЦНС в норме и при патологии в настоящее время бесспорна.

Нейроэндокринология сегодня располагает большим количеством взаимоисключающих фактов, воззрений, гипотез и концепций относительно функциональной роли отдельных гипоталамических ядер и гистофизиологического смысла тех или иных структурных изменений в секреторных нейронах в возрастном аспекте и при ишемиях. Тем не менее

остаются малопонятными вопросы специфичности морфологических изменений в гипоталамусе.

Одним из спорных вопросов является роль в индукции апоптоза нейронов липофусцина, обнаруженного в ткани мозга у людей различных возрастных групп. Наименее изученными и противоречивыми являются вопросы о липофусциновых гранулах в нейросекреторных клетках гипоталамуса человека. Утверждение о липофусцине как пигменте старения сменилось на точку зрения о его защитной роли. Противоречивость знаний о химическом составе, источниках и механизмах образования липофусцина обусловила проведение многочисленных работ с анализом полученного материала на различных уровнях. Осмиофильность гранул позволила отнести липофусцин к липидным включениям, но имеются и данные, отрицающие принадлежность липофусцина нейронов к этому классу веществ. Некоторые авторы утверждают, что липофусцин, как и меланин, является производным тирозина. Наличие в составе гранул липофусцина митохондриальных ферментов позволило считать их производными митохондрий, присутствие кислой фосфатазы – предположить, что они происходят из лизосом, являются резидуальными тельцами, которые не реагируют на лизосомальные ферменты.

Некоторые авторы считают, что это пигмент «старения» нейрона и связан он с процессами неполного расщепления веществ в лизосомах. По теории S.E. Toth (1968), в генезе гранул липофусцина участвуют митохондрии и гранулярная ЭПС, которые после упаковки в диктиосомах комплекса Гольджи приобретают вид гранул. Xue Q., Hou J., Li Y. (1992) и Okamoto K., Hirai S., Amari M., Watanabe M., Sakurai A. (2013) утверждают источниками, ответственными за формирование липофусциновых гранул, только диктиосомы комплекса Гольджи (2013). Markelic M., Velickovic K., Golic I., Klepal W., Otasevic V., Stancic A., Jankovic A., Vucetic M., Buzadzic B., Korac B., Korac A. (2013) считают липофусцин результатом слияния липидных капель и митохондрий с лизосомами. Противники состоятельности теории S.E. Toth считают накопление липофусцина генетически запрограммированным и отрицают его образование и накопление как результат метаболической поломки органелл в клетке.

Наличие незначительных исследований на материале человека, отсутствие системного анализа, как в возрастном аспекте, так и при патологии, оставляют проблему роли липофусцина в норме и при инсультах открытой, что диктует

продолжение работ в этом направлении. Современные данные о неоднозначной роли липофусцина в метаболизме нервных клеток и отсутствие исчерпывающих доказательств его участия в физиологической и репаративной регенерации нейронов мозга диктуют необходимость проведения исследований именно морфологического характера.

Целью исследования является предупреждение геронтологических изменений нейронов головного мозга и повышение эффективности лечения больных после инсульта. Соответственно цели были поставлены следующие задачи:

1. Изучить морфологию нейронов переднего гипоталамуса человека после инсульта.
2. Получить характеристику липофусцинсодержащих нейронов ядер переднего гипоталамуса на фоне хронической ишемии.
3. Установить топографические особенности распределения нейронов гипоталамуса, содержащих гранулы липофусцина, и их взаимоотношения с кровеносными сосудами.

Материалы и методы исследования

В работе проанализирован материал биоптатов дна и боковых стенок третьего желудочка у 14 пациентов мужского пола различных возрастных групп, умерших от инсульта, полученный в соответствии с приказом Минздравмедпрома РФ от 29.04.94 N 82 «О порядке проведения патологоанатомических вскрытий», по правилам регламентирующей инструкции о порядке вскрытий трупов в лечебных учреждениях. Группу контроля составили 28 пациентов, погибших в результате травм, несовместимых с жизнью, предположительно без соматической патологии в возрасте от 24 до 76 лет. Биопсийный материал гипоталамуса фиксировался по прописи для подготовки к иммуногистохимическим исследованиям сразу после забора. Исключение возможных артефактов основано на данных, полученных при специальном исследовании на собаках, свидетельствующих, что при сохранении трупов при температуре 7 °С до 4–6 часов в морфологии гипоталамо-гипофизарной нейросекреторной системы микроскопически видимых

изменений не наблюдается, кроме некоторого снижения интенсивности специфических реакций на нейросекрет.

Использованы классические гистологические методы исследования с окрашиванием гематоксилин-эозином для получения общей морфологической картины нейронов переднего гипоталамуса человека. Анализ материала проведён с помощью микроскопа Olympus – Vx82 и цифровой камеры CDx82 с фирменным программным обеспечением.

Результаты исследования и их обсуждение

В наших исследованиях нейроны передних ядер гипоталамуса имеют крупные размеры, достигая 100–120 мкм. Ядро круглой формы с эу- и гетерохроматином, либо равномерно распределённым в кариоплазме, либо расположенным в виде кольца по периферии (рис. 1, а, б). У части нейронов имеется светлоокрашенное перинуклеарное пространство, которое может свидетельствовать о вступлении нейрона в апоптоз. Мелкоклеточная глия равномерно распределяется вокруг нейронов (рис. 1, в).

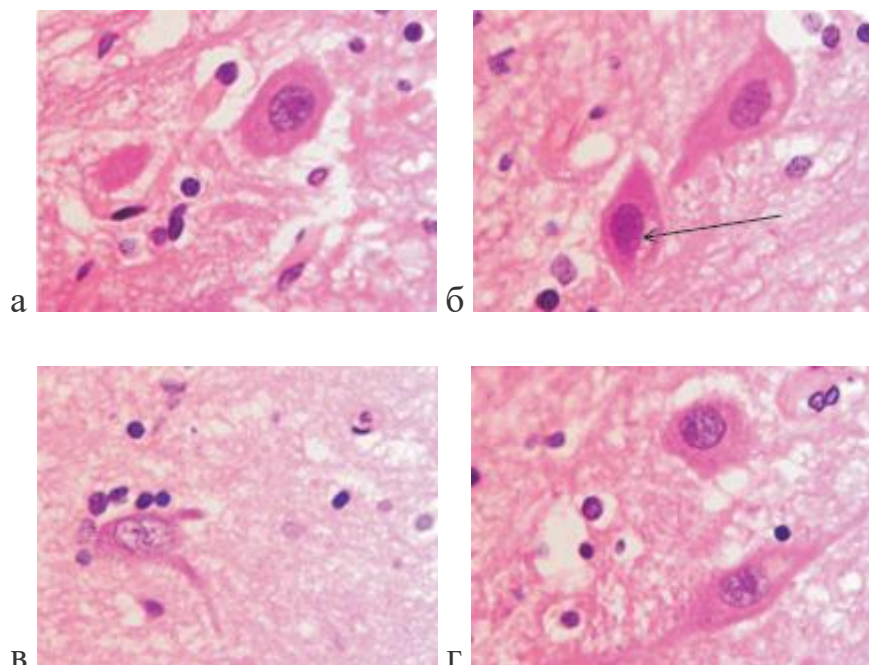


Рис. 1. Нейроны переднего гипоталамуса. Окраска г/э. Микрофото. Ув.х1000: а – эу- и гетерохроматин в ядре распределён неравномерно, по периферии и в центре, в нуклеоплазме идентифицируются глыбки хроматина; б – хроматин распределён равномерно, но ядро окружено светлым кольцом перинуклеарного пространства (указано стрелкой)

Кровеносные сосуды микроциркуляторного русла изученного нами гипоталамуса не образуют структур гематоэнцефалического барьера, как в других отделах головного мозга. Стенка капилляров представлена плоскими вытянутыми эндотелиоцитами с соответствующей вытянутой формой ярко базофильных ядер (рис. 2, а-е).

Нами отмечено, что диаметр капилляров достигает 10 мкм, в состав стенки более крупных капилляров входят перициты, располагающиеся в расщеплениях базальной мембраны (рис. 2, д, е).

Установлено, что в результате хронической ишемии и развившегося обширного инсульта в области прецентральной извилины мозга человека в нейронах переднего гипоталамуса накапливаются крупные гранулы липофусцина, заполняющие всю цитоплазму вокруг ядра (рис. 3, а). Следует отметить, что гранулы представлены мелкозернистой (до 0,68 мкм) ярко окрашенной субстанцией с высокой оптической плотностью. При этом ядро может занимать один из полюсов клетки, базофилия нуклеоплазмы снижена по сравнению с клетками, лишёнными гранул. Ядро приобретает сетчатое строение с чётко идентифицирующимся в центре шаровидным уплотнением хроматина, вокруг которого располагается базофильное кольцо. От кольца идут тонкие нити, достигающие кариолеммы и придающие ядру в целом вид колеса со спицами (рис. 3, б). Некоторые клетки на одном из полюсов содержат ядра, на другом сосредоточены секреторные гранулы (рис. 3 в), а в некоторых гранулы расположены значительными фрагментами (рис. 3, г). Это может быть результатом либо накопления включений в динамике, либо результатом постепенного неполного освобождения цитоплазмы от гранул. Часть клеток содержит ядра с чёткими контурами (рис. 3 а, б), но в большей части клеток нуклеолема разрушена (рис. 3, в-е), хроматин распределён хаотично, ядрышки не идентифицируются, как в исследованиях Sendrowski K., Sobaniec W., Sobaniec P., Sobaniec-Lotowska M.E. (2013) [20], относящих, как и мы, этот вид дегенерации клеток к апонекрозу.

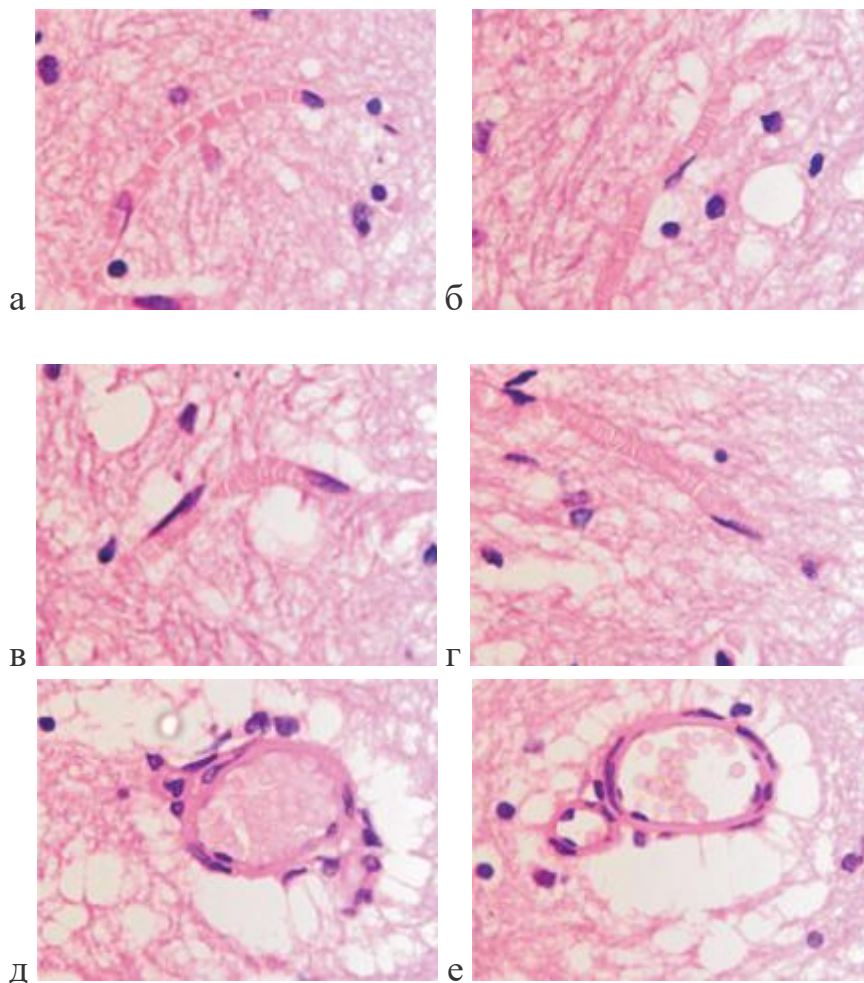
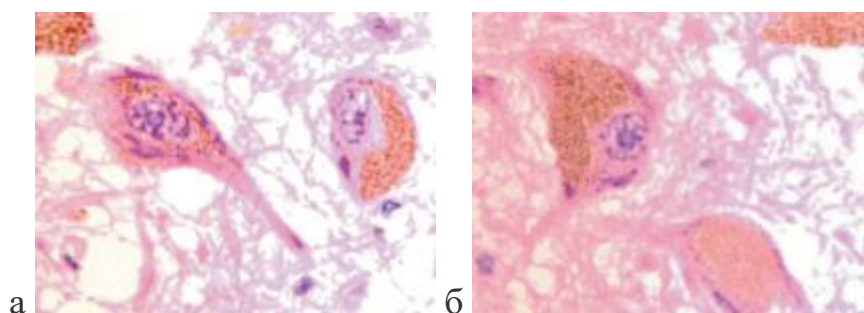


Рис. 2. Микроциркуляторное русло гипоталамуса человека. Окраска г/э. Микрофото. Ув. х600

В нейронах переднего гипоталамуса структура ядер свидетельствует о различном уровне дезорганизации хроматина, разрушении ядерной оболочки, апоптозе нейронов (рис. 3, д). Гранулы приобретают более тёмный коричневый цвет (рис. 3, е). В некоторых клетках вся цитоплазма заполнена гранулами, ядра не идентифицируются. Приобретение резкой базофилии окружающей нейроны глиии свидетельствует об апоптозе.



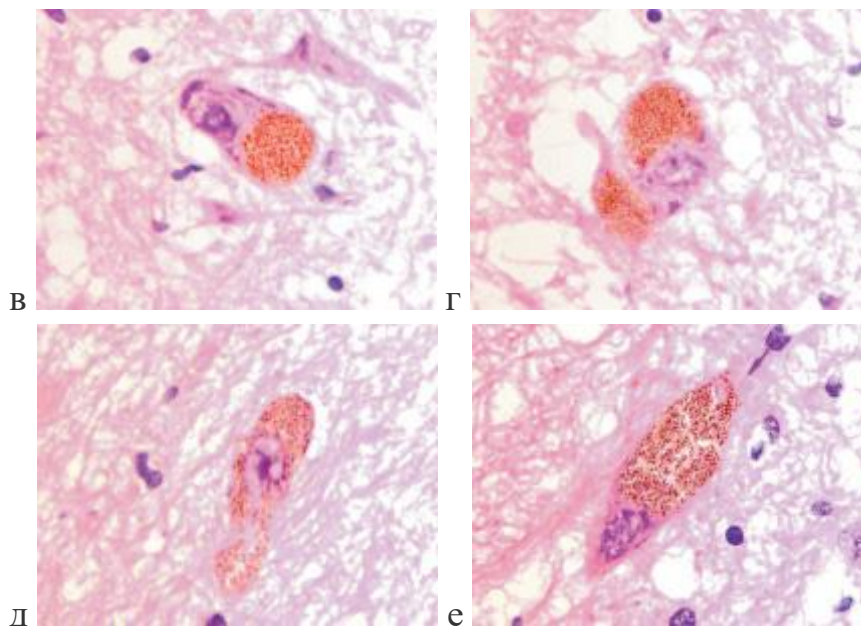


Рис. 3. Нейроны переднего гипоталамуса при ишемическом инсульте в области прецентральной извилины. Окраска г/э. Микрофото. Ув. x1000: а – в клетке слева зернистые включения располагаются равномерно вокруг ядра, а в расположенном рядом нейроне – на одной стороне вдоль длинной оси клетки; б – клетка с гранулами на одном из полюсов, ядро в виде колеса со спицами; в – клетка резко полярна, гранулы располагаются на одном из полюсов; г, д – гранулы располагаются в одном или двух фрагментах на противоположных полюсах клетки; д, е – вытянутая форма клеток со смещением ядра в один из полюсов, гранулы тёмно-коричневого цвета

Нами выделены 4 типа гранулосодержащих клеток: клетки 1 типа, практически лишенные гранул, по нашему мнению, наиболее активно выводящие нейросекрет; клетки 2 типа с умеренным темпом выведения нейросекрета и потому содержащие его гранулы в небольшом количестве в перинуклеарной зоне; клетки 3 типа с пониженной активностью выведения нейросекрета и цитоплазмой, переполненной гранулами. 4-й тип соответствует апоптозирующим нейронам. Наши данные частично согласуются с данными Braak H., Braak E. (1987), которые при окрашивании нейронов по Нисслию также выделили четыре типа нейронов на основе размеров гранул [2]. Клетки I типа, по их данным, содержат крупные гранулы интенсивно окрашенного липофусцина. Клетки II типа характеризуются наличием плотных скоплений мелких гранул. III тип нейронов содержит рассеянные пылевидные гранулы, в то время как IV тип нейронов лишен пигмента. По нашим данным изменяется не размер гранул, а их количество в цитоплазме нейронов, отражающее секреторную активность

клеток. Поэтому мы считаем, что наличие одинаковой величины гранул может подтверждать, что это результат накопления секрета в определённых структурах типа лизосом, как и в исследованиях Feeney E.J., Austin S., Chien Y.H., Mandel H., Schoser B., Prater S., Hwu W.L., Ralston E., Kishnani P.S., Raben N. (2014), предположивших, что накопление липофусцина – результат неэффективных лизосомальных деградаций.

Заключение

Особенностями нейронов гипоталамуса являются чувствительность к составу омывающей их крови, отсутствие гематоэнцефалического барьера между нейронами и кровью, способность нейронов к нейросекреции пептидов, нейромедиаторов. Возбуждение ядер передней группы гипоталамуса приводит к реакции организма по парасимпатическому типу, т.е. реакциям, направленным на восстановление и сохранение резервов организма. Различные виды артериальной гипертензии, развивающиеся после стимуляции гипоталамуса, обусловлены комбинированным влиянием симпатической части вегетативной нервной системы и выделением адреналина надпочечниками, хотя в данном случае нельзя исключить влияние нейрогипофиза в генезе устойчивой артериальной гипертензии. В экспериментах на животных установлено, что при острой гипоксии различной этиологии (ишемии, вызванной кровопотерей или перевязкой сосудов, питающих мозг, при уменьшении парциального давления кислорода в барокамере) увеличивается содержание нейросекрета в нейронах супраоптического и паравентрикулярного ядер, что, вероятно, следует рассматривать как признак, указывающий на подавление секреторной активности. Принято считать, что липофусцин накапливается в ущерб синтетической функции клеток. Хроническая гипоксия, сопутствующая кровопотере, и связанная с ней дегидратация явились в эксперименте причиной повышенной функции нейронов. Аналогичный характер изменений со стороны нейросекреторных ядер переднего гипоталамуса у лиц, умерших от острой кровопотери, наблюдали и другие авторы, отметившие преобладание в «секреторной формуле» ядер гипоталамуса нейронов с морфологическими и цитохимическими признаками, типичными для фаз синтеза и гиперсекреции, при невысоком содержании клеток, находившихся на других фазах секреторного цикла. По мнению авторов, активация функции гипоталамо-нейрогипофизарной системы при острой кровопотере, по-видимому, направлена на развитие защитной вазоконстрикторной реакции периферического сосудистого русла.

Визуальная оценка состояния элементов, образующих супраоптические ядра при острой гипоксии в течение от 10 минут до 5 часов не приводит к каким-либо морфологическим сдвигам в нейронах паравентрикулярных ядер, однако отмечено, что высокая активность синтеза нейросекрета не соответствует темпам его выведения. В опытах с наложением лигатур на кровеносные сосуды было установлено, что уже на пятый день наблюдаются морфологические сдвиги в нейронах гипоталамуса с деструкцией части клеток. Хроническая ишемия структур мозга человека приводит к тому, что нейроны уменьшаются в размерах, часто имеют вытянутую форму, со значительным количеством гиперхромного секрета в цитоплазме; появляются дегенеративные («пикноморфные») нейросекреторные элементы, что наблюдалось и в наших исследованиях. В норме у человека преобладают клетки I типа; 2 и 3 типы содержатся в большем количестве в нейронах переднего гипоталамуса при хронической ишемии. Наши данные согласуются в этом отношении с результатами исследований других авторов, полученных в экспериментах на животных. При гипоксическом воздействии возрастает число нейронов с морфологическими признаками повышенной экстррузии нейросекреторных гранул. Они не только отнесли идентифицированные гранулы к производным митохондрий, но и к факторам старения. Как и в наших исследованиях, они наблюдали наличие гранул в микроглии, расположенной вблизи капилляров.

Многие авторы рассматривают накопление липофусцина в цитоплазме как явление, предшествующее апоптозу нейронов. Но факт его обнаружения в нейронах людей в возрасте 20 лет, погибших в результате причин, не связанных с ишемическим повреждением мозга, свидетельствует о накоплении липофусцина как физиологическом процессе, возможно, и для выполнения роли депо кислорода. Липофусцин накапливается в лизосомах, предполагается, что основной его источник – переваренные при аутофагии митохондрии. Исследования показали в гранулах липофусцина митохондриальные ферменты на разных стадиях образования, что является свидетельством повреждения липидной оксигенации клеточных мембран, а Fe-содержащий гемин, цитохром C и миоглобин рассматриваются как катализаторы этого процесса.

Несмотря на то, что в гранулах липофусцина 20–50 % жира, 30–60 % белков, 9–20 % – остаток чёрного цвета, до сих пор точно неизвестно, из каких продуктов белкового обмена образуется липофусцин; полагают, что из продуктов ядерного распада. В настоящее время появились данные Lubarsch,

Brahn, Schmidtman (1913), что липофусцин является пигментом белковой природы, жиры в нем являются лишь случайной примесью и могут отсутствовать вовсе, причем от этого меняются лишь некоторые микрохимические реакции. По своему качественному составу (C – 50,4 %, H – 5,9 %, N – 10,8 %, серы – 3,2 %) липофусцин крайне близко примыкает к другому белковому пигменту меланину и многими авторами даже идентифицируется с ним. Разграничение проводится лишь в той плоскости, что меланин – пигмент эктодермального происхождения, а липофусцин встречается также и в дериватах других зародышевых листков и поэтому, вероятно, химически несколько отличается от кожного меланина, для которого главным фактором синтеза являются ультрафиолетовые лучи.

Морфологически наши данные не вписываются в общую картину четырёх морфологических стадий старения нейронов. У молодых нейронов (1-я стадия – диффузная) – липофусцина мало и он рассеян по цитоплазме нейрона. У зрелых нервных клеток (2-я стадия, околядерная) – количество пигмента увеличивается и он начинает скапливаться в зоне ядра. У стареющих нейронов (3-я стадия – полярная), липофусцина все больше и больше и скопления его гранул концентрируются около одного из полюсов нейрона. И наконец, у старых нейронов (4-я стадия, биполярная), липофусцин заполняет большой объем цитоплазмы и его скопления находятся на противоположных полюсах нейрона. В ряде случаев липофусцина в клетке становится так много, что его гранулы деформируют ядро. Накопление липофусцина в процессе старения нейронов и организма связывают также со свойством липофусцина, как каротиноида, связывать кислород. Полагают, что таким образом нервная система адаптируется к происходящему с возрастом ухудшению кислородного питания клеток. В наших исследованиях все клетки содержали только крупные гранулы, степень заполнения цитоплазмы была различной, но в случае переполнения гранулами по всему объёму цитоплазмы сопровождалась смещением ядра к одному из полюсов. Изменения в ядре не носили классической картины апоптоза. В единичных клетках наблюдались инвагинации кариолеммы. Отмечено уменьшение плотности нейронов без увеличения количества глии, увеличивается содержание моноаминоксидазы, уменьшается содержание серотонина. Острая ишемия приводит к немедленной гибели нейронов от кислородного голодания. Но старой загадкой является вопрос, что происходит с нейронами в областях внешних по отношению к ядру зоны инсульта с уменьшенным, но не отсутствующим снабжением кислородом. Было показано, что картина умирания нейронов не полностью соответствует описанию апоптоза.

До середины 1990-х большинство исследователей считали, что нейроны, погибшие в ходе инсульта, умирают не в соответствии срабатывания обычной программы апоптоза, но просто за счет разрушения в процессе неконтролируемой формы смерти, некроза. По нашим данным многие клетки с гранулами имели признаки деструкции и разрушенные ядра с растворённым хроматином, что не совсем вписывается в морфологическую картину, характерную для апоптоза.

Выявленные нами нейроны, содержащие гранулы жёлто-коричневого цвета в цитоплазме, сохранившиеся после проводки материала по спиртам высокой концентрации для обезвоживания скорее всего имеют отношение к накоплению меланина. Кора головного мозга может оказывать тормозящий эффект на функции нейронов гипоталамуса, хотя расположенного не в зоне ишемии, но реагирующего на недостаток кислорода в крови путём снижения секреторной активности.

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Ni (II) NING 2,6-PIRIDINDIKARBON KISLOTASI VA MEA BILAN KOMPLEKS BIRIKMASI SINTEZI VA HIRSHFELD SIRTI TAHLILI

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Annotatsiya. 2,6-piridindikarbon kislotasining metall ionlari bilan ta'sirlashishi va uning metallokompleks birikmalarining xossalari tadqiq qilish maqsadida, Nikel(II) atsetat va MEA bilan M:L:L 1:2:2 nisbatdagi kompleks birikmasi sintez qilindi. Sintez qilingan kompleksning tarkibi va tuzilishi RTT yordamida aniqlandi. Molekulalararo o'zaro ta'sirlar xarakterini tavsiflash uchun Hirshfeld sirtini Crystal Explorer17.5 dasturi yordamida tahlil qilindi. Kompleksning UB spektroskopiyasi tahlili o'tkazildi.

Kalit so'zlar. 2,6-piridindikarbon kislotasi (2,6-PDCA, dipic), nikel(II) atsetat, MEA.

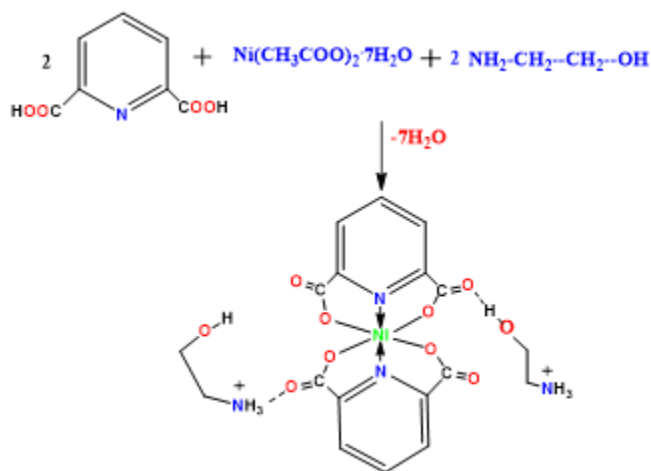
Kirish. 2,6-piridindikarbon kislotasi (2,6-PDCA, dipic) bir yoki bir nechta karboksilat kislorod atomlari orqali barqaror komplekslar hosil qiluvchi ko'p qirrali N, O-xelatlovchi, bidentat va tridentat xelatlovchi liganddir [1-4]. Qiziqishning sababi shundaki, ligand H₂pda va markaziy piridin halqasi va ikkita karboksilat guruhi o'rtasida qattiq 120 ° burchakka ega va shuning uchun hosil bo'lish uchun turli xil bog'lanish usullarini ta'minlay oladi [5].

So'nggi paytlarda monoetanolaminlar va oddiy bir o'rnini bosuvchi benzoy kislotalar asosidagi aralash ligandlardan tayyorlangan oltita muvofiqlashtirilgan mono- va ikki yadroli mis komplekslari, xususan, monoetanolamin (MEA) va p-nitroben kislotasi (p-nitrobenzo) va yuqori darajadagi mualliflar tomonidan nashr etilgan [Cu²⁺(MEA)₂] va [2Cu²⁺(MEA)₂(H₂O)₂]. Yann-Teller effekti tufayli buzilgan oktaedrik tuzilishli komplekslar . Bitta [Ni(dipic)₂](mea)₂ tarkibli yangi kompleks birikmaning monokristali piridin-2,6-dikarboksilik kislota (PDC yoki dipic) bilan (MEA) aralashgan holatda o'stirildi [6,7].

Hozirgi vaqtda kimyogarlar metall ionlariga birlashtirilgan donor atomlarining soniga qarab di, tri, tetra yoki ko'p ligandli komplekslar bo'lishi mumkin bo'lgan qiziqarli fizik-kimyoviy xossalari tufayli aralash ligand komplekslari bo'yicha keng qamrovli tadqiqotlar olib bormoqda[8-10].

Ushbu tadqiqot ishida biz bitta yangi kompleks haqida xabar berdik, $[\text{Ni}(\text{dipic})_2](\text{mea})_2$ (1-rasm) Piridin-2,6-dikarik kislotasi (mono) (MEA) yordamchi ligandlar sifatida ishlatilgan.

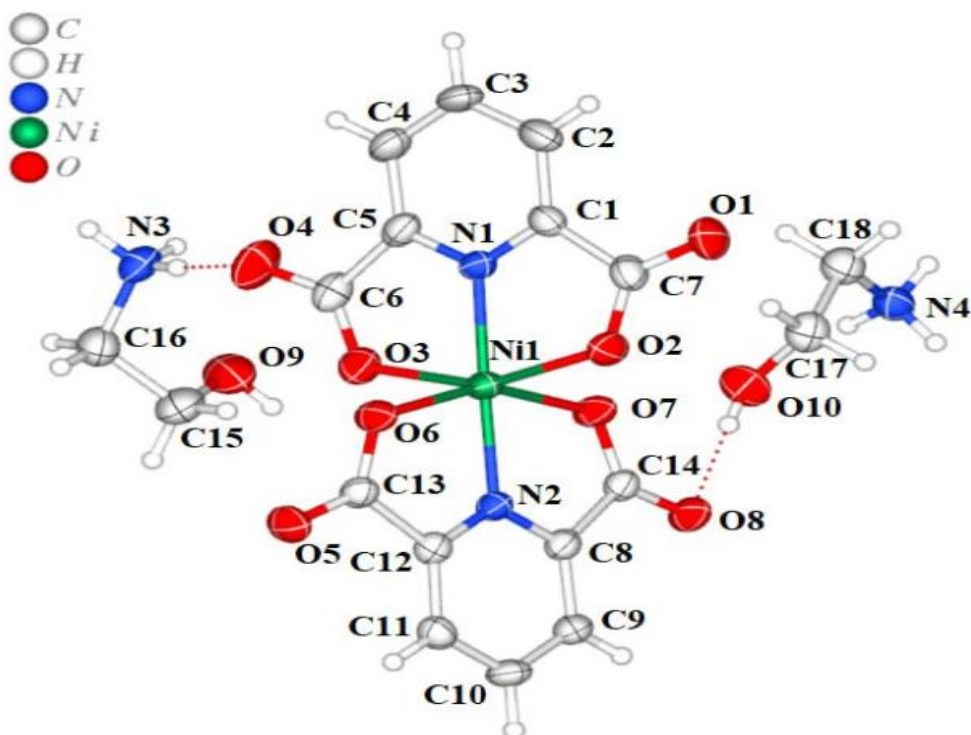
$[\text{Ni}(\text{dipic})_2](\text{mea})_2$ kompleksi sintezi. Nikel(II)atsetat kristallogidra tidan $\text{Ni}(\text{CH}_3\text{COO})_2 \cdot 7\text{H}_2\text{O}$ 0.1525 gr (0.5 mmol), 0.167 gr (1 mmol) 2,6 -PDCA ni tegishli suvda eritib, 1;2 mol nisbatdagi eritmalar tayyorlandi. Eritmalar aralashtirildi. Aralash ligandli kompleks birikma olish maqsadida monoetanolin (MEA) ning eritmasidan tomizildi. So'ngra magnitli aralashtirgich yordamida 60°C da 30 minut davomida intensiv aralashtirildi. Eritma xona haroratida qoldirildi. Natijada 10 kundan so'ng idish tubida och yashil rangli kompleks birikma monokristali o'sganligi kuzatildi. RTT analizi uchun yaroqli kristallar ajratilib, tekshirilganda $[\text{Ni}(\text{dipic})_2](\text{mea})_2$ tarkibli ekanligi aniqlandi. Unumi 86 % $[\text{Ni}(\text{dipic})_2](\text{mea})_2$ ($M_r=434.208\text{g/mol}$) $\text{C}_{16}\text{H}_{26}\text{N}_4\text{O}_{10}$ tahlili nazariy jihatdan: C 44.21, H 6.03, N 12.89, O 36.84 % ni ko'rsatdi: ma'lum bo'ldiki C 44.06, H 5.86, N 12.67, O 36.69 %. Reaksiya tenglamasi quyidagicha (1-sxema).



1-sxema. $[\text{Ni}(\text{dipic})_2](\text{mea})_2$ kompleks birikma sintezi.

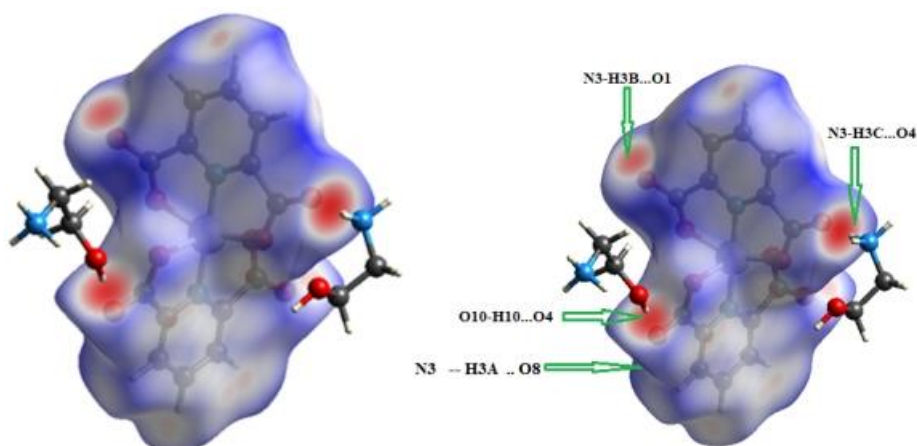
Tahlil natijalari.

Kompleksda ikkita azot va to'rtta kislorod atomi Ni atomlari bilan muvofiqlashtiriladi va hosil bo'lgan struktura bog'lanish uzunligi va bog'lanish burchagi qiymatlari asosida tasdiqlanadi. Ikki tridentat dipic ligandlarning har biri karboksilik guruhning ikkita kislorod atomi va dipic dianion ligandlarining piridin halqasining azot atomlari va monoetanolin kationlari (MEA) orqali koordinatalanadigan qarama-qarshi ionlardir. Kompleksda ikkita azot va to'rtta kislorod atomi Ni atomlari bilan muvofiqlashtiriladi va hosil bo'lgan struktura bog'lanish uzunligi va bog'lanish burchagi qiymatlari asosida tasdiqlanadi.



1-rasm. $[\text{Ni}(\text{dipic})_2](\text{mea})_2$ kompleksining molekulyar tuzilishi

Ikki tridentat dipik ligandlarning har biri karboksilik guruhning ikkita kislorod atomi va dipik dianion ligandlarining piridil halqasining azot atomlari va monoetanolamin kationlari (MEA) orqali koordinatsiyalanadigan qarama-qarshi ionlardir. Oxir-oqibat, mualliflar tomonidan buzilgan oktaedral kompleks struktura taklif qilindi. $[\text{Ni}(\text{dipic})_2]^{2-}$ divalent anion $2[\text{NH}_3\text{CH}_2\text{CH}_2\text{OH}]^+$ ikki valentli kation bilan muvozanatlangan zaryaddir. Har bir dipiv ligandning karboksilik guruhining O atomi bilan vodorod aloqalari orqali bog'langan muvofiqlashtirilmagan ikkita monoetanolamin (MEA) molekulalari. 1-rasmda ko'rsatilganidek, Ni(II) atrofida koordinatsiya geometriyasi buzilgan oktaedr bo'lib, har bir ikki valentli anion dipik ligand ekvatorial o'rinlarni ikkita kislorod atomi ($\text{Ni}(1)-\text{O}(3) = 2,133(3) \text{ \AA}$) va ($\text{Ni}(1)-\text{O}(3) = 2,133(3) \text{ \AA}$) va ($\text{Ni}(1) \text{ (Ni}(2) \text{ \AA}^2) \text{ (Ni}(2) = 1)$) egallaydi. Boshqa ekvatorial pozitsiyalarni boshqa dipic liganddan ikkita kislorod atomi ($\text{Ni}(1)-\text{O}(7) = 2,136(3) \text{ \AA}$) va ($\text{Ni}(1)-\text{O}(6) = 2,149(2) \text{ \AA}$) egallaydi.



2-rasm. $[\text{Ni}(\text{dipic})_2](\text{mea})_2$ ning uch o'ldamli Hirshfeld sirtining dnorm bo'yicha xaritasi ko'rinishi.

de va di funksiyalari yordamida olingan ikki o'ldamli barmoq izining grafiklari ko'rsatilgan bo'lib, $[\text{Ni}(\text{dipic})_2](\text{mea})_2$ kompleksining Hirshfeld yuzalarida kristall o'rash hosil bo'lishiga individual o'zaro ta'sirlarning hisssasi ko'rsatilgan. Shunday qilib, Hirshfeld yuzasini tahlil qilish natijasida quyidagi o'zaro ta'sirlar aniqlandi: O... H/H... O (50,9%), H... H (18,7%), H... C/C... H (10,9%), C... C (9,1%), O... C/C... O (5,8%), H... N/N... H (2,6%), N... N/N... H (2,6%), N... C/C, N... C/C. O..Yo'q/Yo'q..O 0,4%. Chuqur qizil dog'lar qo'shni turlar bilan kuchli yaqin o'zaro ta'sirni ko'rsatadi. Kompleks birikmaning molekulasi uchun uchastkaning o'rtasida qisqa va tor tikanlar bo'lgan keng hudud umumiy Xirshfeld sirtlarining O-H/H-O o'zaro ta'siri sifatida aks ettiriladi va bu kompleks-1 uchun hisoblangan eng yuqori foizdir va bu dipik lagandning metall kompleksi bilan solishtirish mumkin. Ni (II) kompleksining dnormasi uchun Hirshfeld yuzasi xaritasi (2-rasm) ko'rinib turibdiki, o'tkir qizil rang monoetanolamin (MEA) ning vodorod aloqasi va dipic ligandning karboksilik guruhining kislorodli aloqasi o'rtasida molekulalararo vodorod bog'lanish kuzatilganligini ko'rsatadi.

Xulosa: Tadqiqotlar natijasida 2,6-piridindikarbon kislotasining Nikel(II) atsetat va MEA bilan M:L:L 1:2:2 nisbatdagi kompleks birikmasi sintez qilindi. Sintez qilingan kompleksning tarkibi va tuzilishi RTT yordamida aniqlandi. Kompleks birikmaning kristallografik ma'lumotlari Kembridj kristallografik ma'lumotlar bazasiga (Cambridge Crystallographic Data Center) ga kiritildi (CCDC 2256725).<https://www.ccdc.cam.ac.uk/structures/Search?Ccdc=2403742&Author=nazarov&Access=referee>. Kompleksning molekulalararo o'zaro ta'sirlari xarakterini tavsiflash uchun Hirshfeld sirti tahlili o'tkazildi. Ushbu tahlil natijasiga ko'ra o'zaro ta'sirlarning asosiy qismini O... H/H... O (50,9%), H... H (18,7%) tashkil qildi.

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STEP-BY-STEP INTRODUCTION OF ISLAMIC BANKING PRODUCTS AND THE “ISLAMIC WINDOW” MODEL

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Annotation: this article examines the institutional, prudential, operational, and market prerequisites for the phased introduction of Islamic banking products and the Islamic window model within dual financial systems. The study systematizes contemporary international experience, evaluates the compatibility of Shariah-compliant instruments with existing banking infrastructures, and proposes a sequenced implementation framework that balances financial inclusion, regulatory proportionality, consumer protection, and systemic stability. The paper argues that a carefully staged Islamic window approach can serve as a lower-friction transition mechanism for emerging markets, particularly Uzbekistan, by enabling demand testing, governance standardization, and gradual ecosystem formation before full-fledged Islamic banking expansion.

Keywords: Islamic banking; Islamic window; Shariah governance; Murabaha; Ijarah; Mudarabah; Musharakah; regulatory sandbox; dual banking system; financial inclusion; prudential supervision

Introduction

Across many emerging economies, Islamic finance is increasingly viewed as a strategic complement to conventional intermediation rather than a parallel niche structure. The expansion of Shariah-compliant finance is associated not only with religious preference satisfaction, but also with market diversification and funding innovation. Industry evidence shows that Islamic finance has continued expanding in asset size, geographic spread, and product sophistication during recent years [1]. In 2024, global Islamic finance assets approached six trillion US dollars, confirming the sector's movement from peripheral relevance toward mainstream financial architecture. This trajectory has encouraged regulators to consider pragmatic entry routes that avoid abrupt institutional disruptions while preserving prudential discipline. Within such a context, the Islamic window model has emerged as a particularly important transitional mechanism for jurisdictions that currently operate predominantly conventional banking systems.

Unlike full-fledged Islamic banks, Islamic windows allow conventional institutions to provide ring-fenced Shariah-compliant products under controlled governance arrangements. That model is especially attractive where market demand is visible, yet institutional capacity, legal infrastructure, and supervisory experience remain incomplete. Comparative evidence from jurisdictions with mature regulatory systems demonstrates that windows can support product experimentation, operational learning, and customer education before deeper structural transformation [7]. From a policy perspective, the window approach also reduces entry costs because it reuses existing branch networks, digital channels, and customer acquisition systems. Such efficiency is highly relevant for economies seeking broader financial inclusion without duplicating costly distribution infrastructure. Therefore, the academic and practical significance of step-by-step Islamic window introduction lies in its ability to combine innovation, prudence, and institutional realism.

Uzbekistan presents a particularly meaningful case for discussing phased Islamic finance introduction because demand-side interest has long exceeded supply-side availability. The country's broader financial reforms, private sector development agenda, and search for diversified long-term funding sources create a favorable background for measured Shariah-compliant expansion. Official and analytical materials published during 2024–2025 indicate that the domestic market is beginning to form legal and operational foundations for Islamic finance development [8]. At the same time, international assessments suggest that Islamic banking assets in Uzbekistan could reach approximately USD 2.4 billion by 2033 under favorable institutional conditions [10]. These projections make the discussion of sequencing especially important, because premature liberalization may create governance inconsistencies, while excessive delay may suppress latent demand. For that reason, this article focuses on how Islamic banking products and the Islamic window model can be introduced gradually, coherently, and safely.

Main Part

Any serious discussion of Islamic banking introduction should begin with the conceptual distinction between conventional debt intermediation and asset-linked Shariah-compliant finance. Islamic banking prohibits *riba*, *gharar* in excessive forms, and transactions connected with impermissible sectors, thereby altering both product architecture and revenue logic. Instead of charging predetermined interest on cash loans, Islamic structures normally rely on trade, lease, partnership, and agency-based contractual relationships. *Murabaha*, *Ijarah*, *Salam*, *Istisna'*, *Mudarabah*, and *Musharakah* therefore represent functional financing tools rather than merely symbolic

legal labels [12]. This distinction matters for policymakers because regulatory treatment cannot simply imitate conventional product classification without considering substance, risk transfer, and documentation requirements. Consequently, phased implementation must start from clear product taxonomy and consistent legal interpretation rather than from promotional rhetoric alone.

From the regulator's standpoint, the Islamic window model is valuable because it enables incremental market entry under supervisory containment. A window is not merely a marketing division, but an operationally segregated Shariah-compliant business line embedded within a conventional institution. International supervisory literature has emphasized that Islamic finance requires legal clarity, governance quality, and risk-sensitive oversight equivalent in seriousness to conventional banking [4]. In practice, this means funds segregation, independent Shariah review, transparent product approval procedures, and distinct accounting treatment where relevant. Without such safeguards, institutions may face commingling risks, reputational damage, customer disputes, and weak enforceability of contractual arrangements. Hence, the success of Islamic windows depends less on branding and more on the discipline of internal architecture.

Sequencing is crucial because Islamic finance ecosystems do not emerge simultaneously across law, accounting, taxation, technology, liquidity management, and human capital domains. A phased strategy allows policymakers to prioritize lower-complexity products first, then widen the product set as institutional confidence increases. In most emerging markets, retail-friendly trade and lease products are typically introduced earlier than sophisticated partnership or capital market structures. That order is rational because Murabaha and Ijarah are easier to standardize, document, audit, and explain to both clients and supervisors [2]. Early success with simpler instruments helps establish data histories, consumer trust, process maps, and staff competence. Once these foundations mature, the system can move toward investment accounts, treasury instruments, and eventually sukuk-linked liquidity solutions.

Comparative policy experience strongly supports the argument that the Islamic window path works best when backed by a dedicated regulatory framework. Bank Negara Malaysia's Islamic Banking Window Policy Document, issued in November 2024, is particularly significant because it sets approval, governance, prudential, and operational requirements in a coherent format [7]. This document demonstrates that windows should not be regulated through scattered interpretive notes alone, especially where institutions need clarity on control functions and reporting obligations. Well-designed frameworks define eligibility criteria, board responsibilities, Shariah

governance structures, capital treatment logic, disclosure expectations, and recovery planning interfaces. They also reduce supervisory ambiguity by distinguishing window-specific obligations from bank-wide governance obligations. For Uzbekistan and similar jurisdictions, that lesson suggests that legal certainty should precede large-scale product rollout.

The prudential dimension deserves separate attention because Islamic windows create layered risk profiles inside hybrid institutions. Credit risk remains relevant, but it appears through trade receivables, lease rentals, counterparty obligations, and asset performance rather than through interest-bearing loans. In addition, Islamic finance introduces displaced commercial risk, Shariah non-compliance risk, equity investment risk, and fiduciary tensions linked to profit-sharing structures [5]. Supervisors therefore need a methodology that captures both familiar banking risks and contract-specific Islamic finance exposures. If prudential rules remain overly generic, institutions may underestimate provisioning needs, profit equalization decisions, and operational vulnerabilities. A sequenced rollout should accordingly align product introduction with the supervisory capacity to identify, measure, monitor, and mitigate these differentiated risks.

Shariah governance forms the intellectual and ethical backbone of an Islamic window and cannot be treated as a ceremonial appendage. An institution may have attractive products, strong digital channels, and sizable demand, yet still fail if governance bodies lack authority, competence, or independence. Revised IFSB corporate governance guidance stresses the need for robust governance structures and processes for institutions offering Islamic financial services [6]. In operational terms, this requires clearly defined mandates for Shariah boards or advisors, internal Shariah compliance units, internal audit coordination, and escalation procedures for breaches. The board of directors must also understand that Shariah compliance is inseparable from conduct risk, consumer trust, and franchise value. For this reason, phased implementation should begin with governance readiness assessments before any aggressive product launch.

Another strategic issue concerns the choice of first-wave products, because not all Islamic contracts are equally suitable for initial market entry. Retail Murabaha for household durables and SME equipment, together with Ijarah-based vehicle or machinery financing, usually provide the most manageable starting point. These contracts are comparatively easier to standardize, digitally process, and explain to customers accustomed to installment-based financial behavior. Official reporting from Uzbekistan indicates that microfinance institutions were permitted in 2024 to offer

Islamic finance services, including Murabaha, Ijarah, Salam, Musharakah, and Mudarabah mechanisms [8]. During August–December 2024, the reported volume of such financing reached about UZS 1.1 billion, offering an early domestic signal of operational feasibility. Although small in scale, that experience is analytically important because it provides a local prototype for phased Shariah-compliant deployment.

Demand estimation should not rely on anecdotal assumptions, because Islamic finance uptake depends on trust, affordability, digital convenience, and legal enforceability in addition to religious preference. A structured market assessment should segment customers by retail, microenterprise, SME, corporate, agricultural, and diaspora-linked financing needs. It should also differentiate between clients who prefer fully Shariah-compliant banking relationships and those who are open to selected products only. In this regard, an Islamic window offers a practical advantage because it can test actual demand using existing customer channels and transaction data. Product pilots reveal whether consumers value transparent asset-backing, fixed margin clarity, partnership sharing, or simply alternative branding. Such evidence-based sequencing prevents the costly mistake of overbuilding institutional capacity before validated market demand materializes.

Tax neutrality is often underestimated, yet it is one of the decisive conditions for viable Islamic window expansion. Because Islamic finance may involve multiple sale, transfer, lease, or agency steps, poorly aligned tax regimes can unintentionally create double taxation or timing mismatches. If Murabaha transactions trigger additional VAT exposure, registration costs, or legal transfer expenses compared with conventional lending, product competitiveness weakens immediately. Likewise, lease-based and commodity-linked structures may suffer if tax law ignores the economic equivalence of Shariah-compliant financing arrangements. Therefore, phased introduction should include a tax diagnostics exercise covering VAT, profit taxation, stamp duties, and asset transfer obligations. A credible Islamic window framework is not only a banking reform project, but also an interagency harmonization exercise.

Legal enforceability must develop in parallel with product rollout, otherwise front-end product design will exceed back-end dispute resolution capacity. Islamic contracts depend on precise drafting around ownership transfer, possession, agency, purchase undertakings, late payment treatment, and event-of-default mechanisms. Judges, arbitrators, notaries, external counsel, and compliance officers therefore require a shared understanding of how contractual form relates to economic substance. When that ecosystem is underdeveloped, even technically sound products may generate

litigation uncertainty and reputational damage. For this reason, model documentation and standardized clauses should be prepared before scale-up, particularly for Murabaha, Ijarah, and Wakalah-linked structures. Phased implementation should thus proceed from legal standardization toward market expansion, not the other way around. Technology architecture is equally central because Islamic windows are easier to supervise and scale when product logic is embedded into core systems rather than managed manually. Conventional banking software often assumes interest accrual mechanics, loan schedules, and penalty structures that do not fit Islamic contracts without customization. Digital transformation therefore becomes a governance issue, not just an efficiency initiative. Systems must support contract tagging, asset traceability, Shariah screening, profit allocation, customer disclosure, and exception management. In a phased plan, institutions should first digitize simpler products and create auditable data layers before launching complex profit-sharing structures. Such system readiness reduces operational risk, improves reporting quality, and strengthens the evidentiary basis for internal and external Shariah audits.

Funding and liquidity management represent one of the most difficult constraints for Islamic windows operating inside predominantly conventional markets. A bank may successfully originate Shariah-compliant assets, yet still struggle to manage short-term liquidity if no suitable interbank and high-quality liquid instruments exist. International regulatory discussions have long recognized that Islamic finance requires prudential infrastructure adapted to its contractual specificities rather than mechanical transplantation from conventional systems [5]. In the absence of domestic sukuk, commodity murabaha facilities, or Shariah-compliant money market instruments, window growth can become balance-sheet constrained. That problem is especially serious when deposit mobilization outpaces deployable Islamic assets, or when treasury placement options remain limited. Accordingly, the phased model should coordinate product rollout with central bank and market infrastructure reforms addressing liquidity management tools.

Human capital formation often becomes the hidden bottleneck that slows otherwise promising Islamic finance initiatives. Product manuals can be translated quickly, but genuine competence in Shariah governance, documentation, accounting, risk management, and customer communication takes sustained investment. Staff training should extend beyond relationship managers and include legal teams, internal auditors, compliance units, treasury officers, tax specialists, and IT architects. Moreover, training should distinguish between product knowledge and suitability assessment, because mis-selling can damage trust more rapidly than operational delays.

Universities, banking academies, regulators, and professional associations therefore need a coordinated certification ecosystem. Without that ecosystem, Islamic windows may expand numerically while remaining fragile substantively.

Consumer protection has unusual importance in Islamic window environments because customers are especially sensitive to authenticity and transparency concerns. If clients suspect that Islamic products merely mimic conventional interest under new terminology, reputational damage can spread quickly across the broader financial system. Disclosure standards should therefore explain transaction structure, ownership sequence, pricing basis, fees, rights, obligations, and Shariah approval status in accessible language [3]. Complaint resolution mechanisms should also be specialized enough to address disputes involving both banking service quality and Shariah compliance expectations. From a sequencing perspective, strong disclosure should appear in the first phase, not after products have already entered mass retail channels. Trust is a scarce asset in new Islamic finance markets, and early disclosure failures are disproportionately costly.

The relationship between Islamic windows and financial inclusion deserves deeper emphasis because inclusion benefits do not arise automatically from product introduction. Islamic windows can broaden participation among individuals and businesses that previously avoided formal finance due to religious considerations or mistrust of conventional products. However, inclusion will remain shallow unless products are priced competitively, documentation is simplified, and digital onboarding is made efficient. This is why the window model may outperform the immediate creation of new stand-alone institutions in early-stage markets. Existing banks already possess branch infrastructure, payment rails, customer data, and digital ecosystems that can reduce distribution costs. When used responsibly, that installed capacity can translate Islamic finance from symbolic availability into practical accessibility.

A phased Islamic window model also creates macroeconomic advantages if it supports SME formalization, trade finance diversification, and broader capital mobilization. Asset-backed and partnership-oriented products can align well with commerce, leasing, agribusiness, equipment financing, and value-chain transactions common in developing economies. Analytical projections for Central Asia indicate meaningful room for future Islamic banking and sukuk expansion, with Uzbekistan expected among the region's leading markets under favorable assumptions [11]. Such forecasts should not be interpreted mechanically, yet they indicate that delayed institutional preparation may carry opportunity costs. Investor appetite, diaspora interest, and development-finance partnerships generally favor jurisdictions that prepare early and

regulate coherently. Therefore, gradualism should not become passivity; it should be a disciplined route toward credible scale.

International standardization remains essential because domestic Islamic windows benefit from alignment with globally recognized governance and accounting practices. AAOIFI standards and related industry guidance help reduce interpretation gaps across contracts, documentation, and financial reporting expectations [12]. Their importance lies not in rigid uniformity, but in providing a credible benchmark for product design, auditability, and market confidence. When regulators and banks selectively align with recognized standards, they lower the cost of future cross-border partnerships and investor engagement. Standardization also protects local markets from ad hoc improvisation that may later require costly remediation. For that reason, any phased implementation roadmap should specify which global standards are mandatory, which are persuasive, and which require local adaptation.

The Uzbekistan case is especially instructive because the market appears to be moving from conceptual discussion toward measured operational experimentation. Official reporting confirms that Islamic finance services have already entered the microfinance segment under a defined regulatory basis, even if volumes remain modest [8]. This matters because many banking reforms fail by attempting large-scale launch without prior domestic operational learning. The existence of an early micro-level pilot creates an empirical foundation for later banking-sector expansion through carefully controlled Islamic windows. It enables regulators to observe customer behavior, documentation frictions, system limitations, and staff training needs in real conditions. Such learning-by-doing should become an explicit design principle of the national sequencing strategy.

A workable rollout architecture can be divided into several cumulative phases, each with different regulatory and institutional priorities. Phase one should focus on legal definitions, tax diagnostics, governance templates, and product standardization for a narrow retail-oriented portfolio. Phase two should authorize selected Islamic windows under strict eligibility criteria, limited product menus, ring-fencing rules, and enhanced disclosure obligations. Phase three may extend the product range toward SME, agricultural, and trade finance solutions once supervisory data and operational competence improve. Phase four should deepen market infrastructure through liquidity tools, sukuk development, Shariah-compliant treasury management, and specialized dispute resolution arrangements. Finally, phase five can evaluate whether selected windows are mature enough for conversion, subsidiarization, or coexistence with full-fledged Islamic banks.

It is equally important to define measurable indicators for each phase, because implementation quality cannot be inferred from the mere number of opened windows. Relevant indicators include complaint ratios, product turnaround times, training completion rates, Shariah audit findings, operational loss events, portfolio performance, and customer retention metrics. Prudential authorities should also track concentration by product type, funding source, maturity profile, and sectoral exposure to avoid hidden fragilities. Governance indicators are particularly important, including the timeliness of Shariah reviews, remediation closure rates, and board-level oversight quality. A phased framework without metrics quickly degenerates into symbolic reform and inconsistent supervisory practice. Effective sequencing therefore requires a dashboard-based approach integrating legal, market, governance, and risk indicators. One should also recognize the limits of the Islamic window model, because it is not a universally sufficient long-term solution. In some markets, windows may remain transitional and never evolve into deeper institutional ecosystems if treasury tools, talent pipelines, and legal frameworks stagnate. In other cases, strong demand may eventually justify separate balance sheets, dedicated subsidiaries, or full-fledged Islamic banks with clearer identity and governance. Yet these limits do not weaken the case for windows in early-stage environments; rather, they clarify the conditions under which windows remain useful. The question is not whether windows are perfect, but whether they are proportionate to current institutional readiness. For Uzbekistan and similar systems, the answer is often affirmative if sequencing is carefully governed. Ultimately, the phased introduction of Islamic banking products through an Islamic window framework should be viewed as a state-building exercise in financial governance. It requires cooperation among central banks, ministries of finance, tax authorities, judiciary institutions, higher education providers, standard-setting bodies, and private banks. Forecasts indicating future Islamic finance expansion in Uzbekistan and Central Asia reinforce the strategic value of acting early, but they also underscore the necessity of disciplined preparation [10]. A robust framework must combine legal clarity, Shariah governance, tax neutrality, digital readiness, consumer protection, and liquidity infrastructure into a coherent institutional sequence. When these elements are synchronized, Islamic windows can move from experimental offering toward trusted national financial architecture. When they are fragmented, the same model may produce reputational controversy, shallow adoption, and regulatory stress.

Table 1.

**Proposed phased roadmap for introducing Islamic banking products and the
Islamic window model**

Phase	Main objective	Core instruments / actions	Key institutional output
Phase 1	Establish legal and conceptual basis	Definitions, taxonomy, licensing concepts, tax review	Foundational legal clarity
Phase 1	Build governance architecture	Shariah governance rules, board mandates, internal controls	Governance readiness
Phase 1	Standardize initial products	Murabaha, Ijarah, basic deposit/investment structures	Standard product documentation
Phase 2	Pilot limited Islamic windows	Restricted licenses in selected banks	Controlled market entry
Phase 2	Strengthen systems and reporting	Core banking adjustments, ring-fencing, reporting templates	Operational traceability
Phase 2	Launch consumer protection tools	Disclosure forms, complaint handling, suitability protocols	Trust and transparency
Phase 3	Expand target segments	SME, agriculture, trade finance, micro and retail scale-up	Broader inclusion impact
Phase 4	Develop market infrastructure	Liquidity tools, interbank solutions, sukuk groundwork	Prudential sustainability
Phase 5	Evaluate structural deepening	Conversion, subsidiarization, or coexistence models	Long-term sector architecture

Source: Developed by the author based on IMF, IFSB, BNM, CBU, and international Islamic finance industry materials, 2021–2025.

Conclusion

The analysis demonstrates that the Islamic window model is not merely a temporary commercial arrangement, but a structured institutional bridge between conventional banking dominance and Shariah-compliant financial diversification. Its central advantage lies in allowing regulators and banks to test real demand, develop governance capability, and accumulate operational evidence without imposing abrupt systemic transformation. The study also shows that successful implementation depends on several mutually reinforcing conditions, including legal clarity, tax neutrality, product standardization, digital traceability, and independent Shariah governance. Where those conditions are absent, Islamic windows risk becoming superficial branding mechanisms rather than credible financial innovations. Conversely, where sequencing is coherent, windows can expand inclusion, attract new capital, and build market legitimacy for later structural deepening. For emerging financial systems,

especially Uzbekistan, the phased model offers a realistic and policy-efficient route toward sustainable Islamic finance development.

The main findings of the article may be summarized in four final conclusions. First, the most appropriate entry strategy for early-stage jurisdictions is a phased rollout beginning with lower-complexity products such as Murabaha and Ijarah. Second, governance quality is the decisive determinant of long-run credibility, meaning Shariah compliance mechanisms must be integrated into board oversight, audit, disclosure, and remediation systems. Third, prudential sustainability requires Islamic window expansion to proceed simultaneously with tax reform, legal standardization, technology adaptation, and liquidity management infrastructure. Fourth, domestic pilot experience and international standard alignment together create the strongest basis for gradual scaling, whether toward larger windows, dedicated subsidiaries, or eventually full-fledged Islamic banks. Therefore, the path to effective Islamic finance expansion lies neither in haste nor in hesitation, but in disciplined institutional sequencing. Such sequencing converts latent demand into sustainable intermediation capacity while preserving trust, stability, and supervisory coherence.

Proposals

Proposal 1. Uzbekistan should adopt a **two-tier licensing design** for Islamic windows, where the first tier permits only standardized retail Murabaha and Ijarah products, while the second tier is granted only after verified compliance performance, system segregation, and Shariah audit maturity.

Proposal 2. A **national Shariah governance template pack** should be issued for all pilot institutions, including model board charters, product approval workflows, breach escalation matrices, disclosure forms, and internal audit checklists, so that implementation quality does not depend on fragmented institutional improvisation.

Proposal 3. The Central Bank, Ministry of Finance, tax authorities, and judicial training institutions should create a **joint Islamic finance implementation lab**, where legal clauses, tax treatment scenarios, accounting entries, and dispute patterns are stress-tested before large-scale market rollout.

Proposal 4. Pilot banks should be required to build a **digital traceability module** inside their core systems that tags every Islamic contract by product type, asset flow, approval path, and Shariah review status, thereby enabling real-time supervisory analytics and stronger customer trust.

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**ADVANCED EXPERIENCE OF DEVELOPED FOREIGN COUNTRIES IN
THE EFFECTIVE USE OF UNMANNED AERIAL VEHICLES IN
NATIONAL GUARD UNITS TO ELIMINATE MASS RIOTS AND
PROSPECTS FOR THEIR USE IN OUR COUNTRY**

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Abstract: in recent years, many countries have begun to deploy unmanned aerial vehicles (UAVs) - drones - in crowd-control operations. This article examines the current use of UAVs by the National Guard of Uzbekistan to manage disturbances, reviews the experiences of France, Turkey, the United States, Israel, Spain and other states, and outlines prospects for future deployment. The authors discuss five main functions of drones in public-order missions: psychological influence (loudspeakers, banners and colour signals), leaflet distribution, surveillance and intelligence, delivery of urgent medical supplies and transport of necessary weapons and ammunition. Based on official statistics from 2021-2025, a simple regression model evaluates the effectiveness of UAV deployment and its impact on crime trends.

Keywords: mass disturbances, National Guard, unmanned aerial vehicles, drone technologies, public safety, psychological influence, aerial surveillance, operational command center, leaflet distribution, medical supply delivery, regression analysis, foreign experience.

The early decades of the twenty-first century have seen a rise in mass protests, street demonstrations and other forms of social confrontation around the world. In parallel, law-enforcement agencies and specialised units have begun to adopt innovative technologies - notably unmanned aerial vehicles - to maintain public safety. Although drones were initially designed for reconnaissance and military operations, their light weight, high manoeuvrability and ability to carry diverse payloads (cameras, loudspeakers, gas canisters, medical kits) make them well suited to peace-time security missions.

In Uzbekistan the National Guard is responsible for safeguarding public order and citizens' safety under the Constitution and other legal acts. Yet crime has risen

significantly since 2020: according to Gazeta.uz, 132,298 crimes were recorded in 2024 - 27.1 % more than in 2023 and more than double the 2020 figure[1]. Some 20.2 % of offences were against public safety and order[2], underscoring the need for rapid and effective counter-measures. In this context, using drones for monitoring and prevention appears promising for Uzbekistan as well.

The activities of the National Guard are regulated by the Constitution of Uzbekistan, the Defence Doctrine (9 January 2018), the regulation on military service (12 September 2019) and other normative acts. These documents lay down the principles of maintaining public order, proportional use of force, and the conditions for employing weapons and special means. As a technical tool, UAVs must conform to these principles. Under the Chemical Weapons Convention and the United Nations Code of Conduct for Law Enforcement Officials, riot control agents may only be used “in types and quantities that are consistent with the purposes” of law enforcement[3]. These international norms also apply if gas is dispersed via a drone platform.

This article combines qualitative and quantitative analysis. Foreign experience was studied through legal documents, monographs and academic articles. Official statistics on crime in Uzbekistan for 2021-2025 were compiled and regression analysis was conducted using the number of UAV missions (approximate) as the independent variable. A linear regression model was estimated with the help of the scikit-learn package; the independent variable was the number of UAV missions (0, 0, 100, 300, 500), and the dependent variable was the number of crimes against public safety (around 20-27 thousand per year). The results show an R^2 of about 0.01, a coefficient of -0.377 and an intercept of 26,272, indicating a weak but negative relationship between the increase in UAV missions and the decline in public-safety crimes (see detailed analysis below).

In crowd-control operations, psychological influence involves persuading or warning people through voice messages, banners and colour signals. UAV platforms can deliver these effects effectively. The drone-software company FlytBase notes that loudspeakers and sirens mounted on drones are convenient for giving public announcements, directing people to safety and dispersing unruly gatherings[4]. During the COVID-19 pandemic in Spain, police flew drones over gatherings and used onboard speakers to tell citizens to go home or maintain distance; officers later described drones as a fundamental element for monitoring public spaces and helping the police[5].

Based on this experience, the National Guard could develop the following algorithm:

- Equip drone platforms with high-powered loudspeakers or megaphones.

- When the aircraft approaches a disturbance, the control centre broadcasts a live message: “You are under observation; your actions are illegal. Please disperse!”
- Banners and coloured signals complement the voice: white for initial warnings, yellow to indicate the possibility of force being used and red to signal that special means may follow. Drones can carry LED strips or signal flags to display these colours.
- Ground patrols with megaphones synchronise their warnings while the airborne platform provides oversight from above.

Several countries distribute leaflets during disturbances to remind citizens of safety rules and collective responsibility. By using a downward-facing release mechanism or capsule, a drone can spread leaflets over broad areas, reducing manpower and the need for officers in dense crowds.

Many law-enforcement agencies primarily use drones for surveillance and situational awareness. Israel’s Cyclone system, for example, is built on a hexacopter and mounts twelve tear-gas grenades along with a high-definition camera and real-time communication[6]. Turkey’s **Songar** drone also has dual cameras and real-time video transmission, allowing operators to observe a scene remotely and make quick decisions[7].

Drawing on these experiences, the National Guard could deploy drones to:

- Monitor crowd size and density at markets, stadiums and public events.
- Detect traffic flows, road blocks or bottlenecks; livestream video to a command post.
- Identify armed individuals or provocations early during unrest and inform targeted units.

Humanitarian drones have been widely used during natural disasters. During disturbances, delivering first aid to injured citizens in hard-to-reach areas is equally important. Drones can transport basic medicines, tourniquets, defibrillators and other small medical instruments. In Spain, police drones equipped with thermographic cameras monitored body temperatures on beaches and helped deliver emergency assistance during the pandemic[5].

Some countries also use drones to transport special weapons and ammunition. In the United States, the *Shadowhawk* helicopter drone carries payloads of up to 22 pounds (about 10 kg) and can be equipped with 37 mm or 40 mm launchers for tear-gas grenades, used in law-enforcement missions[8]. Certain variants of Turkey’s *Songar* system have an eight-shot launcher for tear- or smoke grenades and are used to suppress riots[7]. Such tools should always be subject to strict legal control and proportionality;

if adopted in Uzbekistan, the legal basis must be defined clearly and in line with international norms.

At the Milipol 2015 exhibition French authorities displayed the **AS-150 Aero Surveillance** helicopter drone, which can carry a payload of 125 pounds (57 kg) and is designed to deploy tear-gas and smoke grenades[9]. The system offers a convenient airborne platform for police in riot-control operations. Its appearance sparked debate in Europe; humanitarian organisations warned that drone-dispersed gas could be dangerous and psychologically intimidating for communities under constant surveillance.

The Israeli defence industry has developed several armed drone systems; among them the **Cyclone** mounts twelve tear-gas grenade launchers on a hexacopter[6]. This allows security forces to combine precision strikes with real-time surveillance while using minimal personnel. Reports indicate that Israel has tested such technologies during demonstrations in Gaza and elsewhere.

In 2020 the Turkish armed forces introduced their own **Songar** drone systems. These platforms come in several variants, some with an eight-shot tear- or smoke-grenade launcher and others with small firearms[7]. The drones feature continuous flight, automatic targeting, identification of hostile points and real-time video links. Turkey has tested these technologies in both military operations and public-order contexts.

The **Shadowhawk** drone, developed by Vanguard Defense Industries, carries up to 22 pounds and can be equipped with 37 mm or 40 mm grenade launchers for tear-gas deployment[8]. Law-enforcement agencies in the United States have tested such drones, but arming UAVs remains controversial.

China's Tong Fei II drone is designed to drop gas bombs and smoke grenades during unrest; reports claim it can carry about ten canisters and operate within a 20-km radius[6]. Chinese police also make extensive use of drones with loudspeakers for warnings and surveillance.

In Latin America, countries such as Chile and Brazil use drones to secure public order. Brazilian police deploy drones to reconnoitre criminal areas before entering, monitor demonstrations and transport supplies during urgent operations.

From 2020 to 2021 police in several Spanish cities introduced drones as part of coronavirus measures. The drones broadcast reminders to stay at home and maintain social distance, and later used thermal-camera technology to count people on beaches and transmit data to officers[5]. Police representatives said drones became essential for controlling crowd density and supporting agents in public spaces[5].

At present, National Guard units mainly use drones in cooperation with regional armed forces for reconnaissance and border control. The deployment of UAVs in public-order missions remains limited. Several factors explain this situation:

1. **Insufficient legal framework.** There is no specific law regulating the use of weapons or special means via UAV. Existing acts such as the Defence Doctrine and the regulation on military service outline general principles but do not address drone operations.
2. **Limited technical infrastructure.** The National Guard possesses light surveillance drones whose payload capacity and camera quality are modest. There are no drones suited to carrying weapons or loudspeakers.
3. **Lack of trained operators and psychological preparation.** Effective use of drones requires operators skilled not only in technical piloting but also in communication with the public and basic medical knowledge. Such training is still limited.

Therefore it is important to study international experience and expand current capabilities.

Using data from the national statistics service and media reports (Gazeta.uz and Kun.uz), the number of recorded crimes in Uzbekistan was assessed as follows: 111,082 in 2021; roughly 116,000 in 2022; 104,000 in 2023; 132,298 in 2024; and an estimated 130,000 in 2025. The share of crimes against public safety and order fell from around 24 % (2021) to 20.2 % (2024)[\[2\]](#), resulting in about 26 thousand such offences per year.

Because no official statistics exist on UAV deployments, estimated figures were used: drones were assumed absent (0 missions) in 2021-2022; experimental use in 2023 (100 missions); increased to 300 missions in 2024 and to 500 in 2025. A linear regression model was estimated:

$$\hat{Y} = \beta_0 + \beta_1 X,$$

where Y denotes the number of public-safety crimes and X the number of UAV missions. The estimated coefficients (using scikit-learn) are $\beta_0 \approx 26,272.5$, $\beta_1 \approx -0.377$ and $R^2 \approx 0.012$. The negative slope suggests that greater drone use is associated with a slight decline in public-safety crimes, but the very low R^2 indicates a weak correlation based on only five years of data and without controlling for other factors.

Under this model, about 26,159 public-safety crimes are projected if 300 UAV missions are flown in 2024, and 26,084 crimes if 500 missions are flown in 2025[\[2\]](#).

Actual figures may differ markedly because crime levels are influenced by economic, demographic and health-related factors as well.

Prospects and recommendations for implementation

For the National Guard of Uzbekistan to adopt drones effectively, the following strategies should be considered:

1. **Improve the legal basis.** Enact regulations specifying the procedures for using special means via drones - e.g. launching gas cartridges or transporting ammunition - ensuring conformity with UN and CWC requirements and training personnel in the proportional use of force.
2. **Modernise the technical fleet.** Procure or locally develop medium-lift drones similar to those used in Turkey or France. These should support modular payloads (loudspeaker, LED signals, grenade launchers).
3. **Train operators and emphasise psychological approach.** Operators must master not only technical piloting but also ethical communication with the public. Training in psychology helps handle stress, de-escalate conflicts and respect citizens' rights.
4. **Integrate information systems.** Analyse video and sensor data from drones in a joint command centre, integrating with police, public-safety and medical services.
5. **Engage with the public and ensure transparency.** To prevent distrust, conduct information campaigns, cooperate with media and involve civil-society representatives in oversight.

CONCLUSION

Unmanned aerial vehicles can become an effective supplementary tool for maintaining public safety and managing mass disturbances. Experiences from France, Israel, Turkey, the United States, Spain and other countries demonstrate that drones can be used for voice announcements, reconnaissance, deployment of tear gas or smoke grenades, leaflet distribution and medical delivery. In Uzbekistan, rising crime rates and public-safety challenges make the introduction of such technologies increasingly necessary. Nevertheless, the legal framework, respect for human rights and the principle of proportionality must always be paramount.

The regression analysis revealed a weak negative relationship between the number of UAV missions and the number of public-safety crimes; more extensive data and additional variables are needed for a more robust assessment. Even so, combining drones for psychological influence, surveillance, logistics and medical support can enhance public safety and help prevent offences.

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THE ROLE OF K-POP CULTURE AS A MOTIVATOR IN THE ACADEMIC STUDY OF KOREAN PHILOLOGY

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Abstract

In recent decades, the rapid global expansion of Korean popular culture, commonly referred to as the Korean Wave or Hallyu, has significantly influenced cultural consumption patterns and educational interests around the world. Among the most influential components of the Korean Wave is K-pop music, which has gained remarkable popularity among young people across diverse cultural contexts. This article examines the role of K-pop culture as a motivating factor in the academic study of Korean philology. The study explores how exposure to Korean pop music, idol culture, and related media encourages learners to develop interest in the Korean language, literature, and cultural studies. Using theoretical analysis and comparative perspectives from language education research, the article analyzes the ways in which popular culture can function as a pedagogical tool that enhances language acquisition and intercultural competence. The research highlights that K-pop fandom communities, online platforms, and multimedia content contribute to increased motivation among students pursuing Korean philology programs in universities worldwide. Furthermore, the article discusses the potential benefits and challenges of integrating K-pop related materials into formal academic curricula. The findings indicate that while popular culture can serve as a powerful motivational mechanism, it should be used in a balanced manner alongside traditional philological methods to ensure the development of comprehensive linguistic and cultural competence. The study concludes that K-pop culture has become an influential gateway through which global youth engage with Korean language and philological studies, thereby contributing to the internationalization of Korean humanities education.

Keywords: K-pop culture, Korean philology, language motivation, Korean Wave, cultural influence, language learning.

Introduction

In the era of globalization and digital communication, cultural products circulate rapidly across national and linguistic boundaries. One of the most significant cultural phenomena of the twenty-first century is the global spread of Korean popular culture, widely known as the Korean Wave or Hallyu. The Korean Wave encompasses a wide range of cultural exports, including television dramas, films, fashion, cuisine, and particularly K-pop music. Over the past two decades, K-pop has evolved into a global cultural industry with millions of fans worldwide.

The international popularity of K-pop has created new opportunities for cross-cultural interaction and language learning. Many young people who initially encounter Korean culture through music and entertainment gradually develop an interest in learning the Korean language and studying Korean culture in greater depth. As a result, universities in numerous countries have reported an increase in enrollment in Korean language and Korean studies programs.

Korean philology, as an academic discipline, involves the systematic study of the Korean language, literature, and cultural heritage. Traditionally, philological studies focus on linguistic analysis, historical texts, literary criticism, and cultural interpretation. However, in the contemporary educational context, popular culture has become an important gateway through which students become interested in these academic fields.

K-pop culture, with its dynamic music, visually appealing performances, and global digital presence, plays a particularly influential role in shaping students' perceptions of Korean culture. For many learners, K-pop serves as the first point of contact with the Korean language. Lyrics, interviews, fan communities, and social media interactions expose audiences to authentic linguistic material and cultural expressions.

From a pedagogical perspective, motivation is one of the most critical factors in successful language acquisition. Scholars in the field of language education emphasize that learners who possess strong intrinsic motivation are more likely to achieve higher levels of proficiency and engagement. In this context, K-pop culture can function as a motivational catalyst that encourages learners to pursue formal academic studies in Korean philology.

Despite its popularity, the role of K-pop culture in academic education remains a topic of debate. Some scholars argue that popular culture may distract students from rigorous academic study, while others suggest that it can be effectively integrated into educational practices to enhance motivation and cultural understanding.

Therefore, the purpose of this article is to examine the role of K-pop culture as a motivational factor in the academic study of Korean philology. The research explores how exposure to K-pop influences students' interest in Korean language learning, how it contributes to cultural engagement, and how it can be integrated into academic curricula.

Main Body

The Global Spread of K-pop Culture

K-pop has become one of the most visible cultural exports of South Korea. Its global expansion is closely connected with the development of digital media platforms such as YouTube, social networking services, and online streaming services. These technologies have allowed Korean music companies to reach global audiences without relying solely on traditional distribution channels.

K-pop is characterized by a unique combination of musical styles, visually sophisticated performances, and highly organized entertainment industries. The training system for K-pop idols involves rigorous preparation in singing, dancing, and language skills. As a result, K-pop performances are often associated with high levels of professionalism and artistic production.

For international audiences, K-pop represents not only music but also a broader cultural experience. Fans often become interested in Korean fashion, language, cuisine, and traditions. This phenomenon demonstrates how cultural products can function as vehicles of cultural diplomacy and international cultural exchange.

K-pop as a Source of Language Learning Motivation

Motivation plays a fundamental role in language acquisition. In educational psychology, motivation is generally divided into intrinsic motivation and extrinsic motivation. Intrinsic motivation refers to the internal desire to learn a language for personal interest or enjoyment, while extrinsic motivation refers to external rewards or requirements.

K-pop culture often stimulates intrinsic motivation among learners of Korean. Many fans wish to understand song lyrics, interviews, and television programs without relying on translations. This desire encourages them to learn vocabulary, pronunciation, and grammar independently.

Furthermore, fan communities provide supportive environments for language practice. Online forums, fan translation projects, and social media discussions create opportunities for learners to interact with others who share similar interests. Such communities contribute to collaborative learning and intercultural communication.

Cultural Engagement and Intercultural Competence

The study of Korean philology involves not only linguistic knowledge but also cultural understanding. Language and culture are deeply interconnected, and effective language learning requires awareness of cultural contexts and social norms.

K-pop culture introduces learners to various aspects of Korean society, including contemporary youth culture, social values, and artistic expression. Through music videos, variety shows, and fan events, learners encounter cultural symbols, gestures, and communication styles that reflect Korean cultural identity.

This exposure contributes to the development of intercultural competence. Students who engage with K-pop culture often develop a deeper appreciation for cultural diversity and cross-cultural communication.

Educational Applications of K-pop in Korean Philology Programs

Some educators have begun to incorporate elements of K-pop culture into language instruction. For example, song lyrics can be used to teach vocabulary, grammar patterns, and pronunciation. Music videos can provide visual context for cultural analysis.

Using popular culture in the classroom can increase student engagement and create a more dynamic learning environment. When students feel emotionally connected to learning materials, they are more likely to participate actively in discussions and assignments.

However, educators must also ensure that academic rigor is maintained. K-pop materials should complement, rather than replace, traditional philological study, which includes literary analysis, historical linguistics, and classical texts.

Challenges and Limitations, Despite its motivational potential, the integration of K-pop culture into academic education presents several challenges. One concern is the possibility that students may focus primarily on entertainment aspects rather than serious academic study.

Another challenge relates to the representation of Korean culture. K-pop reflects only one segment of contemporary Korean society and may not fully represent the diversity of Korean cultural traditions.

Therefore, educators should adopt a balanced approach that combines popular cultural materials with broader cultural and historical perspectives.

Conclusion

The global popularity of K-pop culture has created new pathways for international engagement with Korean language and culture. For many students, K-pop serves as an initial motivation that leads them to pursue academic studies in Korean philology.

The findings of this study suggest that K-pop culture can play a significant role in stimulating language learning motivation and promoting intercultural understanding. Through exposure to music, media, and fan communities, learners become more interested in exploring Korean language, literature, and cultural heritage.

At the same time, the integration of popular culture into academic education requires careful consideration. While K-pop can enhance motivation and engagement, it should be used alongside traditional philological methods to ensure a comprehensive understanding of Korean language and culture.

In conclusion, K-pop culture represents not only a global entertainment phenomenon but also a powerful educational resource that can inspire students to pursue deeper academic exploration of Korean philology.

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INSON RESURLARINI BOSHQARISHNING ZAMONAVIY USULLARI VA ULARNING TASHKILOT SAMARADORLIGIGA TA'SIRI

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Annotatsiya: Maqolada inson resurslarini boshqarishning zamonaviy usullari, ularning tashkilot faoliyatidagi o'rni hamda korxona samaradorligini oshirishdagi ahamiyati ilmiy jihatdan tahlil qilingan. Inson resurslarini boshqarish tizimining asosiy yo'nalishlari, xodimlarni tanlash, baholash, rivojlantirish va rag'batlantirish mexanizmlari ko'rib chiqilgan. Shuningdek, zamonaviy HR texnologiyalarining qo'llanilishi, raqamli boshqaruv tizimlari hamda inson kapitalining iqtisodiy rivojlanishdagi roli yoritilgan.

Kalit so'zlar: inson resurslari, HR menejment, motivatsiya, boshqaruv, kadrlar siyosati, samaradorlik, tashkilot, mehnat resurslari, inson kapitali, raqamli HR.

Hozirgi globallashuv sharoitida tashkilotlar faoliyatining samaradorligi ko'p jihatdan inson resurslarini to'g'ri boshqarishga bog'liq. Zamonaviy iqtisodiyotda moddiy resurslarga nisbatan inson kapitalining ahamiyati ortib bormoqda. Har qanday korxona yoki tashkilotning muvaffaqiyati unda faoliyat yuritayotgan xodimlarning bilim darajasi, malakasi, tajribasi va motivatsiyasiga bog'liq. Shu sababli inson resurslarini boshqarish zamonaviy menejmentning eng muhim yo'nalishlaridan biri hisoblanadi.

Inson resurslarini boshqarish – bu tashkilotning maqsadlariga erishish uchun xodimlarni rejalashtirish, tanlash, joylashtirish, rivojlantirish va rag'batlantirish jarayonlarini o'z ichiga olgan boshqaruv faoliyatidir. Rivojlangan davlatlar tajribasi shuni ko'rsatadiki, samarali HR tizimi mavjud bo'lgan tashkilotlarda mehnat unumdorligi yuqori bo'ladi.

O'zbekiston Respublikasida ham so'nggi yillarda inson kapitalini rivojlantirishga alohida e'tibor qaratilmoqda. Yangi boshqaruv usullarini joriy etish, kadrlar tayyorlash tizimini takomillashtirish, zamonaviy HR texnologiyalarini qo'llash dolzarb vazifalardan biri hisoblanadi.

1. Inson resurslarini boshqarishning nazariy asoslari

Inson resurslarini boshqarish tushunchasi XX asrning ikkinchi yarmidan boshlab keng qo'llanila boshladi. Avvalgi davrlarda korxonalarda faqat kadrlar hisobini yuritish bilan cheklanilgan bo'lsa, hozirgi kunda xodimlar strategik resurs sifatida qaralmoqda.

Inson resurslarini boshqarish quyidagi asosiy tamoyillarga asoslanadi:

- xodimlarni tashkilotning eng muhim boyligi deb hisoblash
- har bir xodimning salohiyatidan samarali foydalanish
- mehnatni rag'batlantirish orqali natijadorlikni oshirish
- xodimlarni doimiy rivojlantirib borish
- jamoada ijobiy muhit yaratish

1-jadval¹

№	Inson resurslarini boshqarish tizimi strukturasi	
1	Kadrlarni rejalashtirish	Tashkilotda zarur bo'lgan xodimlar soni va ularning malakasini oldindan aniqlash jarayoni.
2	Xodimlarni tanlash	Bo'sh ish o'rinlariga mos nomzodlarni izlash va saralash.
3	Ishga qabul qilish	Tanlangan nomzodni belgilangan tartibda ishga rasmiylashtirish.
4	Moslashtirish (adaptatsiya)	Yangi xodimni jamoaga va ish sharoitiga moslashtirish jarayoni.
5	Malaka oshirish	Xodimlarning bilim va ko'nikmalarini rivojlantirish, qayta tayyorlash.
6	Baholash	Xodimlarning mehnat faoliyati natijalarini aniqlash va tahlil qilish.
7	Rag'batlantirish	Xodimlarni samarali ishlashga undash uchun moddiy va nomoddiy mukofotlar berish.
8	Mehnat munosabatlarini boshqarish	Xodimlar va ish beruvchi o'rtasidagi munosabatlarni tartibga solish.

Ushbu jarayonlarning to'g'ri tashkil etilishi korxona samaradorligini oshirishga xizmat qiladi.

2. Xodimlarni tanlash va joylashtirish tizimi

¹ Manba - Abdurahmonov Q.X. Personalni boshqarish. – Toshkent: Iqtisodiyot, 2021.

Tashkilot faoliyatida xodimlarni to'g'ri tanlash muhim ahamiyatga ega. Noto'g'ri tanlangan kadr korxona faoliyatiga salbiy ta'sir ko'rsatishi mumkin. Shu sababli zamonaviy HR tizimida tanlov jarayoni bir necha bosqichda amalga oshiriladi.

Xodimlarni tanlash jarayoni quyidagi bosqichlarni o'z ichiga oladi:

- bo'sh ish o'rnini aniqlash
- nomzodlarni qidirish
- suhbat o'tkazish
- test sinovlari
- malakasini baholash
- ishga qabul qilish

Zamonaviy tashkilotlarda quyidagi tanlash usullari qo'llaniladi:

- kompetensiya asosida tanlash
- psixologik testlar
- intervyu
- amaliy topshiriqlar
- sinov muddati

To'g'ri tanlangan xodim tashkilot rivojlanishiga katta hissa qo'shadi.

3. Xodimlarni motivatsiya qilish va rag'batlantirish

Motivatsiya inson resurslarini boshqarishning eng muhim elementlaridan biri hisoblanadi. Tashkilot faoliyatining samaradorligi ko'p jihatdan xodimlarning o'z ishiga bo'lgan munosabati, qiziqishi va mas'uliyatiga bog'liq. Shu sababli zamonaviy boshqaruv tizimida xodimlarni rag'batlantirish va ularning mehnat faoliyatini qo'llab-quvvatlash muhim vazifa hisoblanadi. Motivatsiya orqali xodimlarning mehnat unumdorligini oshirish, tashkilot maqsadlariga erishish hamda jamoada sog'lom muhit yaratish mumkin.

Motivatsiya odatda ikki turga bo'linadi:

1. Moddiy motivatsiya
2. Nomoddiy motivatsiya

Moddiy motivatsiya

Moddiy motivatsiya xodimlarni pul yoki moddiy rag'batlar orqali ishlashga undashni anglatadi. Bu motivatsiya turi eng keng tarqalgan bo'lib, xodimlarning asosiy ehtiyojlarini qondirishga xizmat qiladi. Moddiy rag'batlantirish tizimi to'g'ri tashkil etilgan bo'lsa, xodimlarning ishga bo'lgan qiziqishi ortadi va ular yuqori natijalarga erishishga intiladi.

Moddiy motivatsiya quyidagi shakllarda bo‘ladi:

- ish haqi — xodimning bajargan mehnati uchun beriladigan asosiy to‘lov hisoblanadi. Ish haqi adolatli va mehnat hajmiga mos bo‘lishi kerak.
- mukofot — yaxshi natija ko‘rsatgan xodimlarni qo‘shimcha rag‘batlantirish uchun beriladi.
- bonus — belgilangan reja yoki ko‘rsatkichlar bajarilganda to‘lanadigan qo‘shimcha pul mablag‘i.
- qo‘shimcha to‘lovlar — ustama, kompensatsiya, moddiy yordam, xizmat safarlari uchun to‘lovlar va boshqa rag‘batlantirish shakllari.

Moddiy motivatsiya xodimlarning moddiy ehtiyojlarini qondiradi, lekin faqat moddiy rag‘batning o‘zi yuqori samaradorlikni doimo ta‘minlay olmaydi. Shu sababli zamonaviy boshqaruvda nomoddiy motivatsiya ham muhim hisoblanadi.

Nomoddiy motivatsiya

Nomoddiy motivatsiya xodimlarni puldan tashqari usullar bilan rag‘batlantirishni anglatadi. Bu motivatsiya turi xodimning ruhiy holatiga, jamoadagi o‘rniga va o‘zini qadrlangan his qilishiga ta‘sir qiladi. Tadqiqotlar shuni ko‘rsatadiki, ko‘plab hollarda nomoddiy rag‘batlantirish moddiy rag‘batdan ham kuchliroq ta‘sir ko‘rsatishi mumkin. Nomoddiy motivatsiya quyidagi shakllarda amalga oshiriladi:

- maqtoov — xodimning yaxshi ishlaganini e‘tirof etish, rahbariyat tomonidan minnatdorchilik bildirish.
- lavozim oshirish — xodimning xizmat darajasini ko‘tarish orqali uni rag‘batlantirish.
- o‘qitish va malaka oshirish — trening, seminar va kurslar orqali xodimning rivojlanishiga imkon yaratish.
- yaxshi mehnat sharoiti — qulay ish joyi, zamonaviy texnika, xavfsiz mehnat muhiti yaratish.
- jamoada hurmat — xodimning fikrini inobatga olish, uni jamoaning muhim a‘zosi sifatida ko‘rsatish.

Nomoddiy motivatsiya xodimlarda tashkilotga sadoqatni oshiradi, jamoada ijobiy muhit shakllantiradi va kadrlar almashinuvi kamayishiga yordam beradi.

Motivatsiya tizimining ahamiyati

To‘g‘ri tashkil etilgan motivatsiya tizimi quyidagi natijalarga olib keladi:

- mehnat unumdorligi oshadi

- xodimlarning ishga qiziqishi kuchayadi
- jamoada sog‘lom muhit shakllanadi
- tashkilot foydasi ortadi
- kadrlar almashinuvi kamayadi

Shu sababli zamonaviy inson resurslarini boshqarish tizimida moddiy va nomoddiy motivatsiya usullarini birgalikda qo‘llash eng samarali yo‘l hisoblanadi.

Zamonaviy HR menejmentda motivatsiya tizimi individual yondashuv asosida tashkil etiladi.

4. Zamonaviy HR texnologiyalari

Bugungi kunda inson resurslarini boshqarishda raqamli texnologiyalardan keng foydalanilmoqda. Axborot-kommunikatsiya texnologiyalarining rivojlanishi natijasida tashkilotlarda kadrlar bilan ishlash jarayoni ancha soddalashti va samaradorligi oshdi. Zamonaviy HR texnologiyalari yordamida xodimlarni tanlash, ularning faoliyatini baholash, malakasini oshirish va rag‘batlantirish jarayonlari avtomatlashtirilgan holda amalga oshirilmoqda. Bu esa boshqaruv tizimini yanada takomillashtirishga xizmat qiladi.

Hozirgi vaqtda inson resurslarini boshqarishda quyidagi zamonaviy texnologiyalar qo‘llanilmoqda:

- **elektron kadrlar tizimi** — xodimlar haqidagi barcha ma’lumotlarni elektron shaklda saqlash va boshqarish imkonini beradi. Bu tizim orqali ishga qabul qilish, buyruqlar chiqarish, ta’til va ish haqi hisobini yuritish osonlashadi.
 - **HR analytics** — xodimlar faoliyati bo‘yicha statistik ma’lumotlarni yig‘ish va tahlil qilish tizimi. Ushbu usul yordamida kadrlar almashinuvi, ish unumdorligi va samaradorlik darajasini aniqlash mumkin.
 - **onlayn baholash tizimi** — xodimlarning bilim va ko‘nikmalarini masofadan turib test yoki topshiriqlar orqali baholash imkonini beradi. Bu usul vaqtni tejaydi va baholash jarayonining shaffofligini ta’minlaydi.
 - **masofaviy ish tizimi** — zamonaviy tashkilotlarda keng qo‘llanilayotgan usul bo‘lib, xodimlarga internet orqali turib ishlash imkonini yaratadi. Bu ayniqsa global kompaniyalarda samarali hisoblanadi.
 - **sun‘iy intellekt asosida tanlash** — maxsus dasturlar yordamida nomzodlarning ma’lumotlarini tahlil qilib, eng mos xodimni tanlash imkonini beradi. Bu usul inson omili bilan bog‘liq xatolarni kamaytiradi.
- Raqamli HR tizimidan foydalanish tashkilot faoliyatiga bir qator ijobiy ta’sir ko‘rsatadi. Jumladan:
- vaqtni tejaydi — ko‘plab jarayonlar avtomatik bajariladi;

- xatolarni kamaytiradi — inson omili ta'siri kamayadi;
- ma'lumotlarni tez tahlil qiladi — qaror qabul qilish jarayoni tezlashadi;
- boshqaruvni yengillashtiradi — rahbarlar kerakli ma'lumotlarni tezda olishi mumkin.

Zamonaviy HR texnologiyalaridan foydalanish natijasida inson resurslarini boshqarish tizimi yanada samarali ishlaydi. Bu esa o'z navbatida tashkilotning umumiy samaradorligini oshirish, mehnat unumdorligini ko'paytirish va raqobatbardoshligini kuchaytirishga xizmat qiladi. Shu sababli hozirgi kunda ko'plab rivojlangan davlatlar va yirik kompaniyalar kadrlar boshqaruvida raqamli texnologiyalarni keng joriy etmoqda.

5. Inson resurslarini boshqarish va tashkilot samaradorligi

Tadqiqotlar shuni ko'rsatadiki, HR tizimi yaxshi yo'lga qo'yilgan korxonalarda:

- mehnat unumdorligi yuqori
- foyda ko'p
- xodimlar almashinuvi kam
- innovatsiyalar ko'p
- ish sifati yaxshi bo'ladi

Inson kapitaliga investitsiya qilish eng foydali investitsiya hisoblanadi.

Xulosa qilib aytganda, inson resurslarini boshqarish tashkilot muvaffaqiyatining asosiy omillaridan biridir. Zamonaviy boshqaruv usullarini qo'llash, xodimlarni rag'batlantirish, ularni rivojlantirish va raqamli HR tizimlaridan foydalanish tashkilot samaradorligini sezilarli darajada oshiradi.

Kelajakda tashkilotlar raqobatbardosh bo'lishi uchun inson kapitaliga ko'proq e'tibor qaratishi zarur.

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A MODEL FOR FORMING ADAPTIVE LEARNING TRAJECTORIES IN DISTANCE EDUCATION BASED ON ARTIFICIAL INTELLIGENCE

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Abstract

In the context of digital transformation, the widespread integration of distance learning technologies in higher education has led to the emergence of new approaches to organizing the pedagogical process. Although distance learning platforms have significantly expanded access to educational resources and learning opportunities, many existing systems still lack mechanisms for effectively organizing instruction that accounts for the individual characteristics of students. Since learners differ in terms of prior knowledge, learning pace, interests, and academic performance, applying the same learning materials and instructional strategies to all students often reduces the overall effectiveness of the educational process.

This study proposes a pedagogical model for forming adaptive learning trajectories in distance education systems based on artificial intelligence technologies. The proposed model enables the generation of individualized learning pathways by analyzing students' learning activities, performance indicators, and knowledge levels. Through the use of intelligent data analysis and learning analytics, the model dynamically adapts educational content and instructional strategies to the needs of each learner. The results of the study demonstrate that the implementation of adaptive learning technologies in distance education environments can significantly improve learning efficiency, enhance student engagement, and support personalized learning processes in higher education.

Keywords: artificial intelligence, adaptive learning, distance education, pedagogical model, learning analytics.

Introduction

The rapid development of information technologies is causing significant transformations in modern education systems. In particular, distance learning platforms based on digital technologies contribute to increasing the flexibility and accessibility of the educational process. In recent years, the use of **Learning Management Systems (LMS)**, online learning platforms, and electronic educational resources has grown considerably in higher education institutions.

However, one of the major limitations of traditional distance learning systems is the uniform delivery of educational content to all students. Such an approach does not adequately account for the individual learning characteristics of students. As a result, the same learning materials may be too complex for some learners while being overly simple for others, which negatively affects the overall effectiveness of the learning process.

In pedagogical research and educational technologies, the concept of **adaptive learning** has been proposed as a solution to this challenge. Adaptive learning systems analyze students' knowledge levels, learning activities, and interests in order to generate individualized learning trajectories. This approach allows educational content and instructional strategies to be adjusted dynamically according to the needs and abilities of each learner.

The rapid advancement of **artificial intelligence (AI)** technologies has opened new opportunities for the development of adaptive learning systems. AI algorithms can analyze large volumes of educational data, model students' learning behaviors, and support the development of optimal instructional strategies tailored to individual learners.

The main objective of this study is to develop a model for forming adaptive learning trajectories in distance education systems based on artificial intelligence technologies and to evaluate its pedagogical effectiveness in improving the quality of the educational process.

Pedagogical Foundations of Adaptive Learning

Adaptive learning is a pedagogical approach aimed at organizing the educational process by taking into account students' individual characteristics and knowledge levels. Within this approach, learning materials are presented in accordance with the learner's current level of knowledge, learning pace, and cognitive abilities. Such personalization allows the learning process to be more effective by aligning educational content with the specific needs of each student.

Adaptive learning systems typically consist of several core components:

- **Student knowledge modeling**, which represents the learner's current level of understanding and competencies in a particular subject area;

- **Learning content modeling**, which structures educational materials according to complexity levels, topics, and learning objectives;
- **Pedagogical strategy modeling**, which defines instructional methods and rules for selecting appropriate learning activities;
- **Formation of individualized learning trajectories**, which determines the optimal sequence of learning materials and activities for each student.

In modern adaptive learning environments, technologies such as **learning analytics** and **educational data mining** are widely utilized. These technologies enable the analysis of large volumes of educational data generated during the learning process, including students' interactions with learning platforms, assessment results, and behavioral patterns.

Artificial intelligence algorithms play a significant role in adaptive learning systems by performing several key functions, including:

- assessing the student's knowledge level and learning progress;
- recommending appropriate learning materials based on individual needs;
- generating personalized learning trajectories;
- optimizing the overall learning process through continuous analysis and feedback.

Through the integration of artificial intelligence technologies, adaptive learning systems can dynamically adjust educational content and instructional strategies, thereby enhancing the efficiency and personalization of distance education environments.

Problems of Adaptive Learning in Distance Education Systems

Although the development of distance education systems has introduced new forms of organizing the learning process, their effectiveness is often limited by several pedagogical and technological challenges. In particular, the insufficient implementation of individualized learning approaches remains one of the major shortcomings of many distance education systems.

The first problem is the uniform presentation of learning materials to all students. In many distance learning platforms, educational resources are provided in a standardized format, and all students are expected to study the materials in the same sequence and structure. However, since students differ in terms of knowledge level, learning pace,

and interests, such an approach may reduce the overall effectiveness of the educational process.

The second problem is related to the limited mechanisms for accurately assessing students' knowledge levels. In many distance learning systems, assessment is primarily conducted through test results. However, a comprehensive evaluation of a student's knowledge should also consider other indicators, such as learning activity within the platform, task completion time, participation in discussions, and engagement with learning resources.

The third problem concerns the limited capability to monitor the learning process in real time. In many cases, instructors are unable to perform a comprehensive analysis of students' learning activities due to the large amount of data generated within online learning platforms. As a result, it becomes difficult to organize instruction based on an individualized approach.

To address these challenges, the use of artificial intelligence technologies plays an important role. Artificial intelligence algorithms can analyze large volumes of educational data generated during the learning process and identify individual learning patterns and characteristics of students. This enables the development of adaptive learning systems capable of dynamically adjusting educational content and instructional strategies.

The following table presents the main differences between traditional and adaptive learning systems.

Table 1
Comparison of Traditional and Adaptive Learning Systems

Indicator	Traditional System	Adaptive System
Learning materials	Same for all students	Individually adapted
Learning pace	Standardized	Adjusted to student ability
Monitoring	Limited	Continuous analysis
Decision-making	Teacher-based	Supported by artificial intelligence

As shown in the table, adaptive learning systems provide better opportunities for individualized instruction and more effective management of the educational process compared to traditional learning systems.

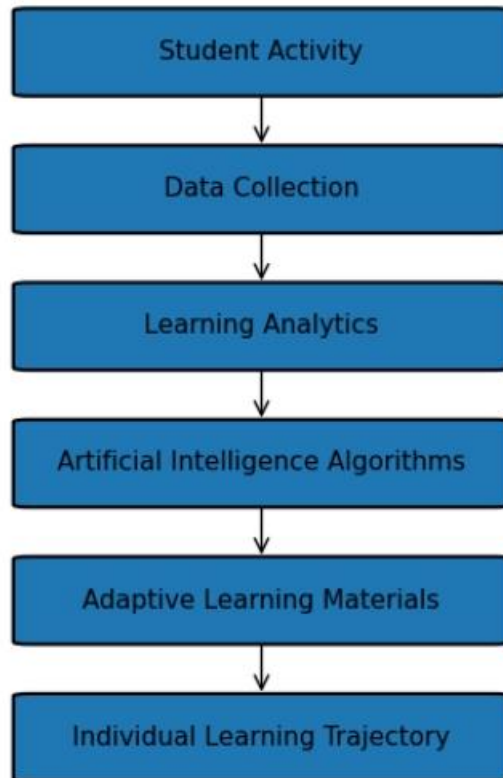
Pedagogical Model of Adaptive Learning

In this study, a pedagogical model for forming adaptive learning trajectories in distance education systems based on artificial intelligence was developed. The proposed model incorporates processes for collecting data on students' learning activities, analyzing these data, and generating individualized learning trajectories.

The proposed model consists of the following key components:

1. **Student Activity** – All learning activities of the student within the LMS platform are recorded, including interactions with learning materials, completion of assignments, and participation in discussions.
2. **Data Collection** – The data generated on the platform are stored in a centralized database, enabling further processing and analysis.
3. **Learning Analytics** – The collected data are analyzed using learning analytics technologies in order to identify learning patterns, performance indicators, and behavioral characteristics of students.
4. **Artificial Intelligence Algorithms** – Based on the analyzed data, AI algorithms construct a student knowledge model that reflects the learner's current level of understanding and learning progress.
5. **Adaptive Learning Materials** – Educational resources are dynamically selected according to the student's knowledge level and learning needs.
6. **Individual Learning Trajectory** – An optimal learning pathway is generated for each student, determining the sequence and complexity of learning materials.

Figure 1. Pedagogical Scheme of the Adaptive Learning Model



The proposed pedagogical model facilitates the organization of the educational process by taking into account the individual learning characteristics of students. Using this model, the student's knowledge level can be identified, and appropriate learning materials can be recommended accordingly. As a result, the learning process is organized based on a personalized approach, which contributes to improving the effectiveness of distance education.

Mechanism for Forming Adaptive Learning Trajectories

The process of forming an adaptive learning trajectory is carried out through several sequential stages.

In the **first stage**, the student's initial knowledge level is determined. For this purpose, diagnostic tests and data related to the student's previous learning activities are

analyzed. This stage allows the system to establish a baseline understanding of the learner's competencies and knowledge gaps.

In the **second stage**, the student's learning activity is continuously monitored. During this process, various indicators such as the student's activity on the learning platform, task completion time, assessment results, and level of engagement with learning resources are analyzed. Continuous monitoring enables the system to track learning progress and detect changes in the student's performance.

In the **third stage**, educational data are analyzed using artificial intelligence algorithms. Based on the collected and processed data, a **student knowledge model** is constructed. This model represents the learner's current level of understanding, identifies strengths and weaknesses, and provides the basis for selecting appropriate learning resources.

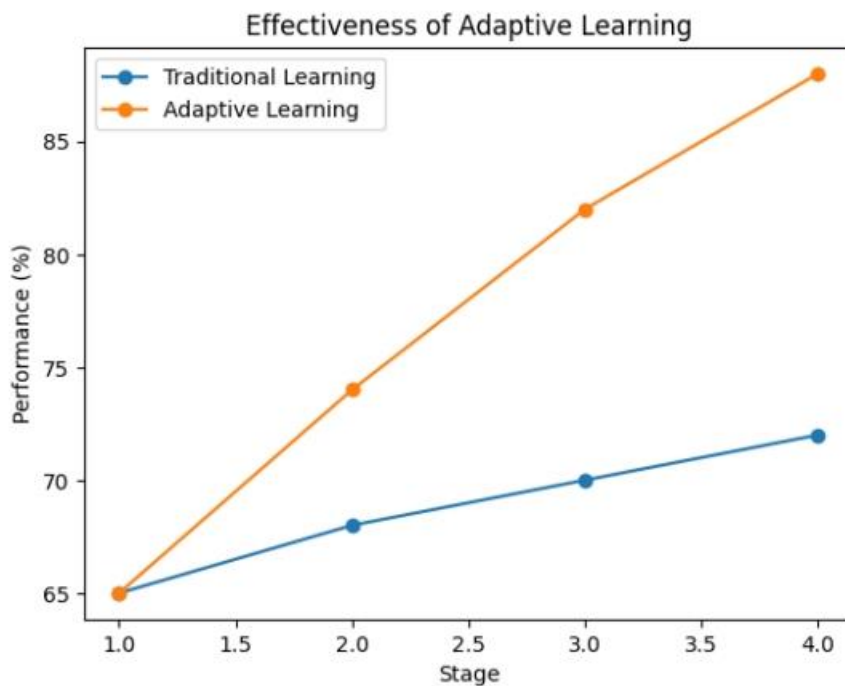
In the **fourth stage**, an **individual learning trajectory** is generated. At this stage, the system selects the most appropriate sequence of learning materials and educational activities according to the student's knowledge level, learning pace, and progress. As a result, the learning process becomes personalized and better aligned with the individual needs of each student.

Experimental Results

The proposed adaptive learning model was experimentally tested within a distance learning platform. The experiment involved several academic courses and a group of students participating in the learning process. During the study, the impact of the adaptive learning system on students' academic performance and learning outcomes was analyzed.

To evaluate the effectiveness of the proposed approach, students' knowledge levels were compared before and after the implementation of the adaptive learning system. The results of the study indicate that the use of adaptive learning technologies significantly improved students' academic performance and learning efficiency.

Figure 2. Effectiveness of Adaptive Learning



The results presented in the table demonstrate that the use of adaptive learning systems leads to a gradual improvement in students' knowledge levels. As the learning process progresses, the adaptive system continuously adjusts the educational content according to the learner's performance and learning behavior.

The formation of individualized learning trajectories plays a crucial role in organizing the learning process more effectively. By adapting educational materials to the student's abilities and progress, the system supports deeper understanding and improved learning outcomes.

Overall, the experimental results confirm that the integration of adaptive learning technologies into distance education systems can significantly enhance the effectiveness of the pedagogical process and contribute to improving the quality of education.

Conclusion

In this study, a pedagogical model for forming adaptive learning trajectories in distance education systems based on artificial intelligence technologies was developed. The proposed model enables the generation of individualized learning pathways by analyzing students' learning activities, knowledge levels, and academic performance indicators.

The results of the research demonstrate that the use of adaptive learning technologies contributes to improving students' knowledge levels, enhancing the effectiveness of the learning process, and organizing education based on an individualized approach. The application of artificial intelligence algorithms for analyzing educational data plays an important role in optimizing the teaching process and improving the overall quality of education.

Furthermore, adaptive learning systems provide new opportunities for organizing the pedagogical process more effectively within distance education environments. By forming individualized learning trajectories, it becomes possible to consider each student's learning needs, abilities, and progress. This approach contributes to increasing student motivation, improving academic performance, and ensuring the sustainability of learning outcomes.

Future research will focus on integrating the proposed adaptive learning model into real educational platforms, applying more advanced artificial intelligence algorithms for more accurate assessment of students' knowledge levels, and improving learning analytics technologies. In addition, the wider implementation of adaptive learning systems in higher education institutions may play an important role in supporting the digital transformation of the educational process and improving the quality of education.

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CYTOLOGIC EXAMINATION IN THE DIAGNOSIS OF ENDOMETRIAL CANCER

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Abstract. Combined cytological examination of endometrial material, which includes the combined use of traditional, liquid cytology and immunocytochemical research methods, correlates with the results of histological examination and leads to a decrease in the amount of uninformative material, compared with the use of traditional and liquid cytology separately, which increases the efficiency and accuracy of diagnosis in atypical hyperplasia and endometrioid adenocarcinoma.

Keywords: morphology, hyperplasia, endometrium, endometrioid adenocarcinoma.

Relevance. According to the WHO, 417,367 new cases of endometrial cancer (EC) were registered globally in 2020 (1,3,5,7,9). A steady increase in the incidence of EC has also been observed in Uzbekistan. In 2011, 20,821 new cases of EC diagnosed for the first time were identified, while in 2021, the number increased to 25,482 (2,4,6,8,10,12). Endometrial cancer (EC) accounts for more than 80% of EC cases (3,13). EC ranks first among malignant neoplasms of the female reproductive system in developed countries. Endometrioid adenocarcinoma constitutes the majority of EC cases. A morphological examination of uterine lining scrapings is a mandatory step in the diagnosis of endometrial neoplastic processes, determining treatment strategies and prognosis. Histological examination (HI) is currently considered the gold standard for morphological diagnosis. However, like any diagnostic method, it has a number of drawbacks (14,15). It should be noted that the use of this type of morphological examination is associated with inevitable anesthetic and surgical risks during separate diagnostic curettage (SDC), necessitating the search for new approaches to diagnosing endometrial pathologies aimed at reducing the invasiveness of the procedure, as well as the possibility of wider application of this method in outpatient settings.

Therefore, morphological examination remains highly relevant, aimed at systematically studying the structural disorganization of endometrioid uterine carcinoma at primary diagnosis. In this study, this disorganization refers to a combination of abnormalities in glandular architecture, spatial orientation of tumor glands, the nature of glandular-solid relationships, and epithelial-stromal relationships, reflecting the depth of the loss of normal tissue order in the endometrium. The

development and morphological substantiation of a holistic approach to the assessment of these changes, based on the integration of microscopic, immunohistochemical and, if necessary, ultrastructural features, seems to be a necessary step in refining the pathomorphological interpretation of endometrioid carcinoma of the uterus and increasing the reproducibility of the morphological conclusion in the conditions of routine diagnostic practice.

Objective of the study. Improving cytological diagnostics of atypical endometrial hyperplasia and endometrioid adenocarcinoma.

Materials and methods. The study included 136 patients who were examined and treated from 2022 to 2025 in the gynecology department of an oncology hospital in the Kharezm region. Based on clinical, ultrasound, and other indications, the patients underwent surgical treatment (hysteroscopy with RDV) or hysterectomy) followed by morphological examination of the endometrial material. The histological findings were divided into groups: no morphological pathology of the endometrium, n=31; endometrial hyperplasia or polyp, n=76; atypical endometrial hyperplasia, n=5; and endometrioid adenocarcinoma, n=24. An analysis of the histological findings with non-informative material was conducted. In some cases, it was impossible to assess the cellular composition of the specimens. This occurred for a number of reasons related to defects in the collection of biomaterial, such as the absence of endometrial cells, excessive blood content, or inflammatory elements. We assigned a cytological conclusion of "non-informative material" for both TC and LTC if fewer than five endometrial cell structures were detected. If the first cytological preparation for LTC was inadequate, a second preparation with a higher concentration of cellular material was prepared. If the second preparation was also unsatisfactory, a decision was made that the material was inadequate. Difficulties in assessing non-informative preparations prepared by the TC method were most often related to the abundance of blood elements. When using both cytological methods in combination, only 8 (5.9%) cases were assessed as inadequate. Histological examination of 31 patients revealed no morphological pathology of the endometrium. According to the TC results, two patients in this group had non-informative material; in 18 of 29 cases, the cytological diagnosis matched the histological diagnosis, representing a 62% percentage. According to the results of the life cycle analysis, four patients in this group had non-informative material, and in 20 of 26 cases, the cytological diagnosis coincided with the histological diagnosis (76.9%). In the cytological analysis, cellular elements appeared larger than in the life cycle analysis, caused by the cells "splaying" on the

slide during preparation. Focal cell accumulation was noted, and a crush phenomenon was pronounced. In the life cycle analysis, degenerative changes were less pronounced, and the nuclear structure was better preserved. Seventy-six patients were diagnosed with endometrial hyperplasia without atypia or polyps. Cytological examination of surgical specimens confirmed the cytological diagnosis with the histological diagnosis in 52 of 65 cases with informative TC specimens, representing 83.9%, and in 47 of 62 LCC specimens, representing 75.8%, respectively. TC specimens showed an increased number of glands and changes in their shape. Cell clusters were present, resembling dilated, branching glandular structures with nuclei overlapping in no more than three layers. Scattered lymphocyte infiltration was observed in the stroma, rich in fibroblast-like cells. Unlike TC specimens, background elements were virtually absent in LCC specimens, but enlarged prismatic cells were observed, arranged in sheets and cords. No significant differences were found in the expression of p53, p63, and PTEN markers between patients with adenocarcinoma and atypical endometrial hyperplasia and those with endometrioid hyperplasia without atypia ($p>0.05$). However, the observed changes in these parameters in the study groups may confirm the involvement of genetic factors in the pathogenesis of endometrial hyperplasia and open new avenues for the search for diagnostic markers for this pathology. Based on the obtained results, the CEA marker can be recommended as an additional diagnostic method for atypical hyperplasia and endometrioid adenocarcinoma of the endometrium. No significant differences were found in the expression of p53, p63, and PTEN markers between patients with adenocarcinoma and atypical endometrial hyperplasia and those with endometrioid hyperplasia without atypia ($p>0.05$).

Conclusions. When examining endometrial material in patients with atypical endometrial hyperplasia and adenocarcinoma, the findings of traditional and liquid-based cytology coincided with the histological findings in 100% of cases. Inadequate material was obtained in 11.8% of patients using liquid-based cytology, compared to 8.1% using traditional cytology. When using both cytological methods together, the incidence of inadequate material decreased to 5.9%, demonstrating the advantage of combining traditional and liquid-based cytology.

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TALABALARDA TANQIDIY FIKRLASH KO'NIKMALARINI RIVOJLANTIRISHNING ILMIY- NAZARIY ASOSLARI

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ANNOTATSIYA

Ushbu maqolada talabalarda tanqidiy fikrlash ko'nikmalarini rivojlantirishning ilmiy-nazariy asoslari tahlil qilinadi. Tanqidiy fikrlash tushunchasi, uning tuzilmasi hamda pedagogik xususiyatlari yoritiladi. Shuningdek, raqamli ta'lim texnologiyalaridan foydalanish orqali talabalarda mustaqil fikrlash, tahlil qilish va muammoli vaziyatlarga yechim topish ko'nikmalarini rivojlantirish modeli va metodikasi ko'rib chiqiladi.

Kalit so'zlar: *tanqidiy fikrlash, raqamli ta'lim, pedagogik texnologiyalar, talaba kompetensiyasi, tahliliy fikrlash, ta'lim jarayoni, innovatsion metodlar.*

АННОТАЦИЯ

В статье рассматриваются научно-теоретические основы развития навыков критического мышления у студентов. Раскрываются понятие, структура и педагогические особенности критического мышления. Также анализируется модель и методика формирования критического мышления студентов на основе цифровых образовательных технологий, направленных на развитие аналитических и самостоятельных мыслительных навыков.

Ключевые слова: *критическое мышление, цифровое образование, педагогические технологии, компетенции студентов, аналитическое мышление, образовательный процесс, инновационные методы.*

ABSTRACT

This article analyzes the scientific and theoretical foundations of developing critical thinking skills among students. The concept, structure, and pedagogical characteristics of critical thinking are discussed. The study also examines models and methods for developing students' critical thinking through digital educational technologies, aimed at improving analytical thinking, independent learning, and problem-solving skills.

Keywords: *critical thinking, digital education, pedagogical technologies, student competence, analytical thinking, educational process, innovative methods.*

KIRISH

Bugungi kunda jamiyatning barcha sohalarida axborot texnologiyalarining jadal rivojlanishi, globallashuv jarayonlarining kuchayishi hamda bilimga asoslangan iqtisodiyotning shakllanishi ta'lim tizimiga yangi talablarni qo'ymoqda. Zamonaviy jamiyat sharoitida insondan nafaqat keng bilimga ega bo'lish, balki mavjud axborotni tahlil qilish, uni baholash, turli muammoli vaziyatlarda mustaqil qaror qabul qilish hamda yangi g'oyalarni ilgari surish kabi ko'nikmalar ham talab etiladi. Shu sababli ta'lim jarayonida talabalar tafakkurini rivojlantirish, ayniqsa ularning tanqidiy fikrlash ko'nikmalarini shakllantirish dolzarb pedagogik masalalardan biri hisoblanadi.

Tanqidiy fikrlash zamonaviy ta'lim tizimida shaxsning intellektual rivojlanishini ta'minlovchi muhim omillardan biri sifatida qoraladi. Tanqidiy fikrlash orqali talaba o'rganilayotgan bilimlarni chuqur anglaydi, turli nuqtai nazarlarni solishtirib ko'ra oladi, dalillarga asoslangan xulosalar chiqaradi hamda muammolarga ijodiy yondashish imkoniyatiga ega bo'ladi. Bunday ko'nikmalar esa zamonaviy jamiyatda muvaffaqiyatli faoliyat yuritish uchun zarur bo'lgan asosiy kompetensiyalardan biri hisoblanadi.

Ilmiy adabiyotlarda tanqidiy fikrlash tushunchasi turli olimlar tomonidan turlicha talqin qilingan. Masalan, amerikalik olim R. Sternberg tanqidiy fikrlashni inson tomonidan muammolarni hal qilish, qaror qabul qilish va yangi bilimlarni o'zlashtirish jarayonida qo'llaniladigan aqliy jarayonlar majmui sifatida ta'riflaydi. P. Facione esa tanqidiy fikrlashni tahlil qilish, baholash, xulosa chiqarish va dalillar asosida qaror qabul qilishni o'z ichiga olgan yuqori darajadagi kognitiv faoliyat sifatida izohlaydi. R. Ennisning fikriga ko'ra, tanqidiy fikrlash – bu insonning nimaga ishonish yoki qanday harakat qilish kerakligini aniqlashga qaratilgan asosli va reflektiv fikrlash jarayonidir.

Zamonaviy ta'lim konsepsiyalarida tanqidiy fikrlash XXI asr kompetensiyalarining muhim tarkibiy qismi sifatida e'tirof etiladi. Jahon iqtisodiy forumi tomonidan e'lon qilingan "Future of Jobs" hisobotida tanqidiy fikrlash kelajak kasblari uchun zarur bo'lgan asosiy ko'nikmalardan biri sifatida qayd etilgan. Shu bilan birga, OECD Learning Compass 2030 konsepsiyasida ham tanqidiy fikrlash innovatsion g'oyalarni yaratish, muammolarni samarali hal qilish hamda jamiyat rivojiga hissa qo'shish uchun zarur bo'lgan muhim ko'nikmalardan biri sifatida ko'rsatiladi.

Oliy ta'lim tizimida talabalarni zamonaviy jamiyat talablariga mos ravishda tayyorlash uchun ularning tanqidiy fikrlash ko'nikmalarini rivojlantirish alohida ahamiyat kasb etadi. Chunki oliy ta'lim muassasalarida o'qitish jarayonida talabalar faqat tayyor

bilimlarni o'zlashtiribgina qolmay, balki ularni mustaqil ravishda tahlil qilish, baholash hamda yangi bilimlar yaratish jarayonida faol ishtirok etishlari lozim.

Shu nuqtai nazardan, talabalarda tanqidiy fikrlash ko'nikmalarini rivojlantirishning ilmiy-nazariy asoslarini o'rganish, ushbu jarayonning pedagogik xususiyatlarini aniqlash hamda raqamli ta'lim texnologiyalaridan foydalanish orqali tanqidiy fikrlashni rivojlantirishning samarali metodlarini ishlab chiqish muhim ilmiy va amaliy ahamiyatga ega.

ASOSIY QISM

Tanqidiy fikrlash pedagogika va psixologiya fanlarida keng o'rganilayotgan muhim ilmiy tushunchalardan biridir. Tanqidiy fikrlash insonning ma'lumotlarni tahlil qilish, baholash, solishtirish hamda asosli xulosalar chiqarish qobiliyatini ifodalaydi. Tanqidiy fikrlash jarayonida inson turli axborot manbalarini tahlil qiladi, ularning ishonchliligini baholaydi va mavjud dalillar asosida xulosa chiqaradi. Bu jarayon insonning fikrlash faoliyatini yanada samarali tashkil etishga yordam beradi.

Ilmiy tadqiqotlarda tanqidiy fikrlash yuqori darajadagi kognitiv faoliyat sifatida qaraladi. Ushbu faoliyat tahlil qilish, baholash, xulosa chiqarish, izohlash hamda refleksiya kabi jarayonlarni o'z ichiga oladi. Masalan, Facione tomonidan ishlab chiqilgan modelga ko'ra tanqidiy fikrlash quyidagi asosiy komponentlardan tashkil topadi: talqin qilish, tahlil qilish, baholash, xulosa chiqarish, izohlash va o'z fikrlash jarayonini nazorat qilish. Ushbu ko'nikmalar talabalarning analitik fikrlash qobiliyatini rivojlantirishda muhim rol o'ynaydi.

Tanqidiy fikrlash jarayonida inson faqat tayyor bilimlarni qabul qilib qolmaydi, balki ularni mustaqil ravishda tahlil qiladi va baholaydi. Bu esa talabalarning mustaqil fikr yuritish qobiliyatini rivojlantirishga yordam beradi. Tanqidiy fikrlash talabalarning bilimlarni chuqur o'zlashtirishiga, muammoli vaziyatlarni tahlil qilishiga hamda turli qarorlar qabul qilish jarayonida asosli fikr yuritishiga imkon yaratadi.

Tanqidiy fikrlashning muhim jihatlaridan biri uning ijodiy fikrlash, muammolarni hal qilish hamda reflektiv fikrlash bilan uzviy bog'liqligidir. Masalan, muammoli vaziyatni hal qilish jarayonida inson turli variantlarni ko'rib chiqadi, ularni tahlil qiladi va eng maqbul yechimni tanlaydi. Bu jarayonda tanqidiy fikrlash muhim rol o'ynaydi. Pedagogik nuqtai nazardan qaraganda, tanqidiy fikrlash talabalarning mustaqil ta'lim olish qobiliyatini rivojlantirishga xizmat qiladi. Zamonaviy ta'lim jarayonida talabalar faqat bilimlarni o'zlashtiruvchi emas, balki bilimlarni mustaqil ravishda izlovchi va tahlil qiluvchi faol subyekt sifatida qaraladi. Shu sababli ta'lim jarayonida talabalarning tanqidiy fikrlash ko'nikmalarini rivojlantirish uchun muammoli o'qitish,

loyiha asosida o'qitish, munozara va bahs-munozaralardan foydalanish muhim ahamiyatga ega.

Muammoli o'qitish metodida talabalarga aniq bir muammo beriladi va ular ushbu muammoni hal qilish jarayonida turli fikrlarni ilgari surishadi, dalillarni tahlil qilishadi hamda o'z xulosalarini asoslashadi. Bu jarayon talabalarning analitik fikrlash qobiliyatini rivojlantiradi.

Loyiha asosida o'qitish metodida esa talabalar ma'lum bir loyiha ustida ishlash jarayonida turli axborot manbalarini o'rganishadi, ularni tahlil qilishadi hamda o'z xulosalarini ishlab chiqishadi. Bu esa ularning mustaqil fikrlash qobiliyatini rivojlantiradi.

Zamonaviy ta'lim tizimida axborot-kommunikatsiya texnologiyalarining rivojlanishi ta'lim jarayoniga yangi imkoniyatlarni olib kirdi. Raqamli ta'lim texnologiyalari yordamida talabalarning tanqidiy fikrlash ko'nikmalarini rivojlantirish yanada samarali tashkil etilishi mumkin. Onlayn ta'lim platformalari, virtual laboratoriyalar, multimedia vositalari hamda interaktiv ta'lim tizimlari talabalarning o'quv jarayonida faol ishtirok etishini ta'minlaydi.

Raqamli ta'lim muhitida talabalar turli axborot manbalarini tahlil qilish, ma'lumotlarni solishtirish va mustaqil xulosalar chiqarish imkoniyatiga ega bo'ladilar. Masalan, onlayn forumlar, virtual munozaralar hamda interaktiv topshiriqlar talabalarning fikr almashish jarayonini faollashtiradi. Bu esa ularning tanqidiy fikrlash ko'nikmalarini rivojlantirishga yordam beradi.

Shuningdek, raqamli ta'lim texnologiyalari yordamida muammoli topshiriqlar, loyiha asosida o'qitish, tadqiqot faoliyati hamda interaktiv ta'lim metodlarini samarali tashkil etish mumkin. Bu usullar talabalarning analitik fikrlashini rivojlantirish bilan birga, ularning ijodiy yondashuvini ham shakllantiradi.

Natijada talabalarda muammolarni mustaqil tahlil qilish, turli fikrlarni solishtirish hamda asosli xulosalar chiqarish qobiliyati shakllanadi. Bu esa ularning akademik muvaffaqiyatini oshirish bilan birga, kelajak kasbiy faoliyatida ham muhim ahamiyat kasb etadi.

Shunday qilib, tanqidiy fikrlash zamonaviy ta'lim tizimining muhim tarkibiy qismi hisoblanadi. Talabalarda ushbu ko'nikmalarni rivojlantirish ularning intellektual salohiyatini oshirish, mustaqil fikrlash qobiliyatini shakllantirish hamda zamonaviy jamiyat talablariga mos mutaxassislarni tayyorlashda muhim ahamiyatga ega.

XULOSA

Zamonaviy ta'lim tizimida talabalarda tanqidiy fikrlash ko'nikmalarini shakllantirish va rivojlantirish muhim pedagogik vazifalardan biri hisoblanadi. Axborot

texnologiyalarining jadal rivojlanishi, globallashuv jarayonlarining kuchayishi hamda jamiyatning bilimga asoslangan rivojlanish modeli sharoitida insondan mustaqil fikrlash, mavjud ma'lumotlarni tahlil qilish va asosli qaror qabul qilish qobiliyati talab etilmoqda. Shu sababli oliy ta'lim muassasalarida talabalarning tanqidiy fikrlash ko'nikmalarini rivojlantirish ta'lim sifatini oshirishning muhim omillaridan biri hisoblanadi.

Tadqiqotlar shuni ko'rsatadiki, tanqidiy fikrlash insonning yuqori darajadagi kognitiv faoliyatini ifodalovchi muhim intellektual jarayon bo'lib, u tahlil qilish, baholash, xulosa chiqarish, izohlash hamda refleksiya kabi ko'nikmalarni o'z ichiga oladi. Ushbu ko'nikmalar talabalarning mustaqil fikrlashini rivojlantirishga, muammoli vaziyatlarni tahlil qilishga hamda turli qarorlar qabul qilish jarayonida asosli xulosalar chiqarishga yordam beradi. Tanqidiy fikrlash orqali talaba faqat tayyor bilimlarni o'zlashtiribgina qolmay, balki ularni mustaqil ravishda tahlil qiladi, baholaydi va yangi g'oyalar yaratish jarayonida faol ishtirok etadi.

Pedagogik nuqtai nazardan qaraganda, tanqidiy fikrlash ko'nikmalarini rivojlantirish uchun ta'lim jarayonida muammoli o'qitish, loyiha asosida o'qitish, bahs-munozara metodlari hamda tadqiqot faoliyatiga asoslangan ta'lim usullaridan foydalanish muhim ahamiyatga ega. Bunday metodlar talabalarning faolligini oshirish, ularning analitik tafakkurini rivojlantirish hamda mustaqil bilim olish ko'nikmalarini shakllantirishga xizmat qiladi.

Shuningdek, raqamli ta'lim texnologiyalarining rivojlanishi talabalarning tanqidiy fikrlash ko'nikmalarini rivojlantirish uchun yangi imkoniyatlarni yaratmoqda. Onlayn ta'lim platformalari, interaktiv ta'lim vositalari hamda virtual o'quv muhitlari yordamida talabalarning o'quv jarayonida faol ishtirok etishini ta'minlash, turli axborot manbalarini tahlil qilish va mustaqil xulosalar chiqarish qobiliyatini rivojlantirish mumkin. Tanqidiy fikrlash zamonaviy ta'lim tizimining muhim tarkibiy qismi bo'lib, talabalarning intellektual salohiyatini rivojlantirish, ularning mustaqil fikrlash qobiliyatini shakllantirish hamda kelajak kasbiy faoliyatida samarali faoliyat yuritishlari uchun zarur bo'lgan muhim kompetensiyalardan biridir. Shu sababli oliy ta'lim muassasalarida ta'lim jarayonini tashkil etishda tanqidiy fikrlash ko'nikmalarini rivojlantirishga qaratilgan innovatsion pedagogik metodlar va raqamli ta'lim texnologiyalaridan samarali foydalanish muhim ahamiyat kasb etadi.

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BO'LAJAK PEDAGOGLARDA KASBIY VA KOGNITIV KOMPETENSIYALARINI RIVOJLANTIRISH TEXNOLOGIYALARI

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Annotatsiya

Mazkur maqola bo'lajak pedagoglarning kasbiy va kognitiv kompetensiyalarini rivojlantirishning zamonaviy texnologiyalarini nazariy va amaliy jihatdan tahlil etishga bag'ishlangan. Tadqiqotda pedagog shaxsining kasbiy yetukligi, tanqidiy va kreativ fikrlash, muammoli vaziyatlarda mustaqil qaror qabul qilish, refleksiv yondashuv hamda raqamli savodxonlik kabi muhim kompetensiyalarni shakllantirish mexanizmlari yoritiladi. Maqolada kompetensiyaviy yondashuv asosida ta'lim jarayonini loyihalash, interfaol metodlar, muammoli o'qitish, loyiha asosida ta'lim, raqamli platformalar, simulyatsion mashg'ulotlar va metakognitiv strategiyalarni qo'llash orqali bo'lajak pedagoglarning kasbiy salohiyatini oshirish imkoniyatlari ko'rsatib beriladi. Shuningdek, kognitiv jarayonlarni (tahlil, sintez, baholash, refleksiya) faollashtirishga xizmat qiluvchi innovatsion pedagogik texnologiyalar tizimli ravishda asoslanadi. Tadqiqot natijalari shuni ko'rsatadiki, integrativ va texnologik yondashuv asosida tashkil etilgan ta'lim muhiti bo'lajak pedagoglarda nafaqat mustahkam nazariy bilim, balki amaliy ko'nikma, moslashuvchan tafakkur va kasbiy identifikatsiyani ham shakllantiradi. Mazkur maqola pedagog kadrlar tayyorlash jarayonini modernizatsiya qilish, ta'lim sifatini oshirish va innovatsion fikrlovchi mutaxassislarni tayyorlashga xizmat qiluvchi ilmiy-amaliy tavsiyalarni o'z ichiga oladi.

Annotation

This article is devoted to the theoretical and practical analysis of modern technologies for developing the professional and cognitive competencies of future teachers. The study highlights the mechanisms for forming key competencies such as professional maturity, critical and creative thinking, independent decision-making in problematic situations, a reflective approach, and digital literacy.

The article presents opportunities for enhancing the professional capacity of future teachers through the application of a competency-based approach to educational process design, including interactive methods, problem-based learning, project-based learning, digital platforms, simulation-based training, and metacognitive strategies.

Furthermore, innovative pedagogical technologies aimed at activating cognitive processes (analysis, synthesis, evaluation, and reflection) are systematically substantiated. The research findings indicate that an educational environment organized on the basis of an integrative and technological approach contributes not only to the formation of solid theoretical knowledge but also to the development of practical skills, flexible thinking, and professional identity among future teachers.

This article includes scientific and practical recommendations aimed at modernizing the teacher training process, improving the quality of education, and preparing innovative-thinking specialists.

Zamonaviy globallashuv va raqamli transformatsiya sharoitida ta'lim tizimi jamiyat taraqqiyotining strategik omiliga aylanmoqda. XXI asr ta'lim muhiti nafaqat bilim beruvchi tizim, balki shaxsning intellektual, ijtimoiy va kreativ salohiyatini rivojlantiruvchi murakkab ijtimoiy-madaniy makon sifatida namoyon bo'lmoqda. Shu nuqtai nazardan, bo'lajak pedagoglarning kasbiy va kognitiv kompetensiyalarini rivojlantirish masalasi pedagogika fanining dolzarb ilmiy yo'nalishlaridan biri sifatida e'tirof etilmoqda.

O‘zbekiston Respublikasida ta’lim tizimini modernizatsiya qilish davlat siyosatining ustuvor yo‘nalishlaridan biri hisoblanadi. O‘zbekiston Respublikasi Prezidenti Sh.M. Mirziyoyev ta’lim sohasini rivojlantirishga alohida e’tibor qaratib, zamonaviy bilim va kompetensiyalarga ega bo‘lgan pedagog kadrlarni tayyorlash jamiyat taraqqiyotining muhim omili ekanligini ta’kidlaydi. Jumladan, “Yangi O‘zbekiston strategiyasi” asarida mamlakat taraqqiyotining asosiy omillaridan biri sifatida raqobatbardosh kadrlarni tayyorlash, pedagogik ta’limni innovatsion texnologiyalar asosida rivojlantirish hamda yoshlarning intellektual salohiyatini yuksaltirish masalalari alohida qayd etilgan (Mirziyoyev, 2021).

Shuningdek, O‘zbekiston Respublikasining **“Ta’lim to‘g‘risida”gi Qonuni** hamda **“O‘zbekiston Respublikasida oliy ta’lim tizimini 2030 yilgacha rivojlantirish konsepsiyasi”** pedagog kadrlar tayyorlash sifatini tubdan takomillashtirishni, ta’lim jarayoniga zamonaviy pedagogik va raqamli texnologiyalarni joriy etishni ustuvor vazifa sifatida belgilaydi. Mazkur konsepsiyada oliy ta’lim tizimini modernizatsiya qilish, innovatsion pedagogik faoliyatni rivojlantirish, kompetensiyaviy yondashuv asosida ta’lim mazmunini yangilash zarurligi ta’kidlangan (PQ–5847, 2019).

Bundan tashqari, **2022–2026 yillarga mo‘ljallangan Yangi O‘zbekiston taraqqiyot strategiyasida** ham ta’lim tizimini rivojlantirish, pedagoglarning kasbiy mahoratini oshirish va innovatsion fikrlovchi yoshlarni tarbiyalash masalalari davlat siyosatining muhim ustuvor yo‘nalishlaridan biri sifatida belgilangan (PF–60, 2022).

Mazkur normativ-huquqiy hujjatlar pedagog kadrlar tayyorlash jarayonida kompetensiyaviy yondashuvni joriy etish, zamonaviy pedagogik texnologiyalar asosida bo‘lajak o‘qituvchilarning kasbiy va kognitiv kompetensiyalarini rivojlantirishni taqozo etadi. Chunki pedagog shaxsining kompetentligi ta’lim sifatini belgilovchi asosiy omillardan biri bo‘lib, u o‘quvchilarning mustaqil fikrlash qobiliyatini shakllantirish, innovatsion faoliyatni rivojlantirish va zamonaviy jamiyat talablariga mos mutaxassislarni tayyorlash jarayonida muhim ahamiyat kasb etadi.

Shu bois mazkur tadqiqot bo'lajak pedagoglarning kasbiy va kognitiv kompetensiyalarini rivojlantirish texnologiyalarining nazariy-metodologik asoslarini tahlil qilish, ularning tarkibiy komponentlarini aniqlash hamda pedagogik jarayonda samarali qo'llash mexanizmlarini ishlab chiqishga qaratilgan.

Kompetensiyaviy yondashuvning konseptual asoslari

Bo'lajak pedagoglarning kasbiy va kognitiv kompetensiyalarini rivojlantirish masalasi global ta'lim paradigmasining markaziy yo'nalishlaridan biri hisoblanadi. UNESCO tomonidan qabul qilingan "Education 2030" konsepsiyasida ta'lim natijasi sifatida faqat bilim emas, balki kompetensiyalar majmuasini shakllantirish ustuvor vazifa sifatida belgilangan (UNESCO, 2015).

Kompetensiyaviy yondashuvning nazariy ildizlari pragmatik pedagogika vakili John Dewey qarashlariga borib taqaladi. Unga ko'ra, ta'lim – bu tajriba orqali o'rganish jarayoni bo'lib, bilim real faoliyat jarayonida shakllanadi (Dewey, 1916). Mazkur g'oya loyiha asosida ta'lim va muammoli o'qitish texnologiyalarining nazariy poydevorini tashkil etadi.

Shuningdek, sotsiomadaniy rivojlanish nazariyasining asoschisi Lev Vygotsky ta'lim jarayonida ijtimoiy hamkorlik va "yaqin rivojlanish zonasi" tushunchasini ilgari surgan (Vygotsky, 1978). Bo'lajak pedagoglarni tayyorlash jarayonida mentorlik, kollaborativ o'qitish va reflektiv muhokamalar aynan ushbu nazariyaga tayanadi.

Kognitiv rivojlanish bosqichlari nazariyasi muallifi Jean Piaget esa tafakkur evolyutsiyasini mantiqiy operatsiyalar orqali izohlagan (Piaget, 1950). Bu yondashuv bo'lajak pedagoglarda analitik va mantiqiy fikrlashni rivojlantirishning psixologik asosini belgilaydi.

Kognitiv kompetensiyaning didaktik modeli

Kognitiv kompetensiya tarkibiy jihatdan tafakkur operatsiyalari tizimi bilan belgilanadi. Benjamin Bloom tomonidan ishlab chiqilgan taksonomiyaga ko'ra, bilimni egallash jarayoni bilish, tushunish, qo'llash, tahlil, sintez va baholash bosqichlarini o'z ichiga oladi (Bloom, 1956).

Mazkur maqolada taklif etilgan o'qitish texnologiyalari aynan yuqori darajadagi kognitiv operatsiyalarni (tahlil, baholash, yaratish) rivojlantirishga yo'naltirilgan.

Masalan:

muammoli vaziyatlar – tahliliy fikrlashni;

loyiha faoliyati – sintez va kreativlikni;

refleksiv esse – baholash kompetensiyasini rivojlantiradi.

Ko'p qirrali intellekt nazariyasini ilgari surgan Howard Gardner (1983) ta'lim jarayonida individual qobiliyatlarni hisobga olish zarurligini ta'kidlaydi. Shunga muvofiq, pedagogik tayyorgarlik jarayonida differensial yondashuv va moslashuvchan metodlardan foydalanish samarali hisoblanadi.

3. Kasbiy kompetensiyaning metodologik asoslari

Zamonaviy o'qituvchi modeli haqida Linda Darling-Hammond (2006) o'z tadqiqotlarida samarali pedagog tayyorgarligi refleksiya, amaliyot va tadqiqotchilik kompetensiyalarining integratsiyasiga asoslanishini ta'kidlaydi. Bu yondashuv maqolada taklif etilgan simulyatsion mashg'ulotlar va mikrodars metodikasiga nazariy tayanch bo'lib xizmat qiladi.

Ta'lim samaradorligini empirik asosda tahlil qilgan John Hattie (2009) o'qituvchining refleksiv faoliyati va "ko'rinadigan o'qitish" konsepsiyasi yuqori natijadorlikka olib kelishini isbotlagan. Shu sababli, bo'lajak pedagoglarni tayyorlash jarayonida o'z faoliyatini monitoring qilish va baholash mexanizmlarini joriy etish muhimdir.

Raqamli texnologiyalar asosida muammoli o'qitishni tashkil etish masalasini David Jonassen (2004) konstruktivistik texnologik muhit orqali izohlaydi. Uning fikricha, texnologiya bilimni uzatuvchi emas, balki muammoni hal etish vositasidir.

4. Milliy ta'lim siyosati kontekstida kompetensiyalar

O'zbekiston Respublikasida ta'lim tizimini modernizatsiya qilish jarayonida kompetensiyaviy yondashuv ustuvor yo'nalish sifatida belgilangan. Shavkat Mirziyoyev asarlarida va davlat dasturlarida pedagog kadrlar tayyorlash sifatini

oshirish, innovatsion fikrlovchi mutaxassislarni shakllantirish masalalari alohida qayd etilgan (Mirziyoyev, 2021).

Bu esa bo‘lajak pedagoglarning kasbiy va kognitiv kompetensiyalarini rivojlantirishni nafaqat didaktik, balki ijtimoiy buyurtma sifatida ham talqin qilish imkonini beradi.

Nazariy tahlillar shuni ko‘rsatadiki, bo‘lajak pedagoglarning kasbiy va kognitiv kompetensiyalarini rivojlantirish zamonaviy pedagogik ta’limning ustuvor vazifalaridan biri hisoblanadi. Tadqiqot davomida aniqlanishicha, mazkur jarayon konstruktivistik, sotsiomadaniy hamda kompetensiyaviy yondashuvlarning integratsiyasi asosida samarali amalga oshiriladi. Xususan, Deweyning tajribaviy ta’lim nazariyasi ta’lim jarayonida faol tajriba va amaliy faoliyatning ahamiyatini asoslab beradi, Vygotskiyning sotsiomadaniy rivojlanish konsepsiyasi esa hamkorlik va ijtimoiy muloqot orqali bilimni o‘zlashtirish jarayonini izohlaydi. Piaget tomonidan ishlab chiqilgan kognitiv rivojlanish modeli tafakkur operatsiyalarining bosqichma-bosqich shakllanishini ilmiy asoslab bersa, Bloom taksonomiyasi ta’lim jarayonida yuqori darajadagi kognitiv faoliyat – tahlil, baholash va yaratish ko‘nikmalarini rivojlantirish imkoniyatlarini ochib beradi.

Tadqiqot natijalari shuni ko‘rsatadiki, pedagogik ta’lim jarayonida kompetensiyaviy yondashuv asosida ishlab chiqilgan integrativ modelni qo‘llash bo‘lajak pedagoglarning kasbiy tayyorgarligini sezilarli darajada oshirishga xizmat qiladi. Mazkur model asosida tashkil etilgan ta’lim jarayoni bo‘lajak o‘qituvchilarda yuqori darajadagi tafakkur operatsiyalari, analitik va tanqidiy fikrlash qobiliyatlari, refleksiv tahlil ko‘nikmalari hamda pedagogik faoliyatni mustaqil rejalashtirish kompetensiyalarini shakllantirishga imkon yaratadi. Shu bilan birga, innovatsion pedagogik texnologiyalar, interfaol metodlar, loyiha asosida ta’lim va muammoli o‘qitish usullarining qo‘llanilishi pedagogik jarayon samaradorligini oshiradi hamda talabalarning ijodiy va tadqiqotchilik faoliyatini faollashtiradi.

Shuningdek, zamonaviy ta’lim muhitida raqamli texnologiyalarning keng joriy etilishi bo‘lajak pedagoglarning raqamli pedagogika madaniyatini rivojlantirishga xizmat

qiladi. Raqamli platformalar, simulyatsion mashg'ulotlar va metakognitiv strategiyalardan foydalanish ta'lim jarayonini yanada interfaol, moslashuvchan va samarali tashkil etish imkonini beradi. Bu esa bo'lajak pedagoglarning nafaqat nazariy bilimlarini mustahkamlash, balki amaliy faoliyatga tayyorligini ham oshiradi.

Umuman olganda, kompetensiyaviy yondashuv asosida ishlab chiqilgan pedagogik texnologiyalar tizimi pedagog kadrlar tayyorlash sifatini oshirish, ta'lim jarayonining innovatsion rivojlanishini ta'minlash hamda bo'lajak pedagoglarning kasbiy raqobatbardoshligini kuchaytirishning muhim ilmiy-amaliy mexanizmi hisoblanadi. Mazkur yondashuv pedagoglarni xalqaro ta'lim standartlariga mos ravishda tayyorlash, ularning kasbiy identifikatsiyasini shakllantirish hamda ta'lim jarayonida samarali faoliyat yurituvchi zamonaviy mutaxassislarni tayyorlashga xizmat qiladi.

Kelgusida mazkur yo'nalishda olib boriladigan ilmiy tadqiqotlar pedagogik ta'lim jarayoniga innovatsion pedagogik texnologiyalarni yanada keng joriy etish, kognitiv rivojlanish mexanizmlarini chuqur o'rganish hamda bo'lajak pedagoglarning kasbiy kompetensiyalarini rivojlantirishning yangi metodologik modellari va amaliy mexanizmlarini ishlab chiqishga qaratilishi maqsadga muvofiqdir.

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YASHIL IQTISODIYOT SHAROITIDA BARQAROR RIVOJLANISHNI TA'MINLASHNING IQTISODIY VA INSTITUTSIONAL OMILLARI

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Annotatsiya: Ushbu maqolada yashil iqtisodiyot sharoitida barqaror rivojlanishni ta'minlashning iqtisodiy va institutsional asoslari tahlil qilinadi. Atrof-muhitni muhofaza qilish, resurslardan samarali foydalanish, qayta tiklanuvchi energiya manbalarini rivojlantirish hamda ekologik xavfsizlikni ta'minlashda davlat siyosatining o'рни yoritilgan. Shuningdek, O'zbekiston iqtisodiyoti misolida yashil iqtisodiyotga o'tish jarayonining ustuvor yo'nalishlari, investitsiya siyosati va innovatsion texnologiyalarning ahamiyati ilmiy asosda bayon etilgan. Muallif tomonidan yashil iqtisodiyotni rivojlantirishda institutsional islohotlar, raqamli texnologiyalar va ekologik boshqaruv tizimini takomillashtirish bo'yicha takliflar berilgan.

Tayanch so'zlar: yashil iqtisodiyot, barqaror rivojlanish, ekologik xavfsizlik, qayta tiklanuvchi energiya, investitsiya, resurs tejash, innovatsiya, ekologik siyosat, iqtisodiy barqarorlik.

Annotation: This article analyzes the economic and institutional foundations of sustainable development in the context of the green economy. The role of state policy in environmental protection, efficient use of resources, development of renewable energy, and ecological safety is highlighted. Based on the example of Uzbekistan, priority directions for the transition to a green economy, investment policy, and innovative technologies are discussed. The author proposes recommendations for improving institutional reforms, digital technologies, and environmental management systems in developing the green economy.

Keywords: green economy, sustainable development, environmental safety, renewable energy, investment, resource efficiency, innovation, ecological policy, economic stability.

Аннотация: В статье рассматриваются экономические и институциональные основы обеспечения устойчивого развития в условиях зеленой экономики. Освещена роль государственной политики в охране окружающей среды,

рациональном использовании ресурсов, развитии возобновляемых источников энергии и обеспечении экологической безопасности. На примере Узбекистана показаны приоритетные направления перехода к зеленой экономике, значение инвестиций и инновационных технологий. Автором предложены рекомендации по совершенствованию институциональных реформ и системы экологического управления.

Ключевые слова: зеленая экономика, устойчивое развитие, экологическая безопасность, возобновляемая энергия, инвестиции, инновации, экономическая стабильность, экологическая политика.

Hozirgi kunda jahon iqtisodiyotida ekologik muammolarning kuchayishi, tabiiy resurslarning kamayib borishi va iqlim o'zgarishi jarayonlari iqtisodiy rivojlanishning yangi modelini shakllantirishni talab qilmoqda. Shu sababli ko'plab davlatlar barqaror rivojlanishni ta'minlash maqsadida yashil iqtisodiyot konsepsiyasiga o'tishni ustuvor vazifa sifatida belgilamoqda.

Yashil iqtisodiyot — bu iqtisodiy o'sishni ta'minlash bilan birga atrof-muhitni muhofaza qilish, resurslardan oqilona foydalanish va ekologik muvozanatni saqlashga qaratilgan iqtisodiy tizimdir. Ushbu modelda ishlab chiqarish va iste'mol jarayonlari ekologik xavfsizlik talablariga mos ravishda tashkil etiladi.

So'nggi yillarda O'zbekistonda ham yashil iqtisodiyotga o'tish, energiya samaradorligini oshirish, qayta tiklanuvchi energiya manbalarini kengaytirish va ekologik barqarorlikni ta'minlash bo'yicha keng ko'lamli islohotlar amalga oshirilmoqda.

Yashil iqtisodiyot tamoyillari iqtisodiy o'sish va ekologik muvozanatni birgalikda ta'minlashga qaratilgan bo'lib, zamonaviy rivojlanish modelining asosini tashkil etadi. Tabiiy resurslardan samarali foydalanish, chiqindilarni kamaytirish, qayta tiklanuvchi energiyani rivojlantirish, ekologik toza texnologiyalarni joriy etish, barqaror ishlab chiqarish va ekologik xavfsizlikni ta'minlash orqali mamlakatning uzoq muddatli iqtisodiy barqarorligiga erishish mumkin. Yashil iqtisodiyotning asosiy maqsadi iqtisodiy o'sish bilan bir qatorda ekologik muvozanatni saqlash, tabiiy resurslardan oqilona foydalanish va kelajak avlodlar uchun qulay yashash muhitini ta'minlashdan iborat. Ushbu model an'anaviy iqtisodiy rivojlanishdan farqli ravishda faqat daromad va ishlab chiqarish hajmini oshirishga emas, balki atrof-muhitni muhofaza qilish, energiya tejamkorligini oshirish va ekologik xavfsizlikni ta'minlashga ham alohida e'tibor qaratadi. Yashil iqtisodiyot konsepsiyasi barqaror rivojlanish tamoyillariga asoslanadi va iqtisodiy, ijtimoiy hamda ekologik manfaatlarning uyg'unligini ta'minlashni nazarda tutadi.

Yashil iqtisodiyot quyidagi asosiy tamoyillarga asoslanadi:

1. Tabiiy resurslardan samarali foydalanish

Yashil iqtisodiyotning muhim tamoyillaridan biri tabiiy resurslardan oqilona va tejamkor foydalanishdir. Yer, suv, gaz, neft, oʻrmon va foydali qazilmalar kabi resurslar cheklangan boʻlgani sababli ulardan samarali foydalanish iqtisodiy barqarorlikning asosiy sharti hisoblanadi. Resurslardan ortiqcha foydalanish ekologik muammolarni keltirib chiqaradi, shu sababli ishlab chiqarishda energiya tejovchi texnologiyalarni qoʻllash, suvni tejash, qayta ishlash tizimlarini rivojlantirish muhim ahamiyatga ega.

2. Chiqindilarni kamaytirish

Zamonaviy iqtisodiyotda ishlab chiqarish va isteʼmol jarayonlari koʻp miqdorda chiqindilar hosil qiladi. Yashil iqtisodiyot chiqindilarni kamaytirish, qayta ishlash va ularni ikkilamchi resurs sifatida foydalanishni nazarda tutadi. Chiqindilarni qayta ishlash orqali bir tomondan ekologik ifloslanish kamayadi, ikkinchi tomondan esa yangi iqtisodiy imkoniyatlar yaratiladi. Masalan, plastik, metall, qogʻoz va organik chiqindilarni qayta ishlash sanoatning yangi tarmoqlarini rivojlantirishga xizmat qiladi.

3. Qayta tiklanuvchi energiya manbalarini rivojlantirish

Yashil iqtisodiyotda energiya ishlab chiqarishda quyosh, shamol, suv, biomassa kabi qayta tiklanuvchi manbalardan foydalanish muhim oʻrin tutadi. Anʼanaviy energiya manbalari (neft, gaz, koʻmir) ekologik muammolarni keltirib chiqaradi va zaxiralari cheklangan. Shu sababli qayta tiklanuvchi energiya manbalarini keng joriy etish energiya xavfsizligini taʼminlaydi, atmosfera ifloslanishini kamaytiradi va iqtisodiyotning barqaror rivojlanishiga xizmat qiladi. Bugungi kunda koʻplab davlatlar quyosh va shamol elektr stansiyalarini qurish orqali yashil energetikani rivojlantirmoqda.

4. Ekologik toza texnologiyalarni joriy etish

Yashil iqtisodiyot ishlab chiqarish jarayonlarida atrof-muhitga zarar yetkazmaydigan yoki zararini minimal darajaga tushiradigan texnologiyalarni qoʻllashni talab qiladi. Ekologik toza texnologiyalar energiya sarfini kamaytiradi, chiqindilar miqdorini qisqartiradi va mahsulot sifatini oshiradi. Masalan, energiya tejamkor uskunalar, filtr tizimlari, suvni qayta tozalash texnologiyalari, ekologik transport vositalari yashil iqtisodiyotning muhim elementlari hisoblanadi.

5. Barqaror ishlab chiqarish va isteʼmol

Yashil iqtisodiyot faqat ishlab chiqarish jarayonini emas, balki isteʼmol madaniyatini ham oʻzgartirishni nazarda tutadi. Barqaror ishlab chiqarish deganda resurslarni tejagan holda mahsulot ishlab chiqarish, barqaror isteʼmol deganda esa ortiqcha sarf-

xarajatlardan voz kechib, ekologik toza mahsulotlardan foydalanish tushuniladi. Aholining ekologik madaniyatini oshirish, energiya va suvni tejash, chiqindilarni saralash kabi odatlar yashil iqtisodiyotning muhim qismi hisoblanadi.

6. Ekologik xavfsizlikni ta'minlash

Yashil iqtisodiyotning asosiy vazifalaridan biri inson salomatligi va atrof-muhit xavfsizligini ta'minlashdir. Atmosfera, suv va tuproqning ifloslanishi jamiyat rivojlanishiga salbiy ta'sir ko'rsatadi. Shu sababli ekologik nazorat tizimini kuchaytirish, zararli ishlab chiqarishni kamaytirish, yashil hududlarni kengaytirish va tabiiy muvozanatni saqlash davlat siyosatining muhim yo'nalishlaridan biri bo'lishi kerak. Ekologik xavfsizlik ta'minlangan sharoitda iqtisodiy rivojlanish ham barqaror bo'ladi.

Yashil iqtisodiyot modeli uzoq muddatli iqtisodiy barqarorlikni ta'minlash bilan birga, aholi salomatligini yaxshilash va tabiiy muhitni saqlashga xizmat qiladi.

O'zbekiston iqtisodiyotida yashil rivojlanish tendensiyalari

O'zbekistonda so'nggi yillarda ekologik barqarorlikni ta'minlashga qaratilgan muhim dasturlar amalga oshirilmoqda.

- quyosh va shamol elektr stansiyalari qurilmoqda;
- energiya tejovchi texnologiyalar joriy etilmoqda;
- suv resurslaridan samarali foydalanish choralari ko'rilmoqda;
- yashil hududlar kengaytirilmoqda;
- chiqindilarni qayta ishlash tizimi rivojlantirilmoqda.

Bu jarayonlar iqtisodiy o'sish bilan birga ekologik xavfsizlikni ta'minlashga xizmat qiladi.

Yashil iqtisodiyotni rivojlantirish bo'yicha takliflar

1. Yashil investitsiyalar uchun soliq imtiyozlarini kengaytirish
2. Ekologik toza texnologiyalarni joriy etishni rag'batlantirish
3. Qayta tiklanuvchi energiya ulushini oshirish
4. Ekologik ta'limni rivojlantirish
5. Raqamli ekologik monitoring tizimini yaratish
6. Davlat-xususiy sheriklik asosida yashil loyihalarni amalga oshirish
7. Ilmiy tadqiqot va innovatsiyalarni qo'llab-quvvatlash

Xulosa qilib aytganda, yashil iqtisodiyotga o'tish zamonaviy iqtisodiy rivojlanishning muhim sharti hisoblanadi. Resurslardan oqilona foydalanish, ekologik xavfsizlikni ta'minlash va innovatsion texnologiyalarni joriy etish orqali barqaror iqtisodiy o'sishga erishish mumkin.

Yashil iqtisodiyotni rivojlantirish davlat siyosati, investitsiyalar, ilm-fan va zamonaviy boshqaruv tizimining uyg'unligini talab qiladi. Ushbu yo'nalishda amalga oshiriladigan islohotlar milliy iqtisodiyotning uzoq muddatli barqaror rivojlanishini ta'minlaydi.

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MENEJMENTNING ZAMONAVIY TASHKILOT FAOLIYATIDAGI AHAMIYATI

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Annotatsiya: Mazkur maqolada menejmentning zamonaviy tashkilot faoliyatidagi oʻrni va ahamiyati yoritilgan. Menejmentning asosiy funksiyalari, boshqaruv usullari hamda samarali menejment orqali tashkilot faoliyatini rivojlantirish masalalari tahlil qilingan. Shuningdek, menejmentning inson resurslarini boshqarishdagi roli va zamonaviy boshqaruv yondashuvlari koʻrib chiqilgan.

Kalit soʻzlar: menejment, boshqaruv, tashkilot, rejalashtirish, nazorat, motivatsiya, samaradorlik, rahbarlik, inson resurslari, boshqaruv funksiyalari.

Bugungi kunda har qanday tashkilot faoliyatining muvaffaqiyati koʻp jihatdan menejment tizimining toʻgʻri tashkil etilishiga bogʻliq. Zamonaviy iqtisodiyot sharoitida raqobat kuchayib borayotganligi sababli tashkilotlar oʻz faoliyatini samarali boshqarishga alohida eʼtibor qaratmoqda. Menejment — bu tashkilotning barcha resurslarini toʻgʻri taqsimlash, rejalashtirish va nazorat qilish orqali belgilangan maqsadlarga erishish jarayonidir.

Menejment nafaqat iqtisodiy jarayonlarni, balki inson resurslarini, ishlab chiqarishni, moliyaviy faoliyatni va boshqaruv tizimini ham oʻz ichiga oladi. Shuning uchun menejment har qanday tashkilotning asosiy boshqaruv mexanizmi hisoblanadi.

Mazkur maqolaning maqsadi — menejmentning tashkilot faoliyatidagi ahamiyatini oʻrganish hamda uning asosiy funksiyalarini tahlil qilishdan iborat.

Menejment — bu tashkilot faoliyatini samarali tashkil etish, belgilangan maqsadlarga erishish va resurslardan oqilona foydalanishga qaratilgan boshqaruv jarayonidir. Menejment orqali tashkilotning rivojlanish yoʻnalishi belgilanadi, xodimlar faoliyati muvofiqlashtiriladi va natijalar nazorat qilinadi.

Zamonaviy menejment nazariyasiga koʻra, boshqaruv tizimi aniq reja, tartib va nazorat asosida olib borilishi kerak. Agar menejment toʻgʻri tashkil etilsa, tashkilotda samaradorlik oshadi, xodimlarning ishga boʻlgan qiziqishi kuchayadi va umumiy natija yaxshilanadi.

Menejmentning asosiy funksiyalari

Menejment bir nechta muhim funksiyalardan iborat bo‘lib, ular tashkilot faoliyatining barcha bosqichlarida qo‘llaniladi.

Rejalashtirish — tashkilot maqsadlarini belgilash va ularga erishish yo‘llarini aniqlash jarayonidir. Rejalashtirish orqali kelajakdagi vazifalar oldindan belgilanadi.

Tashkil etish — belgilangan rejalarni amalga oshirish uchun zarur sharoit yaratish, vazifalarni taqsimlash va xodimlar faoliyatini yo‘lga qo‘yishdir.

Boshqarish — xodimlarga topshiriq berish, ularni motivatsiya qilish va umumiy maqsad sari yo‘naltirish jarayonidir.

Muvofiqlashtirish — tashkilotdagi barcha bo‘limlar faoliyatini bir-biri bilan uyg‘unlashtirishdan iborat.

Nazorat qilish — bajarilgan ishlarni tekshirish, reja bilan solishtirish va kamchiliklarni bartaraf etish jarayonidir.

Ushbu funksiyalar menejment tizimining asosini tashkil qiladi.

Zamonaviy menejmentning ahamiyati

Hozirgi davrda menejmentning roli yanada ortib bormoqda. Bozor iqtisodiyoti sharoitida tashkilotlar o‘rtasida raqobat kuchayib borayotganligi sababli boshqaruv tizimini ilmiy asosda tashkil etish muhim ahamiyat kasb etmoqda. Zamonaviy tashkilotlar faqat buyruq va nazorat asosida emas, balki strategik rejalashtirish, innovatsion yondashuv, zamonaviy texnologiyalar hamda inson resurslarini samarali boshqarish orqali faoliyat yuritmoqda. Shu sababli menejment har qanday tashkilotning barqaror rivojlanishini ta‘minlovchi asosiy omillardan biri hisoblanadi. Zamonaviy menejment tizimi tashkilot faoliyatini rejalashtirish, tashkil etish, boshqarish, muvofiqlashtirish va nazorat qilish kabi funksiyalar orqali amalga oshiriladi. Ushbu funksiyalar bir-biri bilan uzviy bog‘liq bo‘lib, ularni to‘g‘ri qo‘llash tashkilot faoliyatining samaradorligini oshiradi. Ayniqsa, bugungi globallashuv sharoitida rahbarlardan nafaqat boshqaruv tajribasi, balki zamonaviy bilim, tahlil qilish qobiliyati va to‘g‘ri qaror qabul qilish mahorati talab etiladi.

Zamonaviy menejmentning muhim jihatlaridan biri — resurslardan oqilona foydalanishdir. Har bir tashkilot o‘z oldiga qo‘ygan maqsadlariga erishish uchun mavjud moddiy, moliyaviy va inson resurslaridan samarali foydalanishi zarur. Menejment tizimi to‘g‘ri yo‘lga qo‘yilgan bo‘lsa, ortiqcha xarajatlar kamayadi, ish jarayonlari tartibga tushadi va natijada yuqori samaradorlikka erishiladi.

Bugungi kunda inson resurslari menejmentning eng muhim tarkibiy qismi hisoblanadi. Chunki har qanday texnologiya yoki moliyaviy resursdan samarali foydalanish, avvalo, xodimlarning bilim va malakasiga bog‘liq. Shu sababli zamonaviy menejmentda xodimlarni tanlash, ularni o‘qitish, malakasini oshirish, rag‘batlantirish va baholash

jarayonlariga alohida e'tibor qaratiladi. Rahbar xodimlar bilan ishlashda psixologik yondashuvdan foydalanishi, ularning qiziqishi va ehtiyojlarini hisobga olishi lozim.

Samarali menejment quyidagi natijalarga olib keladi:

- tashkilotda tartib va intizom ta'minlanadi
- xodimlarning ishga bo'lgan qiziqishi ortadi
- mehnat unumdorligi oshadi
- resurslardan samarali foydalaniladi
- tashkilotning raqobatbardoshligi kuchayadi
- jamoada ijobiy psixologik muhit shakllanadi
- boshqaruv jarayonida aniqlik va barqarorlik ta'minlanadi
- tashkilotning uzoq muddatli rivojlanishi ta'minlanadi

Zamonaviy menejment sharoitida rahbar nafaqat buyruq beruvchi shaxs, balki jamoani birlashtira oladigan, xodimlarni ruhlantira oladigan va ularni umumiy maqsad sari yo'naltira oladigan shaxs bo'lishi kerak. Rahbarning bilimli, adolatli, mas'uliyatli va tashabbuskor bo'lishi jamoa samaradorligiga bevosita ta'sir ko'rsatadi.

Shu bilan birga, zamonaviy menejmentda innovatsion boshqaruv usullaridan foydalanish ham muhim hisoblanadi. Axborot texnologiyalaridan foydalanish, elektron boshqaruv tizimlari, strategik rejalashtirish va motivatsiya usullarini qo'llash orqali tashkilot faoliyatini yanada rivojlantirish mumkin. Bu esa tashkilotning ichki barqarorligini ta'minlab, tashqi raqobatda ustunlikka erishishga yordam beradi.

Shunday qilib, zamonaviy menejment har bir tashkilotning muvaffaqiyatli faoliyat yuritishida, iqtisodiy natijalarini yaxshilashda hamda jamoaning samarali ishlashini ta'minlashda muhim ahamiyat kasb etadi. Kelajakda tashkilotlarning rivojlanishi ko'p jihatdan menejment tizimining qanchalik to'g'ri tashkil etilganiga bog'liq bo'ladi.

Zamonaviy menejmentda rahbar nafaqat boshqaruvchi, balki tashkilot rivojlanishiga yo'l ko'rsatuvchi shaxs bo'lishi kerak.

Menejment tizimida inson resurslarini boshqarish

Tashkilot faoliyatida eng muhim omil — bu inson resurslari hisoblanadi. Har qanday tashkilotning muvaffaqiyati, avvalo, unda faoliyat yuritayotgan xodimlarning bilim darajasi, tajribasi, mas'uliyati va mehnatga bo'lgan munosabatiga bog'liq. Shu sababli menejment tizimida inson resurslarini to'g'ri boshqarish muhim o'rin tutadi. Zamonaviy boshqaruv nazariyasiga ko'ra, inson resurslari tashkilotning eng qimmatli boyligi hisoblanadi va ularni samarali boshqarish orqali yuqori natijalarga erishish mumkin.

Inson resurslarini boshqarish jarayoni menejmentning asosiy funksiyalariga tayanadi va u bir necha muhim vazifalarni o'z ichiga oladi. Ushbu vazifalar xodimlarni

tanlashdan boshlab, ularning malakasini oshirish, baholash va rag'batlantirishgacha bo'lgan barcha jarayonlarni qamrab oladi.

Inson resurslarini boshqarishda menejment quyidagi vazifalarni bajaradi:

Kadrlarni rejalashtirish — tashkilot uchun zarur bo'lgan xodimlar sonini aniqlash, ularning kasbiy malakasi, bilim darajasi va tajribasiga bo'lgan talabni belgilash jarayonidir. Rejalashtirish orqali kelajakda qanday mutaxassislariga ehtiyoj bo'lishi oldindan aniqlanadi va bo'sh ish o'rinlari yuzaga kelishining oldi olinadi.

Xodimlarni tanlash — tashkilotda mavjud bo'sh ish o'rinlariga eng munosib nomzodlarni saralash jarayonidir. Bu bosqichda suhbat, test, hujjatlarni tahlil qilish kabi usullardan foydalaniladi. To'g'ri tanlangan xodim tashkilot samaradorligini oshirishda muhim rol o'ynaydi.

Ishga joylashtirish — tanlangan xodimni uning bilim va ko'nikmalariga mos lavozimga qo'yish jarayonidir. Xodim o'z mutaxassisligiga mos ishda faoliyat yuritisa, uning mehnat unumdorligi yuqori bo'ladi. Shu sababli xodimni to'g'ri joylashtirish menejmentning muhim vazifalaridan biri hisoblanadi.

Malaka oshirish — xodimlarning bilim va ko'nikmalarini rivojlantirish, ularni qayta tayyorlash, treninglar, seminarlar va o'quv kurslari orqali kasbiy darajasini oshirish jarayonidir. Zamonaviy sharoitda texnologiyalar tez o'zgarib borayotganligi sababli xodimlarning doimiy ravishda o'qib-o'rganib borishi zarur. Malakali xodim tashkilot rivojlanishining asosiy omili hisoblanadi.

Baholash — xodimlarning ish faoliyati natijalarini aniqlash, ularning samaradorligini tahlil qilish va kelgusidagi rivojlanish yo'nalishlarini belgilash jarayonidir. Baholash orqali har bir xodimning kuchli va zaif tomonlari aniqlanadi hamda ularni yanada rivojlantirish chorasi ko'riladi.

Rag'batlantirish — xodimlarni samarali ishlashga undash, ularning mehnatini qadrlash va motivatsiyasini oshirish jarayonidir. Rag'batlantirish moddiy va nomoddiy shaklda bo'lishi mumkin. Moddiy rag'batlantirishga ish haqi, mukofot, qo'shimcha to'lovlar kiradi, nomoddiy rag'batlantirishga esa maqto'v, lavozim oshirish, faxriy yorliq berish kabi usullar kiradi. Rag'batlantirilgan xodim o'z ishiga mas'uliyat bilan yondashadi va yuqori natijaga erishadi.

Menejment tizimida inson resurslarini samarali boshqarish tashkilot faoliyatining barqaror rivojlanishini ta'minlaydi. Xodimlar bilan to'g'ri ishlash, ularni qo'llab-quvvatlash va rag'batlantirish orqali jamoada ijobiy muhit shakllanadi, mehnat unumdorligi oshadi va tashkilotning umumiy samaradorligi yuqori darajaga ko'tariladi.

Xulosa qilib aytganda, menejment har qanday tashkilot faoliyatining asosiy boshqaruv mexanizmi hisoblanadi. Menejment funksiyalarini to'g'ri qo'llash orqali tashkilot maqsadlariga tez va samarali erishish mumkin. Zamonaviy sharoitda rahbarlar ilmiy boshqaruv usullarini qo'llashi, xodimlar bilan to'g'ri ishlashi va samarali menejment tizimini yaratishi zarur.

Kelajakda tashkilotlarning muvaffaqiyati ko'p jihatdan menejment tizimining to'g'ri tashkil etilishiga bog'liq bo'ladi. Agar menejment to'g'ri tashkil etilsa, jamoada ijobiy muhit shakllanadi va tashkilot samaradorligi oshadi.

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MILLIY IQTISODIYOTGA XORIJIY INVESTITSİYALARNI JALB QILISHNING TASHKILIY-IQTISODIY ASOSLARI

O'zbekiston Milliy Iqtisodiy Hamkorlik Uyushmasi boshqaruv kengashi raisi

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Annotatsiya: Ushbu maqolada milliy iqtisodiyotga xorijiy investitsiyalarni jalb qilishning tashkiliy-iqtisodiy mexanizmlari, institutsional omillari va samaradorlik shartlari tahlil qilingan. Xalqaro tajriba, jahon iqtisodiy tendensiyalari va O'zbekiston misolida investitsiya muhitini shakllantirishning ustuvor yo'nalishlari yoritilgan. Shuningdek, investitsion jozibadorlikni oshirishda huquqiy kafolatlar, infratuzilma rivoji, soliq siyosati va davlat boshqaruvi samaradorligining o'rnini ilmiy asoslangan. Muallif tomonidan investitsiyalarni jalb qilish jarayonida strategik rejalashtirish va institutsional barqarorlikning ahamiyati yuzasidan takliflar berilgan.

Tayanch so'zlar: xorijiy investitsiya, milliy iqtisodiyot, investitsion muhit, institutsional islohotlar, iqtisodiy o'sish, kapital oqimi, investitsiya siyosati, iqtisodiy barqarorlik.

Annotation: This article analyzes the organizational and economic mechanisms, institutional factors, and efficiency conditions for attracting foreign investments into the national economy. It highlights international experience, global economic trends, and priority directions for shaping the investment environment in the case of Uzbekistan. Furthermore, the role of legal guarantees, infrastructure development, tax policy, and the effectiveness of public administration in enhancing investment attractiveness is scientifically substantiated. The author provides recommendations on the importance of strategic planning and institutional stability in the process of attracting investments.

Keywords: foreign investment, national economy, investment climate, institutional reforms, economic growth, capital flow, investment policy, economic stability.

Аннотация: В данной статье анализируются организационно-экономические механизмы, институциональные факторы и условия эффективности привлечения иностранных инвестиций в национальную экономику. Освещены международный опыт, мировые экономические тенденции и приоритетные направления формирования инвестиционной среды на примере Узбекистана. Также научно обоснована роль правовых гарантий,

развития инфраструктуры, налоговой политики и эффективности государственного управления в повышении инвестиционной привлекательности. Автором даны предложения по значению стратегического планирования и институциональной стабильности в процессе привлечения инвестиций.

Ключевые слова: иностранные инвестиции, национальная экономика, инвестиционная среда, институциональные реформы, экономический рост, поток капитала, инвестиционная политика, экономическая стабильность.

Jahon iqtisodiyoti globallashuv jarayoni chuqurlashib borayotgan sharoitda xorijiy investitsiyalar milliy iqtisodiyotlarning barqaror rivojlanishida muhim omil sifatida namoyon bo'lmoqda. Xalqaro Valyuta Jamg'armasi va Jahon banki ma'lumotlariga ko'ra, rivojlanayotgan mamlakatlarda iqtisodiy o'sishning o'rtacha 25–35 foizi to'g'ridan-to'g'ri xorijiy investitsiyalar hissasiga to'g'ri keladi. Xususan, to'g'ridan-to'g'ri xorijiy investitsiyalar (FDI) texnologiya transferi, yangi ish o'rinlari yaratilishi, eksport salohiyatining oshishi va raqobat muhitini kuchaytirish orqali iqtisodiyotni modernizatsiya qilishda muhim ahamiyat kasb etadi.

Iqtisodiy nazariyada investitsiyalar yalpi ichki mahsulot (YAIM) o'sishining asosiy drayverlaridan biri sifatida e'tirof etiladi. Klassik va zamonaviy makroiqtisodiy yondashuvlarda kapital qo'yilmalar ishlab chiqarish hajmini oshirish, bandlikni kengaytirish hamda milliy daromadni ko'paytirishning hal qiluvchi omili sifatida baholanadi. Xususan, neoklassik o'sish modelida kapital jamg'arilishi mehnat unumdorligini oshirish orqali iqtisodiy o'sishni ta'minlaydi, deb ta'kidlanadi. Ushbu modelga ko'ra, investitsiyalar hajmining ortishi ishlab chiqarish quvvatlarining kengayishiga, natijada esa YAIM o'sishiga xizmat qiladi.

Shu bilan birga, zamonaviy iqtisodiy fikrda endogen o'sish nazariyasi alohida ahamiyat kasb etadi. Mazkur yondashuvga ko'ra, iqtisodiy o'sish faqat kapital miqdori bilan emas, balki inson kapitali, innovatsiyalar, ilmiy-tadqiqot ishlari va texnologiyalar transferi bilan ham belgilanadi. Ayniqsa, xorijiy investitsiyalar orqali yangi bilimlar, ilg'or texnologiyalar va samarali boshqaruv tajribasining kirib kelishi milliy iqtisodiyotning sifat jihatdan yangilanishiga zamin yaratadi. Bu esa uzoq muddatli barqaror iqtisodiy o'sishni ta'minlashda muhim omil hisoblanadi.

Globallashuv sharoitida xorijiy investitsiyalar nafaqat moliyaviy resurs manbai, balki xalqaro iqtisodiy integratsiyaning muhim vositasiga aylandi. Rivojlanayotgan mamlakatlar uchun to'g'ridan-to'g'ri xorijiy investitsiyalar (TTXI) sanoatni modernizatsiya qilish, infratuzilmani rivojlantirish va eksport salohiyatini oshirishda

strategik ahamiyat kasb etadi. Shu bois, investitsiya muhitini yaxshilash, huquqiy kafolatlarni kuchaytirish va tadbirkorlik uchun qulay sharoit yaratish davlat iqtisodiy siyosatining ustuvor yo‘nalishlaridan biriga aylangan.

Xorijiy investitsiyalarning milliy iqtisodiyotga ta’siri quyidagi yo‘nalishlarda namoyon bo‘ladi:

- yangi texnologiyalar va boshqaruv tajribasini olib kirish;
- ishlab chiqarish samaradorligini oshirish;
- eksport hajmini kengaytirish;
- ichki bozorda raqobat muhitini shakllantirish.

UNCTAD ma’lumotlariga ko‘ra, 2023-yilda jahondagi umumiy to‘g‘ridan-to‘g‘ri xorijiy investitsiyalar hajmi taxminan 1,3 trillion AQSH dollarini tashkil etgan. Bu ko‘rsatkich global investitsiya oqimlarida muayyan qisqarish tendensiyalari mavjud bo‘lsa-da, rivojlanayotgan mamlakatlar o‘rtasida investitsiyalarni jalb qilish bo‘yicha raqobat tobora kuchayib borayotganini ko‘rsatadi. Shunday sharoitda milliy iqtisodiyotga xorijiy investitsiyalarni samarali jalb etish va ulardan oqilona foydalanish masalasi ilmiy-nazariy va amaliy jihatdan dolzarb ahamiyat kasb etadi.

Xorijiy investitsiyalarni jalb qilishning tashkiliy asoslari quyidagi institutlar va mexanizmlar orqali amalga oshiriladi:

1. Davlat investitsiya siyosati va strategiyasi
2. Investitsiyalarni himoya qilish bo‘yicha huquqiy kafolatlar
3. Soliq va bojxona imtiyozlari
4. Erkin iqtisodiy zonalar faoliyati
5. Davlat-xususiy sheriklik mexanizmlari

Investitsion muhitning jozibadorligi birinchi navbatda huquqiy barqarorlikka bog‘liq. Investorlar uchun mulk huquqining daxlsizligi, shartnomalar ijrosining kafolatlanganligi va sud tizimining mustaqilligi asosiy omillardan hisoblanadi.

O‘zbekiston misolida so‘nggi yillarda investitsiya muhitini yaxshilashga qaratilgan islohotlar amalga oshirildi. Xususan, soliq stavkalari pasaytirildi, litsenziyalash jarayonlari soddalashtirildi va raqamli davlat xizmatlari joriy etildi. Natijada 2017–2025-yillar oralig‘ida to‘g‘ridan-to‘g‘ri xorijiy investitsiyalar hajmi bir necha barobar oshgani kuzatildi.

2023-yilda O‘zbekistonga kiritilgan xorijiy investitsiyalar tarkibida Xitoy eng katta ulushga ega bo‘lgan (taxminan 20,5 %). Rossiya ikkinchi o‘rinda ($\approx 18,8$ %), Saudiya Arabistoni ($\approx 8,5$ %), Turkiya ($\approx 6,2$ %) kabi davlatlar ham sezilarli ulushga ega bo‘lgan.

2024-yilda O‘zbekistonga investitsiya kiritgan xorijiy davlatlar orasida eng yirik ulushga ega mamlakatlar

Jadval-1

Investitsiya kiritgan xorijiy davlatlar	Kiritilgan investitsiya ulushi (%)
Xitoy	27,9
Rossiya	13,2
Turkiya	6,8
Germaniya	5,2
Saudiya Arabistoni	5
Niderlandiya	4

2025-yilda (yanvar–sentabr / to‘liq yil ma’lumotlari asosida) O‘zbekistonga jalb qilingan investitsiya qiymati sezilarli darajada oshib, umumiy hajm taxminan 43,1 mlrd AQSH dollariga yetdi. Statistik ma’lumotlarga ko‘ra, eng faol investorlar Xitoy — eng yirik investor (taxminan 40 %), Rossiya — ~7–8 %, Turkiya — taxminan 7,7 %, Saudiya Arabistoni — ~3,8 %, Germaniya va Buyuk Britaniya ham sezilarli ulushga ega.

Bundan tashqari, 2025-yilda faoliyat yuritayotgan chet el sarmoyaviy korxonalar soni bo‘yicha ham Xitoy, Rossiya va Turkiya yetakchi o‘rinlarni egallagan.

Iqtisodiy jihatdan investitsiya jozibadorligi quyidagi omillarga bog‘liq:

- makroiqtisodiy barqarorlik;
- inflyatsiya darajasi;
- milliy valyuta barqarorligi;
- bozor sig‘imi;
- mehnat resurslari salohiyati;
- infratuzilma rivoji.

Xalqaro tajriba shuni ko‘rsatadiki, inflyatsiya darajasi 5–7 foiz atrofida barqaror bo‘lgan mamlakatlarda investitsiya oqimi yuqori bo‘ladi. Shuningdek, logistika va transport infratuzilmasi rivojlangan davlatlar xalqaro kapital uchun jozibador hisoblanadi.

Mening fikrimcha, xorijiy investitsiyalarni jalb qilishda faqat moliyaviy imtiyozlar yetarli emas. Eng muhim omil — ishonch muhitini shakllantirishdir. Investor uchun shaffoflik, korrupsiyaning past darajasi va prognoz qilinadigan iqtisodiy siyosat ustuvor ahamiyatga ega.

Investitsiyalarni jalb qilish samaradorligini oshirish masalasi nafaqat moliyaviy resurslarni ko‘paytirish, balki ulardan oqilona va maqsadli foydalanishni ham nazarda tutadi. Zamonaviy iqtisodiy sharoitda investitsiya siyosati kompleks va tizimli yondashuvni talab etadi. Quyida ushbu yo‘nalishlar kengaytirilgan holda bayon etiladi.

1. Institutsional islohotlarni chuqurlashtirish. Investitsiya muhitini yaxshilashning asosiy sharti — barqaror va shaffof institutsional tizimni shakllantirishdir. Bunda mulk huquqini ishonchli himoya qilish, sud-huquq tizimining mustaqilligi, byurokratik to‘siqlarni qisqartirish va korrupsiyaga qarshi kurashish muhim o‘rin tutadi. Qonunchilikning barqarorligi va prognoz qilinishi xorijiy investorlar uchun asosiy kafolat hisoblanadi. Shuningdek, “yagona darcha” tamoyili asosida davlat xizmatlarini ko‘rsatish investitsiya jarayonlarini sezilarli darajada yengillashtiradi.

2. Raqamli iqtisodiyotni rivojlantirish. Raqamli infratuzilmani kengaytirish, elektron hukumat tizimini takomillashtirish va davlat xizmatlarini raqamlashtirish investitsiya muhitining shaffofligini ta‘minlaydi. Fintex, elektron to‘lov tizimlari va raqamli logistika xizmatlarining rivojlanishi tadbirkorlik faoliyatini soddalashtiradi. Bundan tashqari, IT-parklar, startap ekotizimlari va innovatsion klasterlarni rivojlantirish yuqori qo‘shimcha qiymat yaratadigan investitsiyalarni jalb qilish imkonini oshiradi.

3. Ilmiy-texnik salohiyatni kuchaytirish. Innovatsion iqtisodiyotni shakllantirish investitsiyalarning sifatini belgilaydi. Ilmiy-tadqiqot institutlari, universitetlar va xususiy sektor o‘rtasida hamkorlikni kuchaytirish texnologiyalar transferini tezlashtiradi. Ilmiy ishlanmalarni tijoratlashtirish, venchur moliyalashtirish mexanizmlarini joriy etish hamda yuqori malakali kadrlar tayyorlash investitsiya jozibadorligini oshiradi. Bu jarayon uzoq muddatli barqaror iqtisodiy o‘sishni ta‘minlaydi.

4. Investitsiya loyihalarini baholash va monitoring tizimini takomillashtirish. Investitsiya loyihalarini saralashda iqtisodiy samaradorlik, ijtimoiy ta‘sir va ekologik barqarorlik mezonlarini hisobga olish zarur. Loyihalarni amalga oshirish bosqichlarida muntazam monitoring va audit o‘tkazish mablag‘lardan maqsadli foydalanishni ta‘minlaydi. Raqamli monitoring platformalari orqali ochiq ma‘lumotlar bazasini shakllantirish investitsiya jarayonlarining shaffofligini oshiradi va xavflarni kamaytiradi.

5. Eksportga yo‘naltirilgan ishlab chiqarishni rag‘batlantirish. Eksport salohiyati yuqori bo‘lgan tarmoqlarga soliq va bojxona imtiyozlari berish, logistika infratuzilmasini yaxshilash hamda xalqaro standartlarga mos sertifikatlash tizimini rivojlantirish investitsiya oqimini rag‘batlantiradi. Eksportchi korxonalarni moliyaviy qo‘llab-quvvatlash va tashqi bozorlarga chiqishda konsalting xizmatlarini ko‘rsatish milliy mahsulotlarning raqobatbardoshligini oshiradi.

Shuningdek, mamlakat brendini shakllantirish ham strategik ahamiyatga ega. Investitsiya forumlari, xalqaro ko‘rgazmalar va biznes-sammitlarda faol ishtirok etish

orqali mamlakatning investitsiyaviy salohiyati namoyish etiladi. Masalan, World Bankning “Doing Business” reytingi yoki World Economic Forumning Global raqobatbardoshlik indeksi kabi xalqaro reytinglarda yuqori o‘rinlarni egallash mamlakat imijiga ijobiy ta’sir ko‘rsatadi. Shu bilan birga, iqtisodiy diplomatiyani kuchaytirish, xorijiy davlatlar bilan ikki tomonlama investitsiya kelishuvlarini kengaytirish kapital oqimini oshirishda muhim vosita bo‘lib xizmat qiladi.

Xulosa qilib aytganda, investitsiyalarni jalb qilish samaradorligini oshirish kompleks islohotlar, innovatsion yondashuv va xalqaro hamkorlikni kuchaytirishni talab etadi. Bu esa milliy iqtisodiyotning barqaror va raqobatbardosh rivojlanishini ta’minlashga xizmat qiladi.

Milliy iqtisodiyotga xorijiy investitsiyalarni jalb qilish iqtisodiy o‘rinishning muhim strategik yo‘nalishi hisoblanadi. Tashkiliy-iqtisodiy mexanizmlarning samarali ishlashi investitsiya muhitining barqarorligi, huquqiy kafolatlar va institutsional islohotlar darajasiga bog‘liq. Tahlillar shuni ko‘rsatadiki, investitsiya oqimini oshirish uchun makroiqtisodiy barqarorlikni ta’minlash, raqamli boshqaruvni joriy etish va inson kapitaliga sarmoya kiritish zarur.

Muallif sifatida ta’kidlamochimanki, uzoq muddatli investitsiya siyosatining asosi — ishonch va barqarorlikdir. Agar davlat investitsiya muhitini tizimli ravishda yaxshilasa, milliy iqtisodiyot raqobatbardoshligi yanada mustahkamlanadi.

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INSON RESURLARINI BOSHQARISHDA LIDERLIK VA MENEJMENTNING AHAMIYATI

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Annotatsiya: Mazkur maqolada inson resurslarini boshqarish jarayonida liderlik va menejmentning o‘rni hamda ularning tashkilot samaradorligiga ta’siri tahlil qilinadi. Zamonaviy boshqaruv tizimida rahbarning liderlik qobiliyati, to‘g‘ri menejment usullarini qo‘llashi, xodimlarni motivatsiya qilish va jamoani boshqarish jarayonlari muhim omil hisoblanadi. Shuningdek, liderlik uslublari, menejment funksiyalari hamda inson resurslarini samarali boshqarishda zamonaviy yondashuvlar yoritilgan.

Kalit so‘zlar: inson resurslari, liderlik, menejment, boshqaruv, motivatsiya, jamoa, samaradorlik, HR menejment, rahbarlik, tashkilot.

Kirish

Bugungi kunda tashkilotlar faoliyatining samaradorligi ko‘p jihatdan inson resurslarini to‘g‘ri boshqarishga bog‘liq. Zamonaviy iqtisodiyotda texnologiya va kapital bilan bir qatorda inson omili ham muhim ahamiyat kasb etadi. Shu sababli inson resurslarini boshqarishda liderlik va menejment muhim o‘rin tutadi.

Liderlik – bu jamoani maqsad sari yetaklash qobiliyati bo‘lsa, menejment esa tashkilot faoliyatini rejalashtirish, tashkil etish, boshqarish va nazorat qilish jarayonidir. Rahbarning liderlik qobiliyati yuqori bo‘lsa, jamoada intizom, mas’uliyat va samaradorlik oshadi.

Hozirgi kunda inson resurslarini boshqarishda faqat buyruq berish usuli yetarli emas. Rahbar xodimlar bilan ishlashda psixologik yondashuv, motivatsiya, hamkorlik va ishonch muhitini yaratishi kerak. Shu sababli zamonaviy HR tizimida liderlik va menejment bir-biri bilan chambarchas bog‘liq holda qo‘llaniladi.

Mazkur maqolaning maqsadi — inson resurslarini boshqarishda liderlik va menejmentning ahamiyatini o‘rganish hamda ularning tashkilot samaradorligiga ta’sirini tahlil qilishdan iborat.

Menejment — bu tashkilot faoliyatini samarali tashkil etishga qaratilgan boshqaruv jarayonidir. Menejment orqali tashkilot maqsadlari belgilanadi va ularga erishish yo‘llari aniqlanadi.

Menejment — bu tashkilot faoliyatini samarali tashkil etish, belgilangan maqsadlarga erishish va resurslardan oqilona foydalanishga qaratilgan boshqaruv jarayonidir. Zamonaviy boshqaruv nazariyasiga ko‘ra, menejment bir necha asosiy funksiyalardan iborat bo‘lib, ular tashkilot faoliyatining barcha sohalarida, jumladan inson resurslarini boshqarishda ham muhim ahamiyat kasb etadi.

Menejmentning asosiy funksiyalari quyidagilardan iborat:

Rejalashtirish — tashkilotning kelajakdagi faoliyatini oldindan belgilash, maqsadlarni aniqlash va ularga erishish yo‘llarini ishlab chiqish jarayonidir. Rejalashtirish orqali tashkilotda qancha xodim kerakligi, ularning malakasi qanday bo‘lishi lozimligi ham aniqlanadi.

Tashkil etish — belgilangan rejalarni amalga oshirish uchun zarur sharoit yaratish, vazifalarni taqsimlash va xodimlar faoliyatini yo‘lga qo‘yish jarayonidir. Bu bosqichda har bir xodimning vazifasi, mas’uliyati va vakolati belgilanadi.

Boshqarish — xodimlar faoliyatini yo‘naltirish, ularga topshiriq berish, motivatsiya qilish va ularni umumiy maqsad sari birlashtirish jarayonidir. Boshqarish jarayonida rahbarning liderlik qobiliyati muhim rol o‘ynaydi.

Muvofiqlashtirish — tashkilotdagi barcha bo‘limlar va xodimlar faoliyatini bir-biri bilan uyg‘unlashtirish jarayonidir. Muvofiqlashtirish orqali jamoa bir maqsad sari harakat qiladi va ortiqcha ziddiyatlar oldi olinadi.

Nazorat qilish — bajarilgan ish natijalarini tekshirish, reja bilan solishtirish va kamchiliklarni aniqlash jarayonidir. Nazorat qilish orqali tashkilot faoliyatining samaradorligi baholanadi va zarur choralar ko‘riladi.

Menejmentning ushbu funksiyalari inson resurslarini boshqarish jarayonida ham keng qo‘llaniladi. Inson resurslarini boshqarishda menejment quyidagi vazifalarni bajaradi:

Kadrlarni rejalashtirish — tashkilot uchun zarur bo‘lgan xodimlar sonini va ularning malakasini aniqlash, kelajakdagi ehtiyojlarni oldindan belgilashdan iborat.

Xodimlarni tanlash — bo‘sh ish o‘rinlariga mos nomzodlarni aniqlash, suhbat va testlar orqali eng munosib xodimni saralash jarayonidir.

Ishga joylashtirish — tanlangan xodimni uning bilim va ko‘nikmalariga mos lavozimga qo‘yish, mehnat faoliyatini to‘g‘ri tashkil etishdan iborat.

Malaka oshirish — xodimlarning bilim va tajribasini rivojlantirish, ularni qayta tayyorlash, trening va seminarlar orqali kasbiy darajasini oshirish jarayonidir.

Baholash — xodimlarning ish faoliyati natijalarini aniqlash, ularning samaradorligini tahlil qilish va kelgusida rivojlantirish yo‘llarini belgilashdan iborat.

Rag‘batlantirish — xodimlarni samarali ishlashga undash uchun moddiy va nomoddiy mukofotlar berish, ularning mehnatini qadrlash hamda motivatsiyasini oshirish jarayonidir.

Shunday qilib, menejment funksiyalarini to‘g‘ri qo‘llash inson resurslarini samarali boshqarishga yordam beradi. Bu esa o‘z navbatida tashkilot faoliyatining barqaror rivojlanishi, mehnat unumdorligining oshishi hamda jamoada ijobiy muhit shakllanishini ta‘minlaydi.

To‘g‘ri tashkil etilgan menejment tizimi tashkilotda tartib, intizom va samaradorlikni ta‘minlaydi.

Liderlik tushunchasi va uning mohiyati

Liderlik — bu rahbarning jamoani o‘z ortidan ergashtira olish qobiliyatidir. Lider faqat buyruq beruvchi emas, balki jamoaga yo‘l ko‘rsatuvchi, motivatsiya beruvchi va muammolarni hal qiluvchi shaxsdir.

Zamonaviy boshqaruv nazariyasida liderlik inson resurslarini boshqarishning muhim tarkibiy qismi hisoblanadi. Tashkilot faoliyatining samaradorligi ko‘p jihatdan rahbarning liderlik qobiliyatiga bog‘liq bo‘ladi. Liderlik — bu jamoani umumiy maqsad sari yetaklash, xodimlarni ruhlantirish va ularning salohiyatidan samarali foydalanish qobiliyatidir. Menejer reja tuzadi va nazorat qiladi, lider esa jamoaga yo‘l ko‘rsatadi va ularni maqsad sari birlashtiradi. Shu sababli zamonaviy tashkilotlarda rahbar nafaqat menejer, balki kuchli lider ham bo‘lishi kerak.

Zamonaviy boshqaruv nazariyasiga ko‘ra, lider quyidagi asosiy xususiyatlarga ega bo‘lishi lozim:

Mas’uliyatli bo‘lish — lider o‘z qarorlari va jamoa faoliyati natijalari uchun javobgarlikni o‘z zimmasiga olishi kerak. Mas’uliyatli rahbar jamoada ishonch muhitini yaratadi.

Adolatli bo‘lish — rahbar barcha xodimlarga bir xil munosabatda bo‘lishi, ularni baholashda xolislikni saqlashi zarur. Adolatli lider jamoada hurmat qozonadi va nizolar kamayadi.

Kommunikativlik — lider xodimlar bilan erkin muloqot qila olishi, ularning fikrini tinglashi va to‘g‘ri tushuntirish bera olishi kerak. Yaxshi kommunikatsiya jamoaning birligini mustahkamlaydi.

Tashabbuskorlik — lider yangilik kiritishga intilishi, muammolarni hal qilishda faol bo‘lishi lozim. Tashabbuskor rahbar tashkilot rivojlanishiga katta hissa qo‘shadi.

Qaror qabul qila olish — rahbar murakkab vaziyatlarda tez va to‘g‘ri qaror qabul qila bilishi kerak. Qaror qabul qilish qobiliyati boshqaruv samaradorligini belgilaydi.

Jamoani ruhlantira olish — lider xodimlarni ishlashga undashi, ularga motivatsiya berishi va maqsad sari ilhomlantira olishi zarur. Ruhlangan jamoa yuqori natijalarga erishadi.

Liderlik uslublari boshqaruv jarayonida rahbarning xodimlarga qanday munosabatda bo‘lishini ifodalaydi. Boshqaruv nazariyasida liderlikning uchta asosiy uslubi mavjud:

Avtoritar liderlik — bu uslubda barcha qarorlarni rahbarning o‘zi qabul qiladi va xodimlardan faqat buyruqlarni bajarish talab etiladi. Bu uslub intizomni ta‘minlaydi, lekin xodimlarning tashabbuskorligini kamaytirishi mumkin.

Demokratik liderlik — bu uslubda rahbar qaror qabul qilishda jamoa fikrini inobatga oladi. Xodimlar boshqaruv jarayonida faol ishtirok etadi. Demokratik uslub zamonaviy tashkilotlarda eng samarali hisoblanadi, chunki u jamoada ishonch va hamkorlikni kuchaytiradi.

Liberal liderlik — bu uslubda rahbar xodimlarga ko‘proq erkinlik beradi va ularning mustaqil ishlashiga imkon yaratadi. Bu uslub yuqori malakali jamoalarda samarali bo‘lishi mumkin, lekin nazorat yetarli bo‘lmasa, tartibsizlik yuzaga kelishi mumkin. Shunday qilib, inson resurslarini boshqarishda liderlik muhim ahamiyatga ega bo‘lib, rahbarning shaxsiy fazilatlari va boshqaruv uslubi tashkilot samaradorligiga bevosita ta‘sir ko‘rsatadi. Zamonaviy boshqaruv tizimida demokratik va hamkorlikka asoslangan liderlik uslubi eng maqbul hisoblanadi.

Demokratik liderlik uslubi zamonaviy tashkilotlarda eng samarali hisoblanadi.

Liderlik va menejmentning inson resurslarini boshqarishdagi ahamiyati

Inson resurslarini samarali boshqarish uchun rahbar nafaqat menejer, balki lider ham bo‘lishi kerak. Menejer tartibni ta‘minlaydi, lider esa jamoani rivojlantiradi.

Liderlik va menejmentning birgalikdagi ahamiyati

Inson resurslarini boshqarishda liderlik va menejmentning birgalikda qo‘llanilishi tashkilot samaradorligini sezilarli darajada oshiradi. Menejment tizimning barqaror ishlashini ta‘minlasa, liderlik esa xodimlarni maqsad sari ilhomlantiradi va ularni rag‘batlantiradi. Shu sababli, ushbu ikki yondashuv bir-birini to‘ldiradigan muhim omil hisoblanadi.

Liderlik va menejment birgalikda qo‘llanilganda tashkilotda quyidagi ijobiy natijalar kuzatiladi:

- **Jamoada ijobiy muhit shakllanadi** — rahbarning liderlik qobiliyati jamoa a‘zolari o‘rtasida ishonch, hurmat va hamkorlikni mustahkamlaydi. Bu esa xodimlarning bir-biriga hurmat bilan munosabatda bo‘lishiga yordam beradi.

- **Xodimlarning ishga qiziqishi ortadi** — motivatsiya beruvchi rahbar xodimlarni faol ishlashga undaydi, ularni ragʻbatlantiradi va ularning kasbiy salohiyatini oshiradi.
- **Mehnat unumdorligi oshadi** — samarali menejment va ilhomlantiruvchi liderlik birlashganda xodimlar oʻz vazifalarini tez, sifatli va samarali bajaradi.
- **Nizolar kamayadi** — rahbar xodimlar oʻrtasidagi kelishmovchiliklarni vaqtida aniqlab, ularni hal qiladi. Bu jamoada barqarorlik va intizomni taʼminlaydi.
- **Tashkilot samaradorligi ortadi** — barcha jarayonlar rejalashtirilgan va nazorat qilinadigan boʻlsa, xodimlar motivatsiya qilingan boʻlsa, natijada tashkilot umumiy samaradorligi sezilarli darajada oshadi.

Shuni taʼkidlash lozimki, faqat menejment yoki faqat liderlik yondashuvi tashkilotning barqaror rivojlanishini taʼminlay olmaydi. Ularning birgalikdagi qoʻllanilishi jamoaning ruhiy holati, xodimlarning ishga boʻlgan qiziqishi va samaradorlikni oshirishga xizmat qiladi. Shu sababli zamonaviy tashkilotlarda rahbarlar nafaqat samarali menejer, balki ijobiy lider boʻlishi zarur.

Rahbarning liderlik qobiliyati yuqori boʻlsa, xodimlar oʻz ishiga masʼuliyat bilan yondashadi.

Xulosa qilib aytganda, inson resurslarini boshqarishda liderlik va menejment muhim ahamiyatga ega. Menejment tashkilot faoliyatini tartibga solsa, liderlik jamoani rivojlantiradi va samaradorlikni oshiradi. Zamonaviy tashkilotlarda rahbarlar liderlik qobiliyatiga ega boʻlishi zarur.

Kelajakda tashkilotlarning muvaffaqiyati koʻp jihatdan rahbarlarning liderlik salohiyatiga bogʻliq boʻladi.

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NAVRO‘Z AYYOMINING MILLIY-FALSAFIY AN‘ANALARI VA ULARNING YOSHLAR MA‘NAVIYATINI SHAKLLANTIRISHDAGI O‘RNI

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Annotatsiya: Mazkur maqolada Navro‘z ayyomining tarixiy ildizlari, milliy va falsafiy mazmuni hamda uning yoshlar ma‘naviy tarbiyasidagi o‘rni ilmiy jihatdan tahlil qilinadi. Navro‘z bayrami asrlar davomida xalqimizning milliy qadriyatlari, urf-odatlar, an‘analari va ma‘naviy qarashlari bilan uzviy bog‘liq holda shakllanganligi yoritiladi. Shuningdek, Navro‘z an‘analari orqali yoshlarda vatanparvarlik, insonparvarlik, mehr-oqibat, tabiatga hurmat kabi fazilatlarni shakllantirish imkoniyatlari asoslab beriladi.

Kalit so‘zlar: Navro‘z, milliy qadriyat, an‘ana, urf-odat, yoshlar tarbiyasi, ma‘naviyat, falsafa, madaniyat, vatanparvarlik, milliy meros.

Har bir xalqning ma‘naviy hayotida uning qadriyatlari, urf-odatlar va an‘analari muhim o‘rin tutadi. Milliy bayramlar esa xalqning tarixiy xotirasi, madaniy merosi hamda ma‘naviy dunyoqarashini aks ettiruvchi muhim omillardan biridir. Ana shunday qadimiy va ulug‘ bayramlardan biri Navro‘z hisoblanadi.

Navro‘z bayrami Sharq xalqlari, jumladan, o‘zbek xalqining eng qadimiy bayramlaridan biri bo‘lib, u tabiatning uyg‘onishi, yangi yilning boshlanishi, yangilanish va poklanish ramzi sifatida nishonlanadi. Ushbu bayram nafaqat tarixiy an‘ana, balki chuqur falsafiy mazmunga ega bo‘lgan ma‘naviy qadriyat hisoblanadi.

Bugungi globallashuv sharoitida yoshlarni milliy qadriyatlar ruhida tarbiyalash dolzarb masalalardan biri hisoblanadi. Yosh avlod ongida milliy o‘zlikni shakllantirish, ularni ajdodlar merosiga hurmat ruhida tarbiyalashda Navro‘z an‘analari muhim tarbiyaviy vosita bo‘lib xizmat qiladi.

Navro‘z ayyomi yoshlarni mehr-oqibat, saxovat, bag‘rikenglik, tabiatga ehtirom, ota-ona va kattalarga hurmat ruhida tarbiyalaydi. Shu sababli Navro‘zning milliy-falsafiy mazmunini o‘rganish hamda uning yoshlar ma‘naviyatini shakllantirishdagi o‘rnini ilmiy jihatdan tahlil qilish muhim ahamiyatga ega.

Navro'z bayramining tarixiy ildizlari va falsafiy mohiyati ko'plab olimlar tomonidan o'rganilgan. Sharq mutafakkirlari Navro'zni inson va tabiat uyg'unligining ramzi sifatida talqin qilganlar.

Abu Rayhon Beruniy o'z asarlarida Navro'z bayrami qadimiy xalqlarning yil boshi sifatida nishonlanganligini ta'kidlaydi. Uning fikricha, Navro'z tabiatning yangilanishi bilan bog'liq bo'lib, inson hayotida ham yangilanish va poklanish g'oyasini ifodalaydi. Alisher Navoiy asarlarida ham Navro'z bayrami insoniylik, saxovat va mehr-oqibat timsoli sifatida tasvirlanadi. Mutafakkir Navro'zni odamlarni yaxshilikka chorlovchi bayram sifatida baholaydi.

Milliy bayramlar yoshlar ongida tarixiy xotirani shakllantirishda muhim rol o'ynaydi. Ayniqsa, Navro'z an'analari orqali yoshlar milliy madaniyat, urf-odat va qadriyatlarni chuqur anglaydi.

1-jadval

Navro'z an'analari orqali yoshlar tarbiyasida shakllanadigan fazilatlar

№	Fazilat nomi	Mazmuni
1	Kattalarga hurmat	Navro'z bayramida ota-ona, ustoz va yoshi ulug' insonlarni ziyorat qilish an'anasi yoshlarni hurmat ruhida tarbiyalaydi
2	Kichiklarga mehr	Bayram kunlarida mehr-oqibat ko'rsatish, yordam berish odati yosh avlodda insonparvarlik tuyg'usini shakllantiradi
3	Tabiatga ehtirom	Daraxt ekish, obodonlashtirish, tabiatni asrash kabi urf-odatlar ekologik madaniyatni rivojlantiradi
4	Saxovat va bag'rikenglik	Muhtojlarga yordam berish, ehson qilish, sumalak ulashish saxovat va bag'rikenglikni tarbiyalaydi
5	Vatanparvarlik	Milliy bayramlarni nishonlash orqali yoshlar o'z xalqining tarixiga va yurtiga mehr bilan qarashni o'rganadi
6	Milliy qadriyatlarga sadoqat	Navro'z urf-odatlarini davom ettirish yoshlarning milliy an'analarga hurmatini kuchaytiradi

Navro'z bayrami xalqimizning eng qadimiy an'alaridan biri bo'lib, u inson va tabiat uyg'unligini ifodalaydi. Ushbu bayramda poklanish, yangilanish, yaxshilik qilish, mehr-oqibat ko'rsatish kabi g'oyalar mujassam.

Navro'z bayramida sumalak tayyorlash, hasharga chiqish, daraxt ekish, bemorlardan hol so'rash kabi urf-odatlar yoshlarni ezgulikka chorlaydi.

Yoshlar ushbu anʼanalari orqali jamiyat oldidagi masʼuliyatni his qiladi, milliy qadriyatlarga hurmat bilan qarashni oʻrganadi.

Navroʻzning falsafiy mazmuni insonni yaxshilik qilishga, pok niyat bilan yashashga, tabiat bilan uygʻunlikda boʻlishga undaydi.

Bugungi kunda yoshlar tarbiyasida milliy bayramlardan foydalanish maʼnaviy barkamol avlodni shakllantirishda muhim ahamiyatga ega.

Navroʻz ayyomi xalqimizning milliy-falsafiy qadriyatlarini oʻzida mujassam etgan muhim bayram hisoblanadi. Ushbu bayram yoshlar maʼnaviyatini shakllantirishda katta tarbiyaviy ahamiyatga ega.

Navroʻz anʼanalari orqali yoshlarda insonparvarlik, vatanparvarlik, mehr-oqibat, bagʻrikenglik va milliy gʻurur kabi fazilatlar shakllanadi.

Yuqoridagi tahlillar asosida quyidagi takliflarni berish mumkin:

1. Taʼlim muassasalarida Navroʻz bayramining tarbiyaviy ahamiyatini keng targʻib qilish zarur.

2. Yoshlar oʻrtasida milliy anʼanalarni oʻrgatishga qaratilgan tadbirlarni koʻpaytirish lozim.

3. Navroʻz bayramini maʼnaviy tarbiya vositasi sifatida foydalanish maqsadga muvofiq.

4. Milliy qadriyatlarni oʻrganishga bagʻishlangan dars va seminarlarni tashkil etish zarur.

5. Yoshlarni milliy merosga hurmat ruhida tarbiyalash davlat siyosatining muhim yoʻnalishi boʻlishi kerak.

Xulosa qilib aytganda, Navroʻz ayyomining milliy-falsafiy anʼanalari yoshlar maʼnaviyatini shakllantirishda muhim oʻrin tutadi va barkamol avlodni tarbiyalashda samarali vosita hisoblanadi.

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MUMTOZ ADABIY MATN LEKSIKASINI O'RGANISHNING ZAMONAVIY LINGVISTIK YONDASHUVLARI

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Annotatsiya

Mazkur maqolada mumtoz adabiy matn leksikasini o'rganishning zamonaviy lingvistik yondashuvlari tahlil qilinadi. Mumtoz adabiyot o'zbek tilining boy leksik qatlamini o'zida mujassam etgan muhim manbalardan biri hisoblanadi. Ushbu adabiy meros tilshunoslik, adabiyotshunoslik hamda madaniyatshunoslik nuqtai nazaridan katta ilmiy ahamiyatga ega. Maqolada mumtoz adabiy matnlar leksikasini tadqiq etishda qo'llanilayotgan zamonaviy lingvistik metodlar, jumladan semantik tahlil, lingvokulturologik yondashuv, korpus lingvistikasi va diskursiv tahlil masalalari yoritiladi. Shuningdek, mumtoz matnlarda uchraydigan arxaik so'zlar, tarixiy leksik birliklar hamda ularning zamonaviy til bilan bog'liqligi tahlil qilinadi. Tadqiqot natijalariga ko'ra, zamonaviy lingvistik yondashuvlar mumtoz adabiy matnlarning leksik xususiyatlarini chuqurroq o'rganish hamda ularning til va madaniyat tarixidagi o'rnini aniqlash imkonini beradi.

Kalit so'zlar: mumtoz adabiyot, leksika, lingvistik tahlil, semantik yondashuv, lingvokulturologiya, korpus lingvistikasi.

Annotation

This article examines modern linguistic approaches to the study of lexical features in classical literary texts. Classical literature represents an important source of the lexical richness of the Uzbek language and reflects the cultural and historical heritage of the nation. The study of the vocabulary used in classical literary texts is significant for linguistics, literary studies, and cultural studies. The article discusses modern linguistic methods used in analyzing classical texts, including semantic analysis, linguocultural approaches, corpus linguistics, and discourse analysis. Particular attention is given to archaic vocabulary, historical lexical units, and their relationship with modern language usage. The research findings demonstrate that modern linguistic approaches allow for a deeper understanding of lexical structures in classical texts and reveal their role in the development of language and culture.

Keywords: classical literature, lexicon, linguistic analysis, semantic approach, corpus linguistics, linguocultural studies.

Аннотация

В данной статье рассматриваются современные лингвистические подходы к изучению лексики классических литературных текстов. Классическая литература является важным источником богатства лексического состава узбекского языка и отражает культурно-историческое наследие народа. Изучение лексики классических текстов имеет большое значение для лингвистики, литературоведения и культурологии. В статье анализируются современные методы лингвистического исследования, включая семантический анализ, лингвокультурологический подход, корпусную лингвистику и дискурсивный анализ. Особое внимание уделяется архаической лексике, историческим языковым единицам и их связи с современным языком. Результаты исследования показывают, что современные лингвистические методы позволяют глубже изучить лексические особенности классических текстов и определить их роль в развитии языка и культуры.

Ключевые слова: классическая литература, лексика, лингвистический анализ, семантика, корпусная лингвистика, лингвокультурология.

Kirish

Mumtoz adabiyot xalqning tarixiy, madaniy va ma'naviy merosini o'zida aks ettiruvchi muhim manbalardan biridir. Bu adabiy meros tilshunoslik, adabiyotshunoslik va madaniyatshunoslik fanlari uchun qimmatli tadqiqot manbai hisoblanadi. Mumtoz adabiy matnlar tilning boy leksik qatlamini, uning tarixiy rivojlanish bosqichlarini hamda xalqning dunyoqarashini o'zida mujassam etadi.

Tilshunoslikda mumtoz matnlarni o'rganish jarayonida ularning leksik xususiyatlarini tahlil qilish muhim ilmiy ahamiyatga ega. Mumtoz adabiyotda qo'llanilgan so'zlar nafaqat tilning tarixiy taraqqiyotini, balki xalqning madaniy qadriyatlari va ma'naviy dunyoqarashini ham aks ettiradi. Shu sababli mumtoz matnlar leksikasini zamonaviy lingvistik metodlar asosida o'rganish dolzarb ilmiy muammolardan biri hisoblanadi.

Bugungi kunda tilshunoslik fanida matn tahlilining yangi yondashuvlari shakllanmoqda. Semantik tahlil, lingvokulturologik yondashuv, korpus lingvistikasi va diskurs tahlili kabi metodlar mumtoz matnlarning til xususiyatlarini chuqurroq o'rganish imkonini bermoqda.

Shu nuqtai nazardan qaraganda, mumtoz adabiy matn leksikasini o'rganishning zamonaviy lingvistik yondashuvlarini tadqiq etish ilmiy jihatdan muhim masala hisoblanadi.

Asosiy qism

Mumtoz adabiy matnlar o'zbek tilining boy va rang-barang leksik qatlamini aks ettiradi. Ushbu matnlarni o'rganish tilning tarixiy rivojlanish bosqichlarini aniqlash hamda leksik birliklarning semantik xususiyatlarini tahlil qilish imkonini beradi.

Zamonaviy tilshunoslikda mumtoz matnlar leksikasini o'rganishda bir qator ilmiy yondashuvlar qo'llanilmoqda. Shulardan biri semantik tahlil hisoblanadi. Semantik tahlil so'zlarning ma'no tuzilishini, ularning kontekstual qo'llanilishini hamda ma'no o'zgarishlarini o'rganishga qaratilgan.

Mumtoz matnlarda ko'plab arxaik va tarixiy so'zlar uchraydi. Bunday so'zlar zamonaviy til bilan solishtirish orqali ularning ma'no evolyutsiyasini aniqlash mumkin. Bu esa til tarixini o'rganishda muhim ilmiy natijalar beradi.

Lingvokulturologik yondashuv ham mumtoz matnlar leksikasini o'rganishda muhim ahamiyatga ega. Ushbu yondashuv til va madaniyat o'rtasidagi o'zaro bog'liqlikni tahlil qiladi. Mumtoz adabiy matnlarda uchraydigan leksik birliklar xalqning tarixiy tajribasi, urf-odatlar va ma'naviy qadriyatlari bilan chambarchas bog'liqdir.

Korpus lingvistikasi ham zamonaviy tilshunoslikning muhim yo'nalishlaridan biridir. Korpus lingvistikasi yordamida katta hajmdagi matnlarni elektron shaklda tahlil qilish mumkin. Bu usul mumtoz matnlarning leksik tarkibini statistik jihatdan o'rganish imkonini beradi.

Diskurs tahlili esa matnning kommunikativ vazifasini o'rganishga qaratilgan. Mumtoz adabiy matnlar nafaqat badiiy asar, balki ijtimoiy va madaniy diskursning ham muhim qismi hisoblanadi. Shu sababli ularning leksik xususiyatlarini diskursiv nuqtai nazardan tahlil qilish muhim ilmiy natijalar beradi.

Zamonaviy lingvistik tadqiqotlar mumtoz adabiy matnlar tilining boyligini va uning zamonaviy til rivojiga ta'sirini aniqlashga yordam beradi. Bunday tadqiqotlar tilning tarixiy ildizlarini o'rganish hamda milliy madaniy merosni saqlash nuqtai nazaridan ham muhim ahamiyatga ega.

Xulosa

Mumtoz adabiy matnlar o'zbek tilining tarixiy rivojlanishini aks ettiruvchi muhim lingvistik manbalardan biridir. Ularning leksik xususiyatlarini o'rganish til tarixini, madaniyatini va milliy qadriyatlarini chuqurroq anglash imkonini beradi.

Zamonaviy lingvistik yondashuvlar, jumladan semantik tahlil, lingvokulturologik yondashuv, korpus lingvistikasi va diskurs tahlili mumtoz matnlarning leksik tarkibini chuqur o'rganishda samarali ilmiy metodlar hisoblanadi.

Shu sababli mumtoz adabiy matn leksikasini zamonaviy lingvistik metodlar asosida tadqiq etish tilshunoslik fanining muhim yo'nalishlaridan biri bo'lib qolmoqda.

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BACHADON BO'YNI SARATONI KASALLIGINI KIMYOTERAPIYA BILAN DAVOLASHNING YUTUQ VA KAMCHILIKLARI

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Annotatsiya

Bachadon bo'yni saratoni (BBS) ayollar orasida eng ko'p uchraydigan onkologik kasalliklardan biridir. Kimyoterapiya, ayniqsa platina asosidagi agentlar va kombinatsion sxemalar, nur terapiyasi bilan birgalikda qo'llanganda umumiy omon qolish va progressiyasiz omon qolish ko'rsatkichlarini yaxshilaydi. Biroq nojo'ya ta'sirlar va dori rezistentligi muhim cheklovlardir. Ushbu maqolada mavjud adabiyotlar asosida kimyoterapiyaning yutuqlari, kamchiliklari va statistik natijalari tahlil qilinadi.

Kalit so'zlar: bachadon bo'yni saratoni, kimyoterapiya, sisplatin, paklitaksel, umumiy omon qolish, nojo'ya ta'sirlar, onkologiya.

Kirish. Bachadon bo'yni saratoni ayollar salomatligiga katta xavf soladi. Dunyo bo'yicha BBS bo'yicha beshinchi o'rinda ayollar o'limi holatlari qayd etiladi. Skrining va vaqtida davolash kasallik natijasini sezilarli o'zgartiradi, biroq rivojlangan bosqichlarda kimyoterapiya zarur bo'ladi. Sisplatin va uning kombinatsiyalari ko'pincha klinik protokollarda qo'llanadi [1-3].

Metod. Ushbu maqola yig'ilgan tadqiqotlar, meta-tahlillar va klinik natijalar tahlili asosida tayyorlandi. Asosiy mezonlar: umumiy omon qolish (OS), progressiyasiz omon qolish (PFS), javob ko'rsatkichlari, va nojo'ya ta'sirlar. Meta-tahlil va klinik retrospektiv tadqiqotlar natijalari solishtirildi [4-5].

Tadqiqot natijalari

1-Jadval. Kimyoterapiya va CCRT samaradorligi (asosiy ko'rsatkichlar)

Tadqiqot	Davolash sxemasi	OS (%)	PFS (%)	Izoh

Adjuvant paclitaxel+carboplatin + CRT vs faqat CRT	95.7 vs 82.5	93.5 vs 69.8	—	Adjuvant kimyoterapiya bilan yaxshilangan natija
CCRT (cisplatin) vs faqat radioterapiya	—	66 vs 60	—	CCRT 5-yillik omon qolishda yaxshilik
NACT + CCRT (cisplatin+paclitaxel) vs faqat CCRT	—	Ko'tarilgan OS va PFS	—	Meta-tahlil 2–5 yillik yaxshilanish

OS — umumiy omon qolish; PFS — progressiyasiz omon qolish; CRT — kimyoterapiya.

Jadval 2 — Kimyoterapiya bilan bog'liq nojo'ya ta'sirlar

Ta'sir turi	Cisplatin asosida CCRT	Cisplatin+Paclitaxel
Gematologik (Grade 3–4)	O'rtacha darajada	Yuqori darajada
Nefrotoksiklik	Ma'lum darajada	—
Neyrotoksiklik	—	Yuqori darajada
Gastrointestinal simptomlar	Odatda boshqariladi	Ko'proq kuzatiladi

Tadqiqot natijalari tahlili. Yuqoridagi natijalar kimyoterapiya, xususan platina asosidagi regimlar, BBS bilan og'rigan bemorlarda umumiy omon qolish va progressiyasiz omon qolishni yaxshilashini ko'rsatadi. CCRT (kimyo + nur) 5-yillik omon qolishni oshirishda radioterapiyadan ancha ustun ekanligi ko'plab meta-tahlillar orqali tasdiqlangan.

Sisplatin + paklitaksel kombinatsiyasi qisman yaxshiroq javob ko'rsatkichlarga ega, biroq gematologik toksiklik yuqoriroq bo'lishi mumkin.

Kimyoterapiya bilan bog'liq nojo'ya ta'sirlar hayot sifatiga salbiy ta'sir ko'rsatadi va bemorlarni qo'shimcha qo'llab-quvvatlovchi davolashni talab qiladi. Shu sababli individual yondashuv, nojo'ya ta'sirlarni kamaytirish va bemor ta'limi juda muhimdir.

Xulosa. Bachadon bo'yni saratonini kimyoterapiya bilan davolashning yutuqlari:

- CCRT umumiy omon qolishni oshiradi
- Adjuvant kimyoterapiya ba'zan yaxshiroq natijalar beradi
- NACT + CCRT bilan OS va PFS ko'rsatkichlari yaxshilanadi

Kamchiliklari esa

- Kuchli gematologik va tizimli nojo‘ya ta’sirlar
- Kombinatsion sxemalar toksiklikni oshiradi
- Individual javob farqliligi va dori rezistentligi mavjud

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**ELEKTROLITIK DISSOTSIYALANISH MAVZUSINI O'QITISHDA
VIRTUAL LABORATORIYA TEXNOLOGIYASIDAN FOYDALANISH
METODIKASI**

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Annotatsiya. Zamonaviy ta'lim tizimida virtual laboratoriyani joriy etish jarayoni tez sur'atlarda rivojlanmoqda. Xususan, kimyo fanidagi elektrolitik dissotsiyalanish mavzusini o'qitishda virtual laboratoriyalardan foydalanish o'rganuvchilarning nazariy bilimlarini mustahkamlash, murakkab jarayonlarni vizual tarzda tushuntirish hamda xavfsiz tajriba muhitini yaratishda muhim ahamiyat kasb etadi. Virtual laboratoriyalar kompyuter simulyatsiyalari orqali kimyoviy jarayonlarni modellashtirish imkonini beradi. Ushbu texnologiyalar an'anaviy laboratoriya mashg'ulotlarini to'ldiruvchi innovatsion vosita sifatida kimyo ta'limi samaradorligini oshiradi. Mazkur maqolada Elektrolitik dissotsiyalanish mavzusini o'qitishda virtual laboratoriyani qo'llash uning kimyo ta'limidagi o'rni, an'anaviy laboratoriya bilan taqqoslanishi, o'rganuvchilarning bilim va ko'nikmalarini rivojlantirishdagi roli hamda ushbu texnologiyaning afzalliklari tahlil qilinadi.

Kalit so'zlar: elektrolit, elektrolitik dissotsiyalanish, virtual laboratoriya, kimyo ta'limi, simulyatsiya, raqamli pedagogika, innovatsion ta'lim, kimyoviy modellashtirish, interaktiv ta'lim.

Kirish

Ta'lim jarayonini raqamlashtirish, o'quvchilarni interaktiv muhitda o'qitish hamda murakkab ilmiy tushunchalarni vizual vositalar orqali tushuntirish bugungi zamonaviy pedagogikaning ustuvor yo'nalishlaridan biri hisoblanadi. Ayniqsa, kimyo

fanida ko‘plab hodisa va jarayonlar molekulyar hamda ion darajada sodir bo‘lishi sababli ularni o‘quvchilarga oddiy og‘zaki izoh yoki doskadagi formulalar orqali to‘liq anglatish qiyin kechadi. Shunday mavzulardan biri elektrolitik dissotsiyanish mavzusidir. Mazkur mavzu eritmadagi ionlar, elektr o‘tkazuvchanlik, kislota, asos va tuzlarning dissotsiyanishi kabi fundamental tushunchalarni o‘z ichiga oladi. Bu tushunchalar abstrakt xarakterga ega bo‘lib, ularni ko‘rish yoki bevosita kuzatish imkoni mavjud emas. Shu bois ushbu mavzuni o‘qitishda virtual laboratoriya texnologiyalaridan foydalanish ta’lim samaradorligini oshirishning muhim omillaridan biri hisoblanadi. Virtual laboratoriyalar yordamida o‘quvchilar nafaqat nazariy bilimlarni egallaydi, balki ionlarning harakati, moddalarning eritmadagi holati va elektr o‘tkazuvchanlik sabablarini vizual hamda amaliy tarzda tushunib oladi.

Elektrolitik dissotsiyanish mavzusini o‘qitish uchun virtual laboratoriya modeli

Virtual laboratoriya kompyuter, planshet yoki interaktiv doska orqali kimyoviy tajribalarni simulyatsiya qiluvchi o‘quv muhitidir. Mazkur mavzu uchun virtual laboratoriya quyidagi modullardan tashkil topadi:

- Nazariy kirish oynasi;
- Reaktivlarni tanlash bo‘limi;
- Eritma tayyorlash bo‘limi;
- Elektr o‘tkazuvchanlikni tekshirish bloki;
- Ionlarning harakatini ko‘rsatish animatsiyasi;
- Natijalarni tahlil qilish va xulosa chiqarish oynasi;
- Nazorat savollari va test moduli.

Kutilayotgan natijalar:

- elektrolitik dissotsiyanish mohiyatini tushuntira oladi;
- elektrolit va noelektrolit moddalarni farqlay oladi;
- eritmaning elektr o‘tkazuvchanligini ionlar bilan bog‘lay oladi;

- dissotsiyalanish tenglamalarini yozadi;
- virtual tajribadan xulosa chiqara oladi.

Jihozlar (virtual):

- virtual probirkalar;
- stakan va eritmalar;
- lampochkali elektr zanjiri;
- grafit elektrodlar;
- modda tanlash menyusi;
- ionlar harakatining animatsion ko‘rinishi;
- natijalarni qayd etish jadvali.

Virtual laboratoriya mashg‘ulotining bosqichlari

1-bosqich. Motivatsiya va muammoli savol

Ekranida quyidagi savol chiqadi: “Nima sababdan ayrim eritmalar elektr tokini o‘tkazadi, ayrimlari esa yo‘q?”

Shundan so‘ng o‘quvchilarga NaCl, HCl, NaOH, shakar, etil spirti va distillangan suv taklif qilinadi. O‘quvchilardan qaysi biri tok o‘tkazishi va buning sababi haqida taxmin qilish so‘raladi.

2-bosqich. Moddani tanlash

O‘quvchi virtual panel orqali NaCl, HCl, CH₃COOH, NaOH, NH₄OH yoki shakar eritmasidan birini tanlaydi. Tanlangan modda suvga qo‘shiladi.

3-bosqich. Eritmaning hosil bo‘lishi

Ekranida moddaning suvga qo‘shilgandagi animatsiyasi ko‘rsatiladi. NaCl misolida kristall panjara suv molekullari bilan o‘raladi va ionlar ajralib chiqadi. Shakar misolida esa molekullar eriydi, ammo ionlarga ajralmaydi.

4-bosqich. Elektr o‘tkazuvchanlikni tekshirish

O'quvchi eritmaga elektrodnlarni tushiradi va zanjirni ulaydi. NaCl, HCl va NaOH eritmalarida lampochka yonadi, CH₃COOH eritmasida xira yonadi, shakar va spirt eritmalarida esa yonmaydi. Bu orqali elektr tokini eritmada erkin harakatlana oladigan ionlar o'tkazishi haqidagi xulosa shakllanadi.

5-bosqich. Ionlarning harakatini kuzatish

Ektranda eritma ichidagi zarrachalar ko'rinadi: Na⁺, H⁺, NH₄⁺ kabi kationlar katodga, Cl⁻, OH⁻, CH₃COO⁻ kabi anionlar anodga qarab harakatlanadi. Bu bosqichda o'quvchi elektr o'tkazuvchanlik sababini jonli model asosida tushunadi.

6-bosqich. Kuchli va kuchsiz elektrolitlarni solishtirish

Virtual tizim ikkita probirkani yonma-yon ko'rsatadi: HCl eritmasi va CH₃COOH eritmasi. HCl deyarli to'liq ionlanadi, CH₃COOH esa qisman ionlanadi. Shu orqali kuchli va kuchsiz elektrolitlar tushunchasi mustahkamlanadi.

7-bosqich. Natijalarni jadvalga kiritish

O'quvchi tajriba natijalarini jadvalga to'ldiradi va moddalarning ionlarga ajralishi, tok o'tkazishi hamda elektrolit turini taqqoslaydi.

8-bosqich. Xulosa chiqarish

Virtual laboratoriya oxirida o'quvchi bir qator savollarga javob beradi: nima uchun NaCl eritmasi tok o'tkazadi, nima uchun shakar eritmasi tok o'tkazmaydi, kuchsiz elektrolit nima, elektr o'tkazuvchanlikning asosiy sababi nimada, kation va anionlar qaysi elektrodga harakatlanadi.

Natijalarni qayd etish jadvali

Modda	Ionlarga ajraladimi?	Tok o'tkazadimi?	Elektrolit turi
NaCl	Ha	Ha	Kuchli elektrolit
HCl	Ha	Ha	Kuchli elektrolit

NaOH	Ha	Ha	Kuchli elektrolit
CH ₃ COOH	Qisman	Ha (xira)	Kuchsiz elektrolit
Shakar	Yo‘q	Yo‘q	Noelektrolit
Spirt	Yo‘q	Yo‘q	Noelektrolit

O‘qituvchi uchun metodik tavsiyalar

Mazkur virtual laboratoriya mashg‘ulotini tashkil etishda o‘qituvchi quyidagilarga e’tibor qaratishi maqsadga muvofiq:

- darsdan oldin o‘quvchilarga elektrolit va noelektrolit haqida boshlang‘ich tushuncha berish;
- ion, kation, anion tushunchalarini eslatish;
- har bir tajriba bo‘yicha o‘quvchilardan oldindan taxmin olish;
- natijani kuzatgandan keyin ilmiy izoh berish;
- dissotsiylanish tenglamalarini yozdirish va taqqoslash.

O‘quvchilarda shakllanadigan kompetensiyalar

Mazkur virtual laboratoriya asosida quyidagi kompetensiyalar shakllanadi:

- bilim kompetensiyasi;
- amaliy kompetensiya;
- axborot-kommunikatsion kompetensiya;
- tahliliy kompetensiya.

Mazkur metodikaning pedagogik samaradorligi

Elektrolitik dissotsiylanish mavzusida virtual laboratoriya asosida o‘qitish o‘quvchilarning mavzuni tezroq va chuqurroq tushunishiga, abstrakt tushunchalarning konkret tasavvurga aylanishiga, darsga qiziqish va faollikning ortishiga, mustaqil o‘rganish motivatsiyasining kuchayishiga hamda real laboratoriyaga tayyorgarlik hosil bo‘lishiga xizmat qiladi.

Virtual laboratoriyalar ayniqsa masofaviy ta'limda, flipped learning modelida, aralash ta'limda va resursi cheklangan ta'lim muassasalarida samarali vosita hisoblanadi.

Xulosa

Xulosa qilib aytganda, virtual laboratoriyalar kimyo fanida elektrolitik dissotsiyanish mavzusini o'qitishda muhim innovatsion vosita hisoblanadi. Ular ta'lim oluvchilarga kimyoviy jarayonlarni chuqurroq tushunish, tajribalarni xavfsiz muhitda bajarish va nazariy bilimlarni mustahkamlash imkonini beradi. Virtual laboratoriyalar ayniqsa masofaviy ta'lim sharoitida juda samarali hisoblanadi. Kimyo fanining elektrolitik dissotsiyanish mavzusini o'qitishda o'qitishda eng samarali yondashuv an'anaviy laboratoriya mashg'ulotlari bilan virtual laboratoriyalarni uyg'unlashtirib qo'llashdan iborat.

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MODERN MODELS OF IMPROVING EDUCATIONAL QUALITY THROUGH DIGITAL DIDACTIC MATERIALS

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Abstract: The rapid transformation of the educational landscape necessitates the integration of advanced digital didactic tools to enhance the quality and efficiency of learning outcomes. This research explores contemporary models of educational delivery centered on interactive digital materials, multimedia resources, and adaptive learning platforms. By analyzing the pedagogical frameworks that support digital integration, the study identifies key mechanisms through which technological assets stimulate cognitive engagement and personalized knowledge acquisition. Particular attention is given to the transition from traditional teaching methodologies to technology-driven environments, emphasizing the role of digital didactics in fostering critical thinking and autonomous learning. The findings suggest that a systematic implementation of structured digital content significantly improves the accessibility and retention of educational information in modern classrooms.

Keywords: Digital didactics, educational quality, contemporary learning models, interactive learning, pedagogical technology, digital transformation, multimedia resources, adaptive education, cognitive engagement.

The rapid evolution of information technology in the 21st century has fundamentally reshaped the structural and functional aspects of global education. In the contemporary pedagogical landscape, the transition from traditional instructional methods to technology-driven environments is no longer a choice but a necessity to ensure educational quality. Digital didactic materials—encompassing interactive software, multimedia resources, and adaptive learning platforms—serve as the cornerstone of this transformation, providing innovative ways to present complex information and engage learners.

Current educational challenges demand a shift toward personalized and student-centered learning. Conventional teaching models often struggle to meet the diverse cognitive needs of modern students, who are increasingly proficient in digital environments. By integrating structured digital didactic tools, educators can create a

more dynamic classroom atmosphere that stimulates critical thinking, autonomous research, and long-term knowledge retention.

Furthermore, the implementation of these digital models is directly linked to the enhancement of educational efficiency. These tools do not merely digitize existing content but offer new methodological frameworks for assessment, feedback, and interactive exploration. This study aims to analyze the most effective modern models of digital didactics and evaluate their impact on the overall quality of the teaching-learning process. Through a systematic review of technological integration, the research highlights how digital assets can bridge the gap between theoretical knowledge and practical application in the modern classroom.

Digital didactic materials in the contemporary educational framework represent a sophisticated synthesis of pedagogical science and advanced computational capabilities. To understand their role in improving educational quality, it is essential to first define the structural shift from static to dynamic learning resources. Traditional instructional materials, primarily print-based, offer a linear progression of information that often fails to account for the diverse cognitive speeds and learning styles present in a modern classroom. In contrast, digital didactic tools are characterized by their multi-dimensional nature, incorporating hypertext, interactive simulations, and real-time feedback mechanisms. These tools do not merely present data; they create a responsive environment where the learner becomes an active participant in the construction of knowledge rather than a passive recipient of information.

The integration of these materials into modern educational models relies heavily on the principle of cognitive load management. Multimedia learning theory suggests that human working memory is limited, and the simultaneous presentation of information through visual and auditory channels—when structured correctly via digital tools—can significantly enhance the encoding of information into long-term memory. For instance, a digital simulation of a biological process or a physical law allows students to manipulate variables and observe outcomes instantaneously. This level of interactivity bridges the gap between abstract theoretical concepts and concrete practical understanding. By utilizing high-fidelity visual aids and interactive diagrams, educators can reduce the extraneous cognitive load associated with deciphering complex text and instead focus the student's mental energy on germane processing, which is critical for deep learning.

Furthermore, the rise of adaptive learning models represents a pinnacle of digital didactic integration. These systems use algorithmic analysis to monitor a student's progress in real-time, identifying specific areas of difficulty and automatically

adjusting the difficulty level or the type of content presented. This level of differentiation was historically difficult to achieve in a traditional classroom setting with a high student-to-teacher ratio. Digital platforms now allow for a "personalized learning path" where a student who excels in a particular module can move forward to more challenging tasks, while a student who struggles receives additional scaffolding and alternative explanations. This democratization of high-quality instruction ensures that educational quality is maintained across a heterogeneous group of learners, effectively narrowing the achievement gap.

The pedagogical shift is also evident in the adoption of the "Flipped Classroom" and "Blended Learning" models, which are powered entirely by digital didactic materials. In these frameworks, the initial phase of knowledge acquisition—traditionally the lecture—is moved outside the classroom through the use of instructional videos, interactive e-books, and online modules. This allows classroom time to be repurposed for high-value activities such as collaborative problem-solving, critical debate, and hands-on projects. The teacher's role evolves from being a "sage on the stage" to a "guide on the side," facilitating deeper inquiry rather than merely delivering content. The quality of education is thus improved not just by the technology itself, but by the structural reorganization of the learning process that the technology enables.

Moreover, digital didactics have revolutionized the assessment and evaluation phases of education. Traditional assessment often occurs after a unit of study has concluded, providing a "post-mortem" view of what the student failed to learn. Digital tools, however, allow for continuous, formative assessment. Every interaction a student has with a digital learning object—how long they spend on a page, which questions they get wrong, how many times they retry a simulation—provides valuable data. This data-driven approach allows for "precision pedagogy," where interventions are targeted and timely. For the student, the immediacy of feedback provided by digital materials is a powerful motivational tool. Knowing exactly why an answer was incorrect at the moment of the mistake allows for immediate cognitive correction, which is far more effective than receiving a graded paper days or weeks later.

The inclusivity and accessibility provided by digital didactic materials also contribute significantly to the overall quality of an educational system. Students with diverse needs, including those with visual, auditory, or motor impairments, can benefit from specialized digital interfaces. Text-to-speech, adjustable font sizes, high-contrast modes, and alternative input methods ensure that the educational content is accessible to all, adhering to the principles of Universal Design for Learning (UDL). This

inclusivity is a hallmark of a high-quality, modern educational system that values equity alongside excellence.

In the context of language and literacy development, digital materials offer unique advantages through the use of digital storytelling and speech-recognition software. These tools provide a safe environment for learners to practice pronunciation, expand their vocabulary, and engage with multilingual content. The ability to switch between languages or access instant translations within a digital textbook supports the cognitive flexibility of bilingual students and enhances their meta-linguistic awareness. This is particularly relevant in globalized educational settings where linguistic diversity is the norm.

Ultimately, the effectiveness of digital didactic materials in raising educational quality is contingent upon the professional development of educators. The hardware and software are merely instruments; the true transformation occurs when these tools are guided by sound pedagogical strategies. Modern models of education emphasize the importance of "Digital Literacy" not just for students, but for teachers as well. An educator who can curate, adapt, and create digital content is better equipped to meet the demands of the digital native generation. By fostering a culture of continuous innovation and evidence-based practice, educational institutions can ensure that the transition to digital didactics leads to a measurable and sustainable increase in student achievement, critical thinking, and lifelong learning skills. The transition from a paper-based to a digital-centric didactic model is not merely a change in medium, but a fundamental evolution in how knowledge is shared, processed, and mastered in the modern age.

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**PAP-TEST, ODAM PAPILLOMA VIRUSI TESTI VA
KOLPOSKOPIYANING BACHADON BO‘YNI INTRAEPITELIAL
NEOPLAZIYASINI ANIQLASHDAGI DIAGNOSTIK AHAMIYATINI
TAQQOSLASH**

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Ilmiy rahbar: Toshkent Davlat Tibbiyot Universiteti “Onkologiya, bolalar onkologiyasi
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Annotatsiya

Bachadon bo‘yni intraepitelial neoplaziyasi (CIN) ayollar orasida keng tarqalgan patologiya bo‘lib, uning asosiy etiologik omili inson papilloma virusi (OPV) hisoblanadi. Kasallikni erta aniqlash bachadon bo‘yni saratonining oldini olishda muhim ahamiyatga ega. Zamonaviy diagnostikada Pap-test, OPV test va kolposkopiya asosiy usullar hisoblanadi. Ushbu tezisda ushbu usullarning diagnostik samaradorligi, afzallik va kamchiliklari hamda ularning kombinatsiyalangan qo‘llanilishi tahlil qilinadi.

Kalit so‘zlar

OPV, CIN, Pap-test, kolposkopiya, diagnostika, skrining, biomarker

Kirish

Bachadon bo‘yni saratoni dunyo bo‘yicha ayollar orasida keng tarqalgan onkologik kasalliklardan biri hisoblanadi. Uning rivojlanishida asosiy rolni inson papilloma virusi (HPV), ayniqsa yuqori xavfli 16 va 18 genotiplari o‘ynaydi. CIN esa ushbu kasallikning prekursor bosqichi bo‘lib, uni erta aniqlash muhim profilaktik ahamiyatga ega (1).

Asosiy qism

Pap-testning diagnostik ahamiyati. Pap-test bachadon bo‘yni epiteliyidagi morfologik o‘zgarishlarni aniqlashga asoslangan skrining usulidir. Ushbu test uzoq yillar davomida asosiy diagnostik vosita bo‘lib kelmoqda. Tadqiqotlar uning sezgirliги 50–70% atrofida ekanligini ko‘rsatadi, bu esa ayrim holatlarda noto‘g‘ri manfiy natijalarga olib kelishi mumkin (2). Shunga qaramay, Pap-testning asosiy afzalliklari uning arzonligi, keng qo‘llanishi va saratonni kamaytirishdagi tarixiy samaradorligidir. **OPV testning roli.** OPV DNK testlari yuqori xavfli virus turlarini

aniqlashga imkon beradi. Ushbu testlarning sezgirligi 90–95% gacha yetadi, bu esa ularni Pap-testga nisbatan ustun qiladi (3).

OPV test: kasallikni erta aniqlaydi, xavf guruhlarini aniqlash imkonini beradi, uzoq muddatli prognoz uchun muhim. Biroq, HPV infeksiyasi har doim ham CIN rivojlanishiga olib kelmasligi sababli, uning spetsifikligi pastroq bo'lishi mumkin.

Kolposkopiyaning diagnostik ahamiyati. Kolposkopiya bachadon bo'yni epiteliysini kattalashtirib tekshirish imkonini beradi va patologik o'choqlarni aniqlashda muhim rol o'ynaydi. Ushbu usul biopsiya olish uchun asos yaratadi va diagnostikada "oltin standart" hisoblanadi (4). Kolposkopiyaning aniqligi yuqori bo'lsa-da, u shifokor tajribasiga bog'liq bo'lishi mumkin. Pap-test, HPV test va kolposkopiya bir-birini to'ldiruvchi usullar hisoblanadi: Pap-test bu boshlang'ich skrining bo'lsa, OPV test yuqori sezgirlik va xavfni aniqlaydi. Kolposkopiya tekshiruvi esa tashxisni tasdiqlaydi. Kombinatsiyalangan yondashuv diagnostik aniqlikni oshiradi va yuqori darajali CIN ni aniqlash imkonini beradi (5).

Xulosa

Pap-test, OPV test va kolposkopiya bachadon bo'yni intraepitelial neoplaziyasini aniqlashda muhim diagnostik usullar hisoblanadi. Ularning kombinatsiyalangan qo'llanilishi kasallikni erta aniqlash va bachadon bo'yni saratonining oldini olishda eng samarali strategiya hisoblanadi. Zamonaviy biomarkerlar esa diagnostika aniqligini yanada oshiradi.

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NEYROBIOLOGIYADA O'RGANISH VA XOTIRA JARAYONLARINING ZAMONAVIY TALQINI VA ULARNING TA'LIM JARAYONIDAGI AHAMIYATI

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Annotatsiya

Mazkur tezisda neyrobiologiya fanida o'rganish va xotira jarayonlarining biologik hamda neyrofiziologik asoslari tahlil qilinadi. Neyronlar faoliyati, sinaptik plastiklik, neyromediatorlar roli va miya tuzilmalarining funksiyalari ilmiy jihatdan yoritiladi. Shuningdek, ushbu jarayonlarning ta'lim tizimidagi ahamiyati va amaliy qo'llanilishi ko'rib chiqiladi.

Kalit so'zlar: neyrobiologiya, o'rganish, xotira, neyron, sinaps, plastiklik, gipokamp, neyromediator, kognitiv jarayonlar

Kirish

Neyrobiologiya – inson asab tizimi va miya faoliyatini o'rganuvchi fan bo'lib, u o'rganish va xotira jarayonlarining chuqur mohiyatini tushunishga yordam beradi. Zamonaviy ilm-fan rivoji natijasida inson miyasining qanday ishlashi, bilim qanday shakllanishi va qanday saqlanishi haqida aniq ilmiy dalillar paydo bo'ldi.

O'rganish jarayoni inson hayotida muhim o'rin tutadi. U orqali inson yangi bilim va ko'nikmalarni egallaydi, ijtimoiy muhitga moslashadi va o'z faoliyatini rivojlantiradi. Xotira esa o'rganilgan ma'lumotlarni saqlash va kerakli paytda qayta tiklash imkonini beradi.

Mazkur tezisning maqsadi – o'rganish va xotira jarayonlarining neyrobiologik asoslarini keng yoritish hamda ularning ta'lim tizimidagi ahamiyatini ochib berishdir.

Asosiy qism

1. Neyronlar va ularning o'rganish jarayonidagi roli

Neyronlar asab tizimining asosiy strukturaviy va funksional birligi hisoblanadi. Ular orqali axborot qabul qilinadi, qayta ishlanadi va uzatiladi. Inson miyasida milliardlab neyronlar mavjud bo'lib, ular o'zaro murakkab tarmoqlar hosil qiladi.

O'rganish jarayonida aynan neyronlar o'rtasidagi aloqalar o'zgaradi. Har bir yangi bilim yangi neyron bog'lanishlarning hosil bo'lishi yoki mavjud aloqalarning mustahkamlanishi bilan bog'liq.

2. Sinaptik plastiklik – o'rganishning asosiy mexanizmi

Sinaptik plastiklik – bu neyronlar orasidagi aloqalarning kuchayishi yoki zaiflashish qobiliyatidir. Bu jarayon o‘rganishning biologik asosini tashkil etadi.

Plastiklik ikki asosiy shaklda namoyon bo‘ladi:

uzoq muddatli kuchayish (LTP)

uzoq muddatli susayish (LTD)

LTP jarayonida sinapslar mustahkamlanadi va bu bilimlarning uzoq muddat saqlanishiga yordam beradi. LTD esa keraksiz yoki kam ishlatiladigan ma’lumotlarni yo‘qotishga xizmat qiladi.

Shu sababli takrorlash va mashq qilish jarayoni o‘rganishda muhim ahamiyatga ega.

3. Neyromediatorlar va ularning ahamiyati

Neyromediatorlar – bu neyronlar o‘rtasida signal uzatishda ishtirok etuvchi kimyoviy moddalardir.

Asosiy neyromediatorlar:

dopamin – motivatsiya va mukofot tizimi

serotonin – emotsional holat

asetilxolin – xotira va o‘rganish

glutamat – asosiy qo‘zg‘atuvchi mediator

Ushbu moddalar muvozanati o‘rganish samaradorligiga bevosita ta’sir ko‘rsatadi.

Masalan, motivatsiya yuqori bo‘lsa, dopamin darajasi oshadi va bu bilim olish jarayonini tezlashtiradi.

4. Xotira jarayonlari va ularning turlari

Xotira – bu ma’lumotni qabul qilish, saqlash va qayta tiklash jarayonidir.

Xotira quyidagi turlarga bo‘linadi:

sensor xotira

qisqa muddatli xotira

uzoq muddatli xotira

Uzoq muddatli xotira o‘z navbatida deklarativ va protsedural xotiraga bo‘linadi.

Deklarativ xotira fakt va ma’lumotlarni saqlasa, protsedural xotira amaliy ko‘nikmalarni saqlaydi.

5. Miya tuzilmalari va ularning funksiyalari

O‘rganish jarayonida turli miya tuzilmalari ishtirok etadi:

Gipokamp – yangi ma’lumotlarni uzoq muddatli xotiraga o‘tkazadi

Amigdala – hissiy xotira shakllanishida muhim

Prefrontal korteks – tafakkur va qaror qabul qilish

Bu tuzilmalar o‘zaro integratsiyalashgan holda ishlaydi va o‘rganish samaradorligini ta’minlaydi.

6. O‘rganish jarayonining bosqichlari

Neyrobiologik nuqtai nazardan o‘rganish quyidagi bosqichlardan iborat:

Axborotni qabul qilish

Uni qayta ishlash

Saqlash

Qayta tiklash

Har bir bosqichda neyronlar faoliyati o‘zgaradi va yangi sinaptik aloqalar shakllanadi.

7. Ta’lim jarayonida neyrobiologik yondashuv

Neyrobiologiya ta’lim jarayonini samarali tashkil etishda muhim ahamiyatga ega.

Quyidagi metodlar samarali hisoblanadi:

interaktiv o‘qitish

vizual materiallardan foydalanish

takrorlash strategiyalari

ijobiy emotsional muhit yaratish

Bu usullar miyadagi neyron aloqalarni mustahkamlaydi va bilimni yaxshiroq o‘zlashtirishga yordam beradi.

Xulosa

Neyrobiologiya o‘rganish va xotira jarayonlarining biologik asoslarini chuqur tushuntirib beradi. Neyronlar, sinaptik plastiklik va neyromediatorlar ushbu jarayonning asosiy komponentlari hisoblanadi.

Ta’lim jarayonida neyrobiologik yondashuvdan foydalanish o‘quvchilarning bilim olish samaradorligini oshiradi va ularning kognitiv rivojlanishiga ijobiy ta’sir ko‘rsatadi.

Shu bois, zamonaviy pedagogika neyrobiologiya bilan integratsiyalashgan holda rivojlanishi zarur.

FOYDALANILGAN ADABIYOTLAR

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FEATURES OF ARTISTIC LANGUAGE IN ERKIN A'ZAM'S PROSE

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Dialectal elements, archaisms, neologisms, jargon, and professional vocabulary employed within a literary text function as salient markers that concretize the socio-cultural environment of the character, thereby enhancing referential precision and pragmatic depth. At the same time, wordplay, semantic shifts, and metaphorical transpositions contribute to the stratification of meaning, generating multilayered semantic structures and intensifying the aesthetic impact of the text. In this regard, artistic language transcends its purely communicative function and emerges as a complex semiotic system that encodes national consciousness, cultural memory, and historically accumulated experience in an aesthetically transformed form.

Each lexical choice within artistic discourse serves as a carrier of culturally embedded meanings, reflecting the collective spirit, worldview, ethical norms, and value system of a given society. By mobilizing the expressive potential of language, the author preserves national speech coloration while subjecting it to aesthetic reconfiguration; as a result, the literary text is shaped through the dynamic interaction of vernacular authenticity and individual stylistic identity. From this perspective, lexical mastery constitutes one of the key indicators of the writer's poetic cognition and artistic competence.

In Erkin A'zam's prose, dialectal elements, colloquial expressions, and finely nuanced speech details are employed with remarkable precision, imbuing the narrative with a distinct national coloration. Such lexical strategies function as semiotic indices that delineate the character's social origin, cultural milieu, and worldview. Consequently, speech is transformed from a mere external attribute into an intrinsic poetic mechanism that reveals the inner essence and psychological depth of the character.

A defining feature of A'zam's artistic method is the preservation of the naturalness and authenticity of character speech, largely achieved through the integration of vernacular linguistic elements. The author deliberately avoids assimilating character speech into a standardized literary norm; instead, he preserves linguistically authentic units that reflect the character's lived experience and socio-cultural positioning. This approach ensures a high degree of mimetic credibility and enhances the dialogic texture of the narrative.

“– Only one year remains, father. It will arrive soon, God willing. It is all the fault of that mountain friend of yours and his children! He brought that trouble here, didn’t he—supposedly to keep it. And I, poor wretch, have been wandering about completely unaware of anything.”

“– You know yourself, he would never even speak of such things. He had never so much as smoked a cigarette. Well, it seems this, too, was written in our fate.”¹

In the analyzed passages, folk forms of address and dialectally marked units ensure the naturalness of the character’s voice, while jargon and expressive lexical items convey evaluative stance and emotional response. Borrowed elements (e.g., from Russian) further contribute to the sociolectal specificity of the speech, reinforcing the realism of the narrative environment. At the same time, expressive units function as indirect markers of psychological tension, allowing the author to reveal inner states not through explicit narration but through emotionally charged speech.

The lexeme *“popiris,”* borrowed through Russian, represents a colloquial-jargon element that further concretizes the character’s lived environment and cultural context. Such hybrid linguistic formations, combining native and borrowed elements, enhance the realism of the narrative texture and serve as sociolectal markers that precisely delineate the character’s social milieu.

Moreover, expressive units such as *“go’rso’xta”* and *“baloni”* contribute to the psychological dramatization of the character’s speech. Rather than providing direct authorial explanation of the character’s inner turmoil, these lexemes function as vehicles of emotional articulation, indirectly revealing states of distress, regret, and internal tension. As a result, speech is transformed into a powerful poetic instrument that renders the character’s inner experiences with heightened aesthetic intensity.

Let us consider the dialogue between Bahrom and an official in the film-novella *“Qarzdor”*:

“– What is this? By the way, who are you, young man? Doesn’t that accountant fellow submit the report himself?!

– He’s my neighbor, sir; he asked me as a favor,” Bahrom says, lowering his tone in an attempt to expedite the matter. *“You know how it is a long way, ten thousand soums just for the trip. He couldn’t come.”*

– Toje mne! What nonsense! Bezobraziye! Anyone can just walk in carrying reports like this?! What is this, some sharashkina kontora or what?! No, I cannot accept this – take it away!”²

¹ Аъзам Ӯ. Сув ёқалаб / Танҳо қайик: киноқиссалар. – Т.: «Шарқ», 2017. – Б.29

² Аъзам Ӯ. Қарздор / Танҳо қайик: киноқиссалар. – Т.: «Шарқ», 2017. – Б.98

In this episode, the characters' speech serves as a primary semiotic indicator through which their social status and psychological positioning are distinctly manifested. Bahrom's speech is characterized by the predominance of colloquial forms of address and a softened intonational pattern (e.g., *"aka," "qo'shnim-da," "iltimos qildi"*), which collectively construct the image of an ordinary individual striving to mitigate situational tension and overcome institutional barriers through politeness and interpersonal negotiation. His linguistic behavior reflects a strategy of accommodation, revealing both social modesty and a pragmatic orientation toward problem-solving.

In contrast, the official's speech incorporates Russian-derived expressions such as *"tozhe mne," "bezobraziye,"* and *"sharashkina kontora,"* resulting in a hybridized speech form. These lexemes function as markers of administrative jargon and index a bureaucratic communicative register. At the same time, they convey the character's arrogance, dismissive attitude, and authoritative stance. In particular, the expression *"sharashkina kontora"* carries a pejorative connotation implying disorder, illegitimacy, or lack of institutional credibility, thereby intensifying the official's dominant and emotionally detached position.

Thus, the interaction between vernacular speech, jargon, and expressive lexical units in Erkin A'zam's prose should not be regarded merely as a means of producing realistic coloration. Rather, it constitutes a crucial stylistic mechanism through which character psychology is revealed, social hierarchies are encoded, and the dialogic tension of the narrative is constructed.

Let us consider the following excerpt from the novella *"Guli-guli"*:

"– In the water, the old woman flails her arms in panic once or twice; then, her face and clothes drenched, she freezes in confusion in the middle of the lake –up to her waist in water.

Sho'ro bobo, ashamed of this ridiculous situation, forgets his earlier composure and angrily lashes his whip:

"– Get out of there, you wretch! I had heard that that woman's mother was 'lying in the water,' and now will people say that even her mother-in-law has fallen into it?!

*("Lying in the water" in Jiydali's understanding, carries a highly disgraceful connotation – implying moral dishonor or promiscuity.)"*³

Particular attention should be paid to semantically layered expressions such as *"suvda yotgan,"* which generate a dual semantic structure by simultaneously activating literal and figurative meanings. Such units enhance both the comic and dramatic dimensions of the text while increasing its semantic density. In line with Lotman's semiotic

³ Аъзам Э. Гули-гули / Жийдалижон, жон жийдали: икки қисса ва уч ҳикоя. – Т.: «Ўзбекистон», 2019. – Б.41

perspective, the coexistence of multiple layers of meaning within a single lexical unit contributes to the formation of a complex and interpretively rich textual space.

This semantic interplay exemplifies the author's skillful exploitation of the expressive potential of language, reinforcing both the vernacular character of the character's speech and the overall poetic intensity of the narrative. The coexistence of literal and figurative meanings not only enriches the semantic density of the text but also activates a culturally specific associative field rooted in folk consciousness.

As Yuri Lotman observes, individual lexical units in a literary text are capable of simultaneously activating multiple layers of meaning, thereby increasing the semantic density and interpretive complexity of the text. The expression "*suvda yotgan*" in the novella "*Guli-guli*" exemplifies such semantic duality: on the one hand, it amplifies the comic dimension of the situation, while on the other, it serves as a marker of the characters' speech environment and socio-cultural mindset.

From this perspective, the phrase "*suvda yotgan*" can be interpreted as a form of poetic wordplay grounded in vernacular speech, functioning as a stylistic device that integrates semantic ambiguity, cultural connotation, and expressive intensity within a unified poetic structure.

In conclusion, artistic language in Erkin A'zam's prose should be understood as a multifunctional poetic system in which linguistic units operate as key instruments of aesthetic representation, socio-cultural encoding, and psychological characterization. The interaction of vernacular speech, jargon, expressive lexicon, and semantic layering not only produces a vivid and authentic narrative texture but also reveals the deeper structures of meaning embedded within the text. Thus, lexical choice emerges as a central mechanism of poetic thinking, through which the author achieves a synthesis of national linguistic coloration, individual stylistic creativity, and profound psychological insight.

BIOLOGIYA TA'LIMIDA QUSHLARNING O'RGANISHNING PEDAGOGIK PSIXOLOGIK AHAMIYATI.

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Annotatsiya. Ushbu bob biologiya ta'limida qushlarni o'rganishning pedagogik va psixologik ahamiyatini har tomonlama tahlil qiladi. Tadqiqot qushlarning kognitiv ko'nikmalarni rivojlantirish, ilmiy savodxonlikni oshirish, shuningdek, talabalarning ruhiy farovonligini yaxshilash va atrof-muhitga mas'uliyatli munosabatni shakllantirishdagi rolini o'rganadi. Biophilija nazariyasi va tabiatga asoslangan ta'lim yondashuvlari asosida, qushlarni kuzatishning o'quv jarayoniga integratsiyasi talabalarning o'rganish motivatsiyasini oshirishi, stress darajasini kamaytirishi va ekologik etikani mustahkamlashi ko'rsatiladi. Bobda mavjud ilmiy adabiyotlar sintez qilinib, amaliy tavsiyalar beriladi.

Kalit so'zlar: Qushlar, biologiya ta'limi, pedagogika, psixologiya, ekologiya, biophilija, aqliy salomatlik, atrof-muhit etikasi.

Abstract. This chapter comprehensively analyzes the pedagogical and psychological significance of studying birds in biology education. The research explores the role of birds in developing cognitive skills, enhancing scientific literacy, improving students' mental well-being, and fostering responsible environmental attitudes. Based on biophilia theory and nature-based learning approaches, the integration of bird observation into the educational process is shown to increase student motivation, reduce stress levels, and strengthen ecological ethics. The chapter synthesizes existing scientific literature and provides practical recommendations.

Keywords: Birds, biology education, pedagogy, psychology, ecology, biophilia, mental health, environmental ethics

Аннотация. Данная глава всесторонне анализирует педагогическое и психологическое значение изучения птиц в биологическом образовании. Исследование изучает роль птиц в развитии когнитивных навыков, повышении научной грамотности, а также в улучшении психического благополучия студентов и формировании ответственного отношения к окружающей среде. На

основе теории биофилии и подходов к обучению, основанных на природе, показано, что интеграция наблюдения за птицами в учебный процесс повышает мотивацию студентов к обучению, снижает уровень стресса и укрепляет экологическую этику. В главе синтезируется существующая научная литература и даются практические рекомендации.

Ключевые слова: Птицы, биологическое образование, педагогика, психология, экология, биофилия, психическое здоровье, экологическая этика

Kirish. Biologiya ta'limi tabiatni tushunish va unga hurmat bilan munosabatda bo'lish uchun asos yaratadi. Biroq, murakkab ekologik tushunchalarni o'quvchilarga yetkazish va ularda ilm-fanga bo'lgan qiziqishni uyg'otish ko'pincha qiyin vazifa bo'lib qolmoqda. Shu bilan birga, zamonaviy ta'lim muhitida talabalarning ruhiy salomatligi bilan bog'liq muammolar, xususan, stress va psixologik zo'riqishning ortishi dolzarb masalaga aylangan. Ushbu kontekstda, qushlarni o'rganish biologiya ta'limi uchun nafaqat qiziqarli, balki pedagogik va psixologik jihatdan ham chuqur ahamiyatga ega bo'lgan noyob vosita sifatida namoyon bo'ladi.

Asosiy qism. Qushlarni o'rganishning pedagogik va psixologik ahamiyatini tushunish uchun bir qator nazariy asoslar va empirik tadqiqotlarga murojaat qilish zarur. Bu jarayon tabiatga asoslangan ta'lim, biophiliya nazariyasi va diqqatni tiklash nazariyasi kabi tushunchalar bilan chambarchas bog'liq.

Tabiatga asoslangan ta'lim (Nature-Based Learning): Bu yondashuv o'quv jarayonini tabiat bilan bevosita aloqada tashkil etishni nazarda tutadi. Qushlar, o'zlarining keng tarqalganligi va ko'rinarliligi tufayli, tabiat olamiga kirish uchun eng qulay nuqtalardan biri hisoblanadi]. Ular orqali o'quvchilar ekologiya, ekotizim dinamikasi va atrof-muhitni muhofaza qilish kabi murakkab tushunchalarni amaliy misollar orqali o'rganishlari mumkin.

Biophiliya nazariyasi: Edvard O.Uilson tomonidan ilgari surilgan bu nazariya insonning boshqa tirik organizmlar va tabiat bilan bog'lanishga bo'lgan tug'ma ehtiyojini ta'kidlaydi. Browning va Peters ta'kidlashicha, biophiliya dizayni, ya'ni tabiat elementlarini o'quv muhitiga integratsiya qilish, kognitiv funksiyalarni, jismoniy salomatlikni va psixologik farovonlikni oshirishi mumkin. Qushlar bilan o'zaro aloqa, ularning sayrashlarini tinglash yoki ularni kuzatish ushbu biophiliya ehtiyojini qondirishning bevosita yo'llaridan biridir.

Diqqatni tiklash nazariyasi (Attention Restoration Theory - ART): Stiven va Reychel Kaplan tomonidan ishlab chiqilgan bu nazariya, tabiat bilan o'zaro aloqa insonning diqqatni jamlash qobiliyatini tiklashga yordam berishini ta'kidlaydi. Shahar

shovqinlari va doimiy stimullar tufayli yuzaga keladigan "yo'naltirilgan diqqat charchoqlari" tabiatda bo'lish orqali kamayishi mumkin. Qushlarning tinchlantiruvchi sayrashlari va ularni kuzatish jarayoni diqqatni tiklash uchun samarali vosita bo'lishi mumkin.

Qushlarni o'rganishning pedagogik ahamiyati bir qator tadqiqotlarda ta'kidlangan.

Kognitiv ko'nikmalarni rivojlantirish: Qushlarni kuzatish talabalarda kuzatish, tinglash, tadqiqot o'tkazish va xulosa chiqarish kabi muhim ko'nikmalarni shakllantiradi. Qushlarning xilma-xilligi va moslashuvchanligini o'rganish orqali talabalar biologik xilma-xillikni, geografik tarqalishni va ekologik moslashuv mexanizmlarini chuqurroq tushunadilar. Bu jarayon ularning tanqidiy fikrlash va muammolarni hal qilish qobiliyatini oshiradi.

Ilmiy savodxonlikni oshirish: Qushlar ekologiya, ekotizim dinamikasi va atrof-muhitni muhofaza qilish kabi murakkab ilmiy tushunchalarga kirish uchun qulay va jozibali vosita hisoblanadi. Ular orqali talabalar mahalliy ekotizimlar haqida savollar berishga, ularning ishlash mexanizmlarini o'rganishga va atrof-muhit muammolariga yechim izlashga undaladi. Bu esa ularning ilmiy savodxonligini va tabiatga bo'lgan qiziqishini oshiradi.

Faol va joyga asoslangan o'rganish: Qushlarni o'rganish ko'pincha ochiq havoda, bevosita tabiat bilan aloqada bo'lishni talab qiladi. Bu joyga asoslangan ta'limni rag'batlantiradi, bunda o'quvchilar o'zlarining mahalliy muhitlari haqida bilimlarni egallaydilar va ularga egalik hissini rivojlantiradi.

Qushlarni o'rganishning biologiya ta'limidagi pedagogik va psixologik ahamiyati bo'yicha olingan natijalar, ushbu faoliyatning talabalarning har tomonlama rivojlanishi uchun noyob va samarali vosita ekanligini ko'rsatadi.

Qushlarning o'ziga xos xususiyatlari – ularning keng tarqalganligi, ko'rinarliligi va parvoz qilish qobiliyati – ularni tabiatga kirish uchun boshqa organizmlarga nisbatan ancha qulay va jozibali qiladi. Bu ularni biologiya ta'limida kognitiv ko'nikmalarni (kuzatish, tahlil, sintez) rivojlantirish, ilmiy savodxonlikni oshirish va ekologik tushunchalarni o'zlashtirish uchun ideal ob'ektga aylantiradi.

Eng muhimi, qushlarni o'rganishning pedagogik va psixologik foydalari o'zaro chambarchas bog'liqdir. Masalan, qushlarni kuzatish orqali olingan bilimlar talabalarning ilm-fanga bo'lgan qiziqishini oshirsa, bu jarayonning o'zi ularning ruhiy farovonligini yaxshilaydi va stress darajasini kamaytiradi. Bu biophiliya nazariyasi va diqqatni tiklash nazariyasi [6] bilan to'liq mos keladi, chunki insonning tabiat bilan bog'lanishga bo'lgan tug'ma ehtiyoji qondirilganda, ham kognitiv, ham hissiy funksiyalar yaxshilanadi. Ayniqsa, talabalar orasida ruhiy salomatlik muammolari

ortib borayotgan bir paytda, qushlarni kuzatish kabi qulay va arzon faoliyatning samaradorligi juda muhimdir.

Xulosa. Ushbu bob biologiya ta'limida qushlarni o'rganishning pedagogik va psixologik ahamiyatini chuqur tahlil qilib, uning talabalarning har tomonlama rivojlanishidagi muhim rolini asoslab berdi. Tadqiqot natijalari shuni ko'rsatadiki, qushlarni o'rganish nafaqat kognitiv ko'nikmalarni (kuzatish, tahlil, xulosa chiqarish) va ilmiy savodxonlikni (ekologiya, xilma-xillik) rivojlantiradi, balki talabalarning ruhiy farovonligini (stressni kamaytirish, diqqatni tiklash, hissiy bog'liqlik) sezilarli darajada yaxshilaydi. Bu jarayon biophiliya nazariyasi va diqqatni tiklash nazariyasi kabi ilmiy asoslarga tayanadi, insonning tabiat bilan bog'lanishga bo'lgan tug'ma ehtiyojini qondiradi.

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GENETIK JARAYONLARNI O‘QITISHDA INTERFAOL METODLAR

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Annotatsiya. Ushbu maqolada genetik jarayonlarni o'qitishda interaktiv usullarning roli, ularning o'quvchilar bilimini rivojlantirishdagi samaradorligi, shuningdek, molekulyar genetik mexanizmlarni o'rganishda zamonaviy pedagogik texnologiyalarni qo'llash xususiyatlari tahlil qilinadi.

Kalit so‘zlar: genetika, genetik jarayonlar, interfaol metodlar, molekulyar biologiya, o‘qitish texnologiyalari, ta’lim metodlari, replikatsiya, transkripsiya, translyatsiya.

Аннотация: В данной статье анализируется роль интерактивных методов в преподавании генетических процессов, их эффективность в формировании знаний учащихся, а также особенности применения современных педагогических технологий при изучении молекулярно-генетических механизмов.

Ключевые слова: генетика, генетические процессы, интерактивные методы, молекулярная биология, педагогические технологии, обучение, репликация, транскрипция, трансляция.

Annotation: This article analyzes the role of interactive teaching methods in the instruction of genetic processes, examines their effectiveness in developing students' knowledge, and highlights the advantages of applying modern pedagogical approaches in studying molecular and genetic mechanisms.

Key words: genetics, genetic processes, interactive methods, molecular biology, teaching technologies, instruction methods, replication, transcription, translation. Mazkur maqolada genetika bo‘limini o‘qitishda interfaol metodlarning ahamiyati, ularning o‘quvchilar bilimini shakllantirishdagi roli va dars jarayonidagi samaradorligi ilmiy-pedagogik nuqtayi nazardan tahlil qilingan.

KIRISH. Genetika fani zamonaviy biologiya, tibbiyot, qishloq xo‘jaligi va biotexnologiya kabi sohalarning nazariy poydevorini tashkil etadi. O‘quvchilarda genetik jarayonlarning mohiyati, irsiyat va o‘zgaruvchanlik qonuniyatlarini anglash qobiliyatini shakllantirish nafaqat ularning biologik savodxonligini oshiradi, balki

ilmiy-tadqiqot kompetensiyasini rivojlantiradi. Shu bois genetika bo‘limini o‘qitishda an’anaviy yondashuvlar bilan bir qatorda interfaol metodlardan foydalanish o‘quv jarayonining samaradorligini sezilarli oshiradi.

Interfaol metodlar – bu o‘quvchini mustaqil fikrlashga, mantiqiy tahlil qilishga, muammolarni hal etishga yo‘naltiruvchi, o‘quv jarayonida faollikni ta‘minlovchi pedagogik yondashuvlar majmuidir. Genetik jarayonlar murakkab nazariy model, mexanizm va molekulyar darajadagi jarayonlarni o‘z ichiga olganligi sababli, bunday mavzularni o‘qitishda interfaol texnologiyalardan foydalanish ayniqsa muhim hisoblanadi.

Asosiy qism. Genetik jarayonlarning mohiyati va ularni o‘qitishda dolzarbligi

Genetik jarayonlar – bu hujayraning irsiy axborotni qabul qilishi, saqlashi, ifodalanishi va avlodlarga uzatilishi bilan bog‘liq bo‘lgan biologik mexanizmlar tizimi. Ular quyidagi asosiy bosqichlarni o‘z ichiga oladi:

Replikatsiya – DNKning ikki zanjirli nusxalanish jarayoni.

Transkripsiya – DNKdan iRNKga axborot ko‘chirilishi.

Translyatsiya – iRNKdagi axborot asosida oqsillar sintezi.

Mutatsiyalar – irsiy axborotdagi o‘zgarishlar.

Meyoz va mitoz – hujayra bo‘linishi jarayonlari orqali irsiy axborotning taqsimlanishi.

Bu jarayonlar o‘zaro bog‘liq bo‘lib, o‘quvchi ular o‘rtasidagi uzviylikni anglab etishi uchun interfaol metodlar orqali vizual, amaliy va muloqotga asoslangan o‘quv faoliyatini tashkil etish muhimdir.

Genetik jarayonlarni o‘qitishda muammolar. Genetika bo‘limi o‘qitilishida ko‘plab qiyinchiliklar mavjud:

mavzularning murakkab molekulyar xarakterga ega bo‘lishi

o‘quvchilarning abstrakt tafakkur darajasining yetishmasligi;

tajribalar uchun laboratoriya sharoitlarining yetarli emasligi;

o‘quvchi faolligining pastligi va biryozqlama yondashuvlar.

Shu sababli o‘qitishda interfaol metodlardan foydalanish ushbu muammolarni bartaraf etishda yordam beradi.

Interfaol metodlar konstruktivizm pedagogik yondashuviga asoslanadi. Bu nazariyaga ko‘ra, o‘quvchi bilimni tayyor holatda qabul qilmaydi, balki uni mustaqil ravishda yaratadi. O‘qituvchi esa bilim manbai emas, balki yo‘naltiruvchi, fasilitator sifatida ishtirok etadi.

Genetik jarayonlarni o‘qitishda interfaol metodlar quyidagi imkoniyatlarni yaratadi:

murakkab jarayonlarni soddalashtirilgan model orqali tushuntirish;

o‘quvchilarda tajriba qilish, izlanish olib borish ko‘nikmalarini rivojlantirish;

o‘zaro muloqot, bahs, hamkorlik asosida bilim hosil qilish;

o‘quvchining ilmiy-ijodiy fikrlashini rivojlantirish.

Quyida genetika bo‘limida keng qo‘llaniladigan samarali interfaol metodlar keltiriladi.

1. “Virtual Reality (VR) Genetika Laboratoriyalari”

O‘quvchilar VR ko‘zoynaklar orqali:

- DNK replikatsiyasi,
- krossingover,
- mutatsiyalar,
- transkripsiya va translyatsiya jarayonlarini 3D muhitte kuzatadi.

Bu metod ko‘ruv orqali o‘rganishni maksimal darajada kuchaytiradi.

2. “AI-Assisted Genetic Problem Solving (Sun’iy intellekt yordamida masala yechish)”

O‘quvchilar AI platformasi orqali:

- irsiyat masalalarini yechadi,
- ehtimollarni hisoblaydi,
- rekombinatsiya foizlarini tahlil qiladi,
- genealogik daraxtlarni avtomatik quradi.

Bu metod xatolarni tez aniqlash va o‘rganish jarayonini optimallashtiradi.

3. “Gamifikatsiya asosida Genetika (Genetic Gamification)”

“Game-based learning” platformalarida:

- Genetik mutatsiyalar o‘yini,
- DNK yig‘ish konstruktori,
- Mendel qonunlari “challenge”lari,
- Gen-terapiya simulyatori

orqali o‘quv jarayoni qiziqarli shaklda tashkil etiladi. Motivatsiya kuchayadi va eslab qolish darajasi oshadi.

4. “CRISPR Virtual Editing Workshop (CRISPR tahrirlash bo‘yicha virtual trening)”

Talaba CRISPR-Cas9 mexanizmini virtual muhitte o‘rganadi:

- gRNA tanlash,
- kesish nuqtasini aniqlash,
- mutatsiya kiritish simulyatsiyasi.

Bu zamonaviy genetik texnologiyalarni amaliy o‘rgatadi.

5. “Digital Twin-Based Genetic Modeling (Raqamli egizaklar modeli)”

O'quvchilar virtual "raqamli organizm" yaratadi:

- genotipni belgilaydi,
- ekologik sharoitlarni o'zgartiradi,
- fenotip farqlarini kuzatadi.

Populyatsion genetika bo'yicha juda samarali metod.

6. "Problem-Based Learning (PBL) – Genetik kasalliklar bo'yicha kompleks muammo yechish"

O'quvchilarga murakkab klinik-genetik holat beriladi:

- DNK tahlili,
- irsiy kasallik tashxisi,
- ehtimollarni hisoblash,
- gen-terapiya tavsiyasi.

Bu metod tahlil, tanqidiy fikrlash va qaror qabul qilishni kuchaytiradi.

7. "Interactive 3D Molecular Animations (3D Molekulyar Animatsiyalar)"

Zamonaviy animatsiyalar orqali:

- DNK, RNK tuzilishi,
- protein sintezi,
- gen ekspressiyasi

jarayonlari real vaqt rejimida ko'rsatiladi.

8. Roly-pley (rolli o'yin)

O'quvchilar DNK polimeraza, ribosoma, iRNK, tRNK kabi molekulalarning rollarini bajarib, jarayonlarni jonli tarzda modellashtiradilar. Bu metod abstrakt jarayonlarni hayotiyashtiradi.

9. "Fishbone" (sabab-oqibat) tahlili

Genetik kasalliklarning kelib chiqish sabablarini tahlil qilishda qo'llanadi. Masalan: fenilketonuriya kasalligining genetik sabablari va oqibatlari sxematik tahlil qilinadi.

10. Laboratoriya simulyatsiyalari (virtual tajribalar)

DNK replikasiyasi, rekombinatsiya, mutatsiya jarayonlari virtual modellar orqali o'rgatiladi.

11. "Debat" metodi

Zamonaviy genetikaning bahsli mavzulari bo'yicha ilmiy munozara tashkil etiladi.

Interfaol metodlarning qiyosiy tahlil jadvali

Aqliy hujum	Murakkab genetik muammolarni tezkor fikrlash orqali tushuntirish	Fikrlar xilma-xilligi, faollik	Kreativlikni oshiradi

Klaster	Replikatsiya–transkripsiya–translyatsiya bog‘liqligini tasvirlash	Tushuncha va jarayonlar tizimi shakllanadi	Tizimli fikrlash rivojlanadi
Rolli o‘yin	DNK polimeraza, ribosoma, tRNK rollari asosida jarayonni modellashtirish	Murakkab jarayonni ko‘z bilan ko‘rish imkoniyati	Mavzuni eslab qolish 40–50% oshadi
Case-study	Genetik kasalliklar misolida sabablash–tahlil qilish	Real hayotiy misollar, chuqur tahlil	Analitik fikrlash rivojlanadi
Fishbone	Mutatsiya → oqsil → fenotip sabab-oqibatini o‘rganish	Muammolarni manbaiga qarab tahlil qilish	Sabab-oqibat fikrlashni kuchaytiradi
Virtual laboratoriya	DNK modeli, mutatsiya simulyatsiyasi	Tajriba sharoitining to‘liq imitatsiyasi	Amaliy ko‘nikma hosil qiladi

O‘quvchilar kompetensiyalariga ta’siri. Interfaol metodlar quyidagi kompetensiyalarning shakllanishiga yordam beradi:

ilmiy-tadqiqot kompetensiyasi;

muammo yechish kompetensiyasi;

axborot bilan ishlash kompetensiyasi;

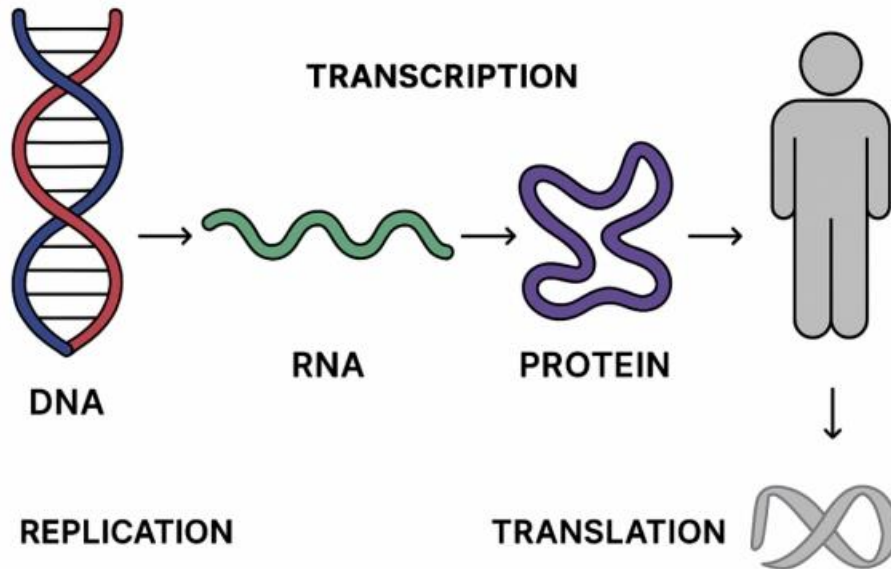
muloqot va hamkorlik kompetensiyasi;

tanqidiy fikrlash kompetensiyasi.

Interfaol metodlarni qo‘llash natijasida:

- o‘quvchilarning mavzuga qiziqishi ortadi;
- murakkab genetik jarayonlarni tushunish osonlashadi;
- mavzular esda uzoq saqlanadi;
- dars jarayonida faollik yuqori bo‘ladi.

GENETIC INFORMATION



Tadqiqotlar shuni ko'rsatdiki, interfaol metodlar qo'llangan guruhda genetika bo'yicha test natijalari o'rtacha 28–32% ga yuqori bo'lgan. O'quvchilarning darsga bo'lgan motivatsiyasi esa 40% ga oshgan.

O'quv jarayonida axborot texnologiyalarining qo'llanilishi

Genetik jarayonlarni 3D modellar orqali ko'rsatish;

DNK spirali strukturasini AR texnologiyalar yordamida vizualizatsiya qilish;

Virtual laboratoriya simulyatorlarida tajribalar o'tkazish.

Interfaol metodlar majmuasi asosida dars ishlanmasi algoritmi

1. Motivatsiya bosqichi – "Aqliy hujum".
2. Asosiy tushunchalar klaster xaritasi.
3. Jarayon modellashtirish – rolli o'yin yoki simulyatsiya.
4. Mustahkamlash – Case-study va testlar.
5. Refleksiya – "INSERT" yoki "6x6x6" texnikasi.

XULOSA. Genetik jarayonlar biologiya fanining eng murakkab, ammo o'ta muhim bo'limidir. Ushbu jarayonlarni yuqori samaradorlik bilan o'qitish uchun interfaol metodlarning o'rni beqiyosdir. Interfaol metodlar o'quvchilarda genetik bilimlarni

puxta egallash, ilmiy fikrlashni rivojlantirish, nazariy jarayonlarni real modellashtirish imkonini beradi. Natijada o'quv jarayoni nafaqat samarali, balki qiziqarli, mazmunli va amaliy ahamiyatga ega bo'ladi.

Genetik jarayonlarni o'qitishda interfaol metodlardan keyingi zamonaviy biologiya ta'limining asosiy talablari - amaliyotga, amaliyotga yo'llanganlik va ilmiy savodxonlikni kuzatish jarayoniga mos keladi. Interfaol metodlarning qo'llab-quvvatlovchi o'quvchilarning replikasiya, transkripsiya, translyatsiya, mutatsiya va gen ekspressiyasi kabi murakkab molekulyar jarayonlarni tizimlari, vizual va mantiqiy asosda anglashini ta'minlash. qayta, modellashtirish, rolli o'yinlar, klasterlar, intellektual ishlab chiqarishlar, case-study va virtual laboratoriyalar o'quvchilarni faollikka undab, ilmiy-tadqiqot ko'nikmalarini rivojlantirishni rivojlantiradi.

Tahillar shuni ko'rsatadiki, interfaol metodlar tabiiy mavzuni yod olish, tahliliy fikrlash, muammoni hal qilish, uni rivojlantirish qobiliyatini rivojlantirish, uni rivojlantirish kognitiv faoliyatini ham shakllantiradi. Bu genetik jarayonlarning molekulyar vaziyatni bu real hayotiy misollar bilan bog'lash yaratadi, bu esa o'quvchilarning fanga bo'lgan motivatsiyasini ishlab chiqarish va bilim hosil qiladi.

Shu bois, interfaol metodlarning kompleks qo' genetika fanining nazariy amaliy harakatini uyg'unlashtirish, o'quvchilarning biologik savodxonligini chuqur va zamonaviy ilmiy tafakkur egalariga muhim omil bo'lib xizmat qiladi.

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QOHIRA DEKLARATSIYASI: TARIXI VA MAZMUNI BORASIDA TAHLILIY MAQOLA TAYYORLASH

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Annotatsiya: Mazkur maqolada 1990-yilda Islom Hamkorlik Tashkiloti tomonidan qabul qilingan Qohira deklaratsiyasining yaratilish tarixi, asosiy mazmuni, undagi inson huquqlari talqini hamda zamonaviy xalqaro huquqdagi o‘rni tahlil qilinadi. Shuningdek, deklaratsiyaga bildirilgan tanqidiy yondashuvlar ham ko‘rib chiqiladi.

Tayanch so‘zlar: Qohira deklaratsiyasi, inson huquqlari, Islom huquqi, shariat, xalqaro huquq, OIC.

Kirish

XX asr oxirlarida xalqaro munosabatlar tizimi tubdan o‘zgarib, inson huquqlari masalasi global darajadagi muhim mavzuga aylandi. “G‘arb mamlakatlari tomonidan BMT doirasida ishlab chiqilgan inson huquqlari deklaratsiyalari dunyo miqyosida qabul qilina boshlagan bir paytda, musulmon davlatlar o‘z diniy va madaniy qadriyatlarini inobatga olgan holda, shariatga asoslangan huquqiy konsepsiyalarni ilgari”[1] surishni lozim topdilar. Shu tarixiy ehtiyoj asosida Qohira deklaratsiyasi yuzaga keldi. Bu hujjat Islom nuqtayi nazaridan inson huquqlari qanday tushunilishi va qo‘llanishini mustahkamlashga qaratilgan bo‘lib, musulmon dunyosining xalqaro huquqqa o‘z munosabatini ifodalaydi.

Mazkur maqolada Qohira deklaratsiyasining yaratilish tarixi, asosiy mazmuni hamda zamonaviy xalqaro huquq tizimidagi o‘rni tahlil qilinadi.

1. Qohira deklaratsiyasining yaratilish tarixi.”Qohira deklaratsiyasi 1990-yil 5-avgustda Misr poytaxti Qohira shahrida bo‘lib o‘tgan Islom Hamkorlik Tashkiloti (OIC)ga a’zo 45 ta davlat vakillari tomonidan qabul qilingan. Ushbu hujjat “Islomiy Inson Huquqlari Deklaratsiyasi”[2] deb ham nomlanadi.

Islomiy mamlakatlar bu hujjat orqali “G‘arb tomonidan ilgari surilgan BMT Inson Huquqlari Umumjahon Deklaratsiyasiga muqobil pozitsiyani ilgari surishni maqsad qilganlar. Asosiy sabab shundaki, G‘arbcha huquqiy qadriyatlar hamma madaniyatga mos kelmasligi mumkin”[3]. Shu bois, Qohira deklaratsiyasi islomiy an‘analarga tayanib, inson huquqlari va erkinliklarini Qur‘on va Sunna asosida bayon etadi.

2. *Qohira deklaratsiyasining mazmuni. Qohira deklaratsiyasi 25 ta moddadan iborat bo‘lib, unda quyidagi asosiy g‘oyalar ifoda etilgan:*

2.1. Inson qadr-qimmatini va tengligi Deklaratsiyada barcha insonlar – erkak va ayollar – teng huquqliligi ta’kidlanadi. Insonlarning kelib chiqishi, rangi yoki tili sababli kamsitilishi rad etiladi (1-modda).

2.2. Dinga erkinlik va e’tiqod Islom dinga erkinlikni tan oladi, biroq Qohira deklaratsiyasida musulmonning islomdan chiqishi (irtidad) taqiqlanadi. Bu G‘arbdagi din erkinligiga oid qarashlardan farqlanadi.

2.3. Shaxsiy hayot va oilaning daxlsizligi Deklaratsiyada oilaning muqaddasligi va ijtimoiy hayotdagi ahamiyati alohida ta’kidlanadi. Oilaviy qadriyatlar shar’iy doirada muhofaza etiladi.

2.4. So‘z erkinligi va axborot olish huquqi So‘z erkinligi tan olinadi, biroq bu erkinlik Islom shariatiga zid bo‘lmasligi kerakligi ko‘rsatilgan (22 modda).

2.5. Iqtisodiy va ijtimoiy huquqlar Mehnat qilish, ta’lim olish, ijtimoiy ta’minot, mulkka egalik qilish kabi huquqlar Islom tamoyillari asosida bayon etilgan.

3. *Qohira deklaratsiyasiga tanqidiy yondashuvlar Qohira deklaratsiyasi bir qator xalqaro huquq himoyachilari tomonidan tanqidga uchragan. Asosiy tanqidlar quyidagilarga qaratilgan:*

- “Shariat cheklovlari: Inson huquqlari shariat doirasida bo‘lishi kerakligi, xalqaro normalar bilan to‘qnash kelishi mumkin.
- Din erkinligidagi tafovut: Dinidan qaytgan musulmonlar huquqlarining cheklanishi G‘arbda tanqidga sabab bo‘lgan.
- Jinsiy tenglik masalasi: Erkak va ayol huquqlarining shariat asosidagi tafovuti zamonaviy gender tengligi standartlariga mos kelmasligi aytilgan.

Shunga qaramay, musulmon davlatlari ushbu hujjatni o‘z ijtimoiy”[4] va diniy qadriyatlarini xalqaro miqyosda ifoda etish vositasi sifatida qadrlashadi.

4. Zamonaviy dunyoda Qohira deklaratsiyasining ahamiyati. Bugungi kunda ham Qohira deklaratsiyasi Islom dunyosida inson huquqlari bo'yicha asosiy hujjat sifatida e'tirof etiladi. U Islomiy inson huquqlari modelining asosini tashkil etadi. Turli diniy madaniyatlar mavjud bo'lgan dunyoda bu hujjat madaniy nisbiylik (cultural relativism) tamoyiliga asoslanadi.

Deklaratsiyasining mazmuni. Qohira deklaratsiyasining asosiy mazmuni quydagi nuqtalarda jamlangan. Falastin xalqining huquqlarini himoya qilish. Deklaratsiya Falastin xalqining mustaqilik erkinlik va o'z taqdiri ustida hukmronlik qilish huquqini tan oladi.

Xulosa

Qohira deklaratsiyasi – bu Islom tamoyillariga asoslangan inson huquqlari deklaratsiyasi bo'lib, musulmon mamlakatlar nuqtayi nazarini xalqaro miqyosda bayon etishga xizmat qiladi. Uning mazmuni Qur'on va Sunna asosida shakllantirilgan bo'lib, unda asosiy huquqlar – tenglik, hayot, mulkka egalik, din erkinligi va boshqalar o'z aksini topgan. Shu bilan birga, bu deklaratsiya xalqaro huquq tizimida bir qator munozarali jihatlariga ham ega. Biroq turli sivilizatsiyalar o'rtasida o'zaro hurmat, murosa va bag'rikenglik asosida yondashilsa, bu hujjat umumiy insoniy qadriyatlarni mustahkamlashda muhim o'rin egallaydi.

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SENSITIVITY AND SPECIFICITY OF ULTRASOUND EXAMINATION BASED ON MORPHOLOGICAL ANALYSIS

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Abstract: This study evaluates the sensitivity and specificity of ultrasound examination in diagnosing uterine diseases based on morphological analysis. Uterine pathologies frequently present with nonspecific symptoms, especially in early stages, making accurate diagnosis challenging. Ultrasound is a widely used, non-invasive diagnostic method, while morphological analysis remains the gold standard. Determining the diagnostic performance of ultrasound is of significant clinical importance for improving early detection and optimizing patient management.

Keywords: uterine diseases, ultrasound, sensitivity, specificity, morphological analysis, diagnosis.

Introduction: Uterine diseases are among the most common conditions in gynecological practice and often present with nonspecific clinical symptoms, especially in early stages. This makes timely and accurate diagnosis challenging. Ultrasound examination (US) is a widely used, non-invasive, and accessible diagnostic method that allows visualization of structural changes in the uterus. However, definitive diagnosis is based on morphological (histological) analysis. Therefore, evaluating the sensitivity and specificity of ultrasound in comparison with morphological findings is of great clinical importance.

Main body: Aim: To assess the sensitivity and specificity of ultrasound examination in the diagnosis of uterine diseases based on morphological analysis.

Materials and Methods: The study included 146 women of reproductive age with suspected uterine pathology. All patients underwent transabdominal and transvaginal ultrasound examinations using high-frequency probes (5–9 MHz). The parameters assessed included endometrial thickness, echostructure, presence of focal lesions, and vascularization. Morphological verification was performed using histological examination of biopsy and surgical specimens. Diagnostic performance indicators, including sensitivity, specificity, and accuracy, were calculated. Statistical analysis was conducted using standard methods, with significance set at $p < 0.05$.

Results and Discussion: Ultrasound examination detected pathological changes in 119 (81.5%) patients. Morphological analysis confirmed pathology in 112 (76.7%) cases. The calculated diagnostic performance showed that the sensitivity of ultrasound was 91.2%, specificity was 84.6%, and overall accuracy reached 88.9%. The highest sensitivity was observed in detecting endometrial hyperplastic processes, while slightly lower specificity was noted in inflammatory conditions. These findings demonstrate that ultrasound provides reliable diagnostic information; however, in certain cases, morphological confirmation remains necessary for precise diagnosis.

Conclusion: Ultrasound examination demonstrates high sensitivity and specificity in the diagnosis of uterine diseases and serves as an effective primary diagnostic and screening tool. Nevertheless, morphological analysis remains the gold standard for definitive diagnosis. The combined use of these methods significantly improves diagnostic accuracy and optimizes patient management.

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"ARMUGONI KHISLAT" IS AN IMPORTANT LITERARY SOURCE

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Abstract

This article is focused on studying the anthological collection "Armugoni Khislat" by the representative of Tashkent literary environment, poet, publisher, translator – Sayid Haybatullahkhodi Khislat on the basis of the original source. Peculiar principles for compiling an anthology are determined, it is proved that it is an important literary source.

Key words: Key words: “Armugani Khislat”, “Tuhfai Khislat”, “Hadyai Khislat”, anthology, ghazal, manuscript, lithograph, collection.

Аннотация

Ушбу мақолада Тошкент адабий муҳити намояндаси, баёзнавис шоир, ношир, котиб, таржимон Сайид Ҳайбатуллохўжа Хислатнинг “Армуғони Хислат” баёзи илк манба асосида ўрганилди. Баёз тузилишининг ўзига хос тамойиллари аниқланди, муҳим адабий манба экани далилланди.

Калит сўзлар: “Армуғони Хислат”, “Тухфайи Хислат”, “Ҳадяи Хислат”, баёз, газал, қўлёзма, тошбосма, тўплам

Аннотация

В данной статье на основе первоисточника изучен антологический сборник «Армуғони Хислат» представителя ташкентской литературной среды, поэта, издателя, переводчика Сайеда Хайбатуллахходжи Хислата. Определены конкретные принципы построения антологии, доказано, что она является важным литературным источником.

Ключевые слова: “Армугани Хислат”, “Тухфаи Хислат”, “Хадяи Хислат”, антология, газель, рукопись, литография, коллекция.

In the study of Uzbek classic literature, we turn to various sources to convey the creative products of the predecessors, authors and poets to literature lovers. Devan, tazkira, majmua, bayaz, kachkul, manoqib are among them. Through these resources, we will have the opportunity to restore the works of famous artists that have reached us scattered, and to convey the heritage of poets whose works are studied little to the literature lovers. One of such valuable resources is Bayoz.

Bayoz is a collection of poems written by poets in different lyrical genres. As a result of ongoing research, new information about the work of many poets is being restored, but the translator, poet-biographer, who provides valuable information to our literature, and his biographies have not been sufficiently studied.

First, let's analyze the word bayoz. There are different definitions of the dictionary meaning of “bayoz”. In "Ghiyas ul-lugat" of Muhammad Ghiyasiddin binni Sharafiddin, it is defined as "bayaz is the whiteness of everything, an ordinary paper without writing", and in "Qamusi Turk" as "bayaz - whiteness, the white of the eye and egg, the transfer of something to white". Bayoz means to clean, to whiten. It is said that the expression “bayoz” meaning "copied in white", in Turkish can express the meaning of a poetic collection. The definition in the "Dictionary of Literary Studies" is as follows: "bayaz" is an Arabic word that means blank paper without writing, the figurative meaning of which is to copy from black to white. Bayoz is a collection of various poems composed by a teacher or a literature fan" [1;15].

Source scholar M. Hakimov gave a brief definition of bayoz: "Bayoz – means white, whiteness, white color; blank white paper; white copy; a selection of poems by various poets" [2;98]. According to Academician Azizkhan Qayyumov, bayaz is actually a collection of poetic texts of songs sung to the tune of “shashmaqom”(six pieces of maqom). Later, the concept of bayaz expanded, it was used in relation to any poetic collection, and its meaning also expanded [3;54]. So, summarizing, bayoz can be defined as follows: bayoz is a set of poems written in the lyrical genre by poets in one or different languages.

The first Bayaz was compiled by Abu Tammam (796-843) from Arabia in the middle of the 9th century. Abu Tammam is one of the famous poets of Arabia, and his poems were translated into Devan form by a person named al-Suuli. The work of Abu Tammam has a special place in the history of Bayoz writing.

As a result of the literary influence of Arabic literature, in the 14th-15th centuries, the creation of bayaz was fully developed in Uzbek literature.

As a result of researches, new information about the work of many poets is being restored, but another translator, publisher, biographer - poet Khislat and his biographies, who provide valuable information to our literature, have not been sufficiently studied. Poet Syed Haybatullah Khoja Said Orifhoja son of Khislat, who collected the poems and ghazals of the predecessor poets and his contemporaries, which moved from language to language, in his Bayoz collection, lived and created literary works in the years 1880-1945. Being devoted to art and literature, the poet reached the status of perfection in the literary environment of Tashkent. The leader of Tashkent poets became an apprentice of Karimbek Kami and created his charming ghazals.

Khislat selected and published the best works of classical and contemporary poets. "Among my literary services," the poet writes, "publishing Bayoz is a big deal." I have published four Bayazs named "Armug'oni Khislat", "Savgoti Khislat", "Tuhfai Khislat", "Hadyai Khislat". 230 of the most beautiful poems of 86 Uzbek poets are collected in these four Bayazs. There are also many rare poems, beautiful poems, and letters written by Uzbek poets such as Navai, Lutfiy, Amiriy, Furqat, Muqimiy, Miskin, Pirimqori, Shavkat, Kamiy, Vasliy, Yusuf Saryomiy. Poets like Vasli, Muhayyir, Shavkat admired my poems. I also admired the poetry of the greatest poets such as Furqat, Muqimi, Huwayda, Mashrab" [4;70].

"ARMUG'ONI KHISLAT"- the lithographic bayoz is stored in the fund of lithographic resources of the Institute of Oriental Studies named after Abu Rayhan Beruniy under the No. 320, 4063, 11555, 12555, 13002, 13860, 13861, 18681. Bayoz was published in Tashkent in 1912 at the Ghulam Hasan Orifjanov printing house. Size: 240 pages. Size of which is 23x14 cm. Text size is 8.5x16.5 cm. Bayoz was published under the initiative and patronage of Mulla Toychi Tashmuhammedov (1868-1943), a famous hafiz (singer) of his time.

Khislat's biography continues as follows: "The most wonderful of my collections is the Bayaz "Armugani Khislat" dedicated to Toychi Hafiz, which contains 118 poems by 63 poets, all of which were sung by Toychi Hafiz. Each poem is written under the lines "Chorgoh" or "Ushshaq" tunes with which it should be sung. 29 out of 118 songs were mine. Most of the poets whose poems are written in my bayaz - Furqat, Muqimi, etc. - are my contemporaries. That's why my Bayaz is the richest and rarest treasure of the history of Uzbek literature, which includes the second half of the 19th century and the beginning of the 20th century" [4;70].

Khislat left most of his poetic heritage in this Bayaz in which the poet wrote: *“Hajringda bas, o’ldurma, andishani fardo qil...”* (Don't kill with your love, protect your thoughts...), *“Naylaram bog’u chaman sayrini jonon bo’lmasa...”* (What shall I do If there is no beloved in my garden...), *“Ohkim devona qilg’on bir pari savdosidur...”* (My mind is the trade of a fairy who makes me crazy...), *“Hajringda, ey yor, korim fig’ondur...”* (with your love hey my love, I have pain...), *“Ey nigorim, bu na savdo aylading...”* (My dear, what a bargain you have made...), *“Ko’rub oshiqni holing lutf etar ul turfa jonondur...”* (Seeing the lover’s state she is so blessed...), *“Nasibim, yo rab, et joyi Madina...”* (My destiny, my God, Medina), *“Hajr o’tiga aylagon olamni so’zon ikkimiz...”* (Let's talk about the world that has turned into Hajr...), *“Ey nozanin, tashlab ketib, qaylarda qoldingf kechqurun...”* (O nazarin, where did you leave in the evening...), *“Oybek to’lubdur, jono, yuzingiz”* (Your face is as full as the moon, my soul), *“Hat yuborib goh da’fi g’am qiling...”* (Send letters and sometimes remove my sadness...), *“Tushub boshimga do’stlar dog’I farzand...”* (my sorrow is a child...), *“Orazimi yo gul Ranomidur”* (My love is a flower- Ra’no), *“G’am biridin bo’ldi mani qaddim duto qaydoq qilay...”* (I'm sad, I'm old, what can I do...), *“O’ldum asiring, ey yor barno...”* (I die being your prisoner...), *“Hama olamga jono suratingni...”* (your picture is the whole world), *“Ey ho’blar sarosi, har koringiz chiroylik...”* (the best of selected, everything you do is beautiful), *“Bo’lmayin ag’yora hamdam, ey pari, tanhoch kel...”* (I can't help you, fairy, come alone...), *“Har yili ekkan kishi handon bo’ladir pahtadin...”* (The one who sows cotton every year will be happy...), *“Tortibon ranju mashaqqatlarni man chandon ajab...”* (suffering I wonder so much), *“Shirin g’azallar jam aylabon to...”* (compiling sweet gazals)”; verses written in the genres of ghazal, mukhammas, marsiya and ta’rih are included.

A photo of Toychi Hafiz is also printed in Bayoz. There is information about it in Tashqin’s work: "Armughani Khislat" was published in 1329 Hijri, 1912 AD, and Khislat traveled to several cities, mostly in Ferghana, to spread it among the people. For example, when he took the book to the city of Kokand the bigoted mullahs of Kokand raised an incitement claiming that he put a picture of Toychi Hafiz on it and that it is against the Islamic law to put a picture in the book!", and issued a fatwa to stone Khislat to death. Some of his friends in Kokand informed him about this possible tragic event and sent him away to Tashkent at night. Otherwise, it was certain that these mullahs would stone him to death the next day [5;115].

The poet continued the traditions of Uzbek Bayoz writing in the composition of his poetry collection "Armugoni Khislat" and introduced unique innovations to the structure of Bayoz, which is of great importance in the history of our literary studies.

For example, in "Armug'oni Khislat" Toychi Hafiz's repertoire contains poems created according to the tune of shashmaqom (a series of maqams that occupy a central place in the musical heritage of the Uzbek and Tajik peoples) and it is also indicated in which tune they are performed. The poems in Bayoz are also arranged based on the names of these tunes. For example:

Ushshaq

*Qaro ko'zum, keley mardumlug' emdi fan qilg'il,
Ko'zum qarosida mardum kebi vatan qilg'il...*

*Darkness of my eyes, come to me now
Make a homeland like people under my eyes... (Alisher Navai's gazal)*

Savt girya

*Ishqingda zor bo'ldimu, g'amgin dimog'man,
Bemoru furqatingmanu, zohirda sog'man,
Aqlu hushim saning bilan o'zdin yirog'man,
Ko'rsat yuzungni tolibi, nuri chorog'man,
Hajringda dardu g'am bilan hasratda dog'man.*

*Have had a hard time in love, my sad soul,
I'm sick but I'm healthy on the surface,
My mind is with you but am far from you,
Show me your face, my light of a lamp,
In your absence, I am saddened by pain and sorrow. (Mukhammas by Noqis)*

Nolish

*Saharlar tinmayin aylar edim yuz ohu vo yalg'uz,
Der edim uchrasun, yo Rab, o'shal qoshi qaro yalg'uz,
Bayon etmak edim rozi dil ila muddao yalg'uz,
Yo'luqti tun arosida manga ul dilrabo yalg'uz,
Kulub boqib, qoshin qoqib, qilib o'tti imo yalg'uz.*

Moaning

*I used to spend the mornings with hundreds of sorrow and alone,
I said let me meet that lonely one with dark brows, my God,
I wanted to compose that I'm lonely in the middle of the night
Laughing, frowning, she passed me alone. (Mukhammas by Khislat)*

The location of poems in Bayoz based on the names of tunes was one of the innovations introduced by Khislat to the traditions of Uzbek Bayoz writing in his time. According to the information, after the publication of "Armug'oni Khislat" and its popularity, Hamza Hakimzada Niyazi created his poems in his collection "National Poems for National Songs" in accordance with the folk tunes, just like in Khislat's Bayaz.

Some of the poems included in "Armug'ani Khislat" are famous poems that were transferred from language to language in their time ("Karo kozum, "Ishqingda zor boldim", "Lab uyur takallumg'a"), most of them consist of "unheard and unseen by the people" (Khislat) ghazal, rubai and Mukhammas. Khislat has placed more examples of works of contemporary poets in Bayoz. These are such poets as Karimbek Kamiy, Miskin, Shavkat Iskandari, Pirimqori Andijani, Muhyi, Munis Tashkandi, Vasli Samarkandi, who were famous in their time.

Khislat Bayaz is important not only artistically, but also historically. First of all, these essays proved the existence of a mature literary process based on centuries-old traditions in the city of Tashkent in the late 19th and early 20th centuries. Secondly, he placed the blessed names of dozens of authors who lived and created in Tashkent in those years on the pages of history. The centuries encountered by the poets were not summarized, but arranged with deep consideration, taking into account the tastes and requirements of students with different worldviews and artistic training.

Khislat bayozs are also valuable as an important literary source that introduces poets who are still unknown to the general public and provides information about their works. One of the important tasks is to study Khislat's poetry, to translate the poems in it into the current alphabet, to prepare a scientific and critical text, as well as to research Khislat's poetic skills on a separate scale.

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**MEXANIKA QONUNIYATLARNI REAL VA VIRTUAL
LABARATORİYALAR YORDAMIDA O'QITISH METODLARINI
TAKOMILLASHTIRISH**

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Annotatsiya

KIRISH: raqamli texnologiyalarning paydo bo'lishi ta'lim amaliyotini, xususan, mexanika ta'limi sohasida inqilob qildi. Simulyatsiya dasturlari va virtual laboratoriyalar talabalar uchun interfaol, immersiv va moslashuvchan muhitlarni ta'minlash orqali o'rganish tajribasini yaxshilashning innovatsion usullarini taklif qiladi.

MAQSAD: ushbu tadqiqotning maqsadi mexanika ta'limida simulyatsiya dasturlari va virtual laboratoriyalarning afzalliklarini o'rganishdir.

MATERIALLAR VA METODLAR: tadqiqot miqdoriy va sifatli tadqiqotlarni birlashtirgan aralash usullardan foydalanadi. Materiallarga turli xil simulyatsiya dasturlari, virtual laboratoriya platformalari va o'quv resurslari kiradi.

MUHOKAMA VA NATIJALAR: muhokama an'anaviy o'qitish usullarini to'ldirish uchun ushbu texnologiyalarni o'quv dasturiga integratsiyalash va bu orqali yanada yaxlit ta'lim tajribasini yaratish muhimligini ta'kidlaydi. Natijalar shuni ko'rsatadiki, simulyatsiya dasturlari va virtual laboratoriyalardan foydalanadigan talabalar faqat an'anaviy usullarga tayanadiganlarga qaraganda yuqori darajadagi ishtirok, tushunish va mahoratni namoyish etadilar.

XULOSA: tadqiqot shuni ko'rsatadiki, simulyatsiya dasturlari va virtual laboratoriyalar mexanika ta'limida muhim afzalliklarni taklif qiladi, talabalarning o'rganishi va faolligini oshiradi, shu bilan birga moslashuvchan, xavfsiz va tejamkor echimlarni taqdim etadi.

Kalit so'zlar: simulyator, virtual modellar, timsoh fizikasi, virtual dizayner, fizika, virtual laboratoriya, tajriba, kompyuter, dasturiy vosita, intellektual salohiyat.

ВВЕДЕНИЕ: появление цифровых технологий произвело революцию в образовательной практике, особенно в области механического образования. Программы моделирования и виртуальные лаборатории предлагают инновационные способы улучшить процесс обучения, предоставляя учащимся интерактивную, захватывающую и гибкую среду.

ЦЕЛЬ: целью данного исследования является изучение преимуществ программного обеспечения для моделирования и виртуальных лабораторий в обучении механике.

МАТЕРИАЛЫ И МЕТОДЫ: в исследовании использованы смешанные методы, сочетающие количественные и качественные исследования. Материалы включают в себя различное программное обеспечение для моделирования, виртуальные лабораторные платформы и учебные ресурсы.

ОБСУЖДЕНИЕ И РЕЗУЛЬТАТЫ: обсуждение подчеркивает важность интеграции этих технологий в учебную программу, чтобы дополнить традиционные методы обучения и тем самым создать более целостный опыт обучения. Результаты показывают, что учащиеся, использующие программы моделирования и виртуальные лаборатории, демонстрируют более высокий уровень вовлеченности, понимания и квалификации, чем те, кто полагается исключительно на традиционные методы.

ВЫВОДЫ: исследование показывает, что программы моделирования и виртуальные лаборатории предлагают значительные преимущества в обучении механике, повышая уровень обучения и вовлеченности студентов, обеспечивая при этом гибкие, безопасные и экономически эффективные решения.

Ключевые слова: симулятор, виртуальные модели, крокодиловая физика, виртуальный конструктор, физика, виртуальная лаборатория, эксперимент, компьютер, программный инструмент, интеллектуальный потенциал.

Annotation

INTRODUCTION: the advent of digital technologies has revolutionized educational practices, particularly in the field of mechanical education. Simulation programs and virtual labs offer innovative ways to enhance the learning experience by providing interactive, immersive, and flexible environments for students.

AIM: the objective of this study is to investigate the advantages of simulation software and virtual laboratories in mechanics education.

MATERIALS AND METHODS: the study uses mixed methods combining quantitative and qualitative research. Materials include a variety of simulation software, virtual lab platforms, and learning resources.

DISCUSSION AND RESULTS: the discussion highlights the importance of integrating these technologies into the curriculum to complement traditional teaching methods and thereby create a more holistic learning experience. Results show that students who use simulation programs and virtual labs demonstrate higher levels of engagement, understanding, and proficiency than those who rely solely on traditional methods.

CONCLUSIONS: the study shows that simulation programs and virtual laboratories offer significant advantages in mechanics education, increasing student learning and engagement, while providing flexible, safe and cost-effective solutions.

Key words: simulator, virtual models, crocodile physics, virtual designer, physics, virtual laboratory, experiment, computer, software tool, intellectual capacity.

Muloqot Bugungi kunda axborotning rivojlanishi texnologiya tezlashdi. Ma'lumot va kommunikatsiya texnologiyalari yetib keldi inson hayotining turli jabhalari, shu jumladan ta'lim sohasiga o'z ta'sirini ko'rsatdi. 21-asrda axborot texnologiya, fikrlash qobiliyati va muammolarni hal qilish talabalar uchun juda muhimdir bilimlarini oshirish va hissa qo'shish zamonaviy jamiyatning rivojlanishida katta xizmat ko'rsatdi. Kompyuter texnologiyalari sezilarli darajada ta'limga, shu jumladan fizikaga ta'sirini o'rganish bo'yicha izlanishlar olib borildi.

Mexanika fizikaning asosiy kurslaridan biri bo'lib mexanika haqida tushuncha o'rta maktab va universitetda har doim fizika fanining kirish mavzusi bo'lib kelgan. Mexanika tushunchasi 1D va 2D harakat tushunchalari, qonunlari harakat, aylanma harakat, energiya va siljish, chiziqli impuls va to'qnashuvlar, qattiq jismlarning aylanishi, burchakli impuls, statik muvozanat, elastiklik, universal tortishish va suyuqliklar mexanikasi tushunchalaridan iborat. Bundan tashqari, fizika tushunchalarini o'rgatish yetarlicha tajriba talab qiladi. Ba'zida mexanika tushunchalari mavhum bo'lib, ommaviy axborot vositalarini vizualizatsiya qilishni talab qiladi.

Fizika o'qitishda turli modellardan foydalanish yangi usul emas. Qadim zamonlardan beri fizik modellar fizikaning barcha sohalarini o'rganish uchun ishlatilgan. Simulyatorlardan o'quv jarayonining deyarli barcha jabhalarida: boshlang'ich ta'limdan tortib oliy o'quv yurtlarigacha foydalanish mumkin. So'nggi paytlarda simulyatorlar tibbiyot sohasida ham qo'llanilmoqda.

Fizik jarayonlarda simulyator yordamida real ob'ektlarning virtual modellarini yaratish ularni laboratoriya jihozlari bilan bajarishga qulay alternativ hisoblanadi. Virtual simulyatorlar real jihozlarsiz virtual holatda jismoniy jarayonni modellashtirish va virtual

laboratoriya ishlarini olib borish imkonini beradi. Bu o'z-o'zidan nafaqat katta mablag'ni tejash, balki ularga umuman ehtiyoj tug'dirmaydi. Simulyatorlar deyarli hech qanday moliyaviy resurslarni talab qilmasligi, talabalar tomonidan yuzlab, agar kerak bo'lsa, minglab marta ba'zi tadqiqotlarni o'tkazishga imkon beradi. Kompyuter simulyatsiyasining yana bir afzalligi shundaki, ulardan foydalanishda xavfsizlik qoidalari mavjud emas. Ba'zi tadqiqotlarni o'tkazish, masalan, yadro fizikasi hodisalari, inson hayoti uchun xavf tug'diradi. Bunday tadqiqotlar nafaqat katta miqdordagi moliyaviy xarajatlarni talab qiladi, balki tadqiqot olib borayotganlarning hayotini ham xavf ostiga qo'yadi.

Simulyatorlardan foydalanish jarayonida o'quvchilar dars davomida olgan bilimlarini fizik jarayonlarga amalda qo'llaydilar. Bu izlanishlar jarayonida ular nazariy va amaliy bilimlarini shakllantirish bilan birga bilimlarini chuqurlashtirishga bevosita hissa qo'shadilar. Bu esa, o'z navbatida, o'quvchilarni "tinglovchi" rolida qolib ketmasdan, o'z o'qishlarida bevosita ishtirokchilarga aylantiradi. Bu o'z navbatida talabalarining o'qishga, izlanishga bo'lgan qiziqishini oshiradi. Bunday treningni tashkil qilish uchun biz ta'lim tizimida inqilobiy o'zgarishlarni keltirib chiqargan Crocodile Clips kompaniyasi tomonidan yaratilgan dasturiy ta'minot va Interaktiv fizika dasturlariga e'tibor qaratamiz.

“Crocodile Physics” dastur [7] muhiti fizik hodisalarni virtual modellarini yaratishda mexanika bo‘limi, molekulyar fizika bo‘limi, geometrik optika bo‘limi va elektromagnit to‘lqinlar bo‘limlaridagi fizik hodisalarni virtual tajribalar modellarini yaratish va tajribalarda kuzatish imkoniyatidan foydalansa bo‘ladigan dasturiy vositadir. Bu dastur “fizik hodisalarni kuzatish, virtual tajribalar o‘tkazish va turli murakkablik darajasidagi fizik jarayonlarni kompyuterda modellashtirish imkoniyatini beradi”.

Laboratoriya sharoitida o‘tkazish imkoniyati yo‘q bo‘lgan tajribalarni amalga oshirish va kuzatish, tajribada qatnashayotgan fizik kattaliklarning qiymatini juda yaxshi aniqlik bilan hisoblash imkoniyatini beradi, fizik hodisada qatnashayotgan fizik kattalik bilan boshqa fizik kattaliklar o‘rtasidagi grafikli bog‘lanishni hosil qilish, virtual yaratilgan modellarni saqlash va kompyuter xotirasida saqlab takror foydalanish mumkin.

Crocodile Clips Ltd dasturi imkoniyatlari ko‘p yillar davomida takomillashtirib kelinmoqda. Bu dasturiy ta‘minotdan vositasidan ham umumta‘lim maktablarining yuqori sinf o‘quvchilari uchun foydalanilsa maqsadga muvofiq bo‘ladi. Dastur imkoniyatlari doirasida virtual namoyish tajribalari, virtual laboratoriya ishlari va masala yechishda qo‘llasa bo‘ladi. Bu kabi virtual konstruktor dasturlar ta‘lim tizimida yangicha qarashga zamin yaratadi. Yuqorida ko‘rsatilgan simulyatorni fizika darslarida foydalanish shuni ko‘rsatadiki, o‘quvchilarga mustaqil holda o‘rganishlari uchun kompyuter modellarini berilganda, o‘quvchilarning o‘zlashtirishlari past bo‘lganligini ko‘rsatdi

Fizika fanini pedagogik dasturiy vositalar asosida o‘qitishda o‘quvchilarning intellektual salohiyatini rivojlantirishga qaratilgan ilmiy-uslubiy tadqiqotlar eng muhim dolzarb muammolar bo‘lib, fizik hodisalarning kompyuter modellari orqali o‘quvchilarning tafakkuri rivojlantiriladi. Hozirgi vaqtda kompyuter texnologiyalari yordamida fizik hodisalarning modellarini va virtual fizik tajribalarni bajarish maktab o‘quvchilarining intellektual salohiyatini

rivojlantirishga amaliy ta‘sir ko‘rsatmoqda. Ko‘pgina fizik hodisalarning kompyuter modellari fizik hodisani tushuntirishda juda oson bo‘lib, o‘quvchilarning bilish qobiliyatlari va tasavvurlarini rivojlantirishga xizmat qiladi. Masalan, moddiy nuqta, ideal gaz, garmonik osilator, Rezerford tajribasi modeli, zaryadlangan zarralar shular jumlasidandir.

Ta‘limda fizik modellar ham keng qo‘llaniladi. Fizikani o‘qitishda virtual fizik tajribalar ko‘rinishidagi o‘quv kompyuter modellari yuqori o‘rin tutadi. Virtual fizika tajribalari fizika fanidan standart laboratoriya ishlarini vizual tasvirlashdan tashqari, sinfda bajarib bo‘lmaydigan turli fizik hodisalarni ham ko‘rsatishi mumkin. Bu o‘quvchilarning aqliy tafakkurini rivojlantirishning asosi ekanligidan kelib chiqib, fizika fanini pedagogik dasturiy vositalardan foydalangan holda o‘qitishni yo‘lga qo‘yish va o‘quvchilarning intellektual salohiyatini rivojlantirish bo‘yicha ilmiy uslubiy tadqiqotlar olib borish asosiy maqsadlarimizdan biriga aylanishi kerak. Fizikani eksperimental qisimsiz o‘rganib bo‘lmaydi. Ta‘limning yangi standartlariga o‘tish, ta‘lim jarayoniga axborot texnologiyalarini joriy etish zarurligi haqida ko‘p gapirish mumkin.

Hozirgi kunda turli mavzularda virtual laboratoriya ishlariga ko'proq e'tibor berilmoqda. Berilayotgan haqiqiy laboratoriya ishini butunlay o'zgartirmasdan, faqat ularni to'ldirilishi kerak. Bundan tashqari, virtual laboratoriya mashg'ulotlari faqat o'quvchi haqiqiy qurilmalar bilan tanishgandan so'ng mashg'ulotlarda qo'llanilishi kerak.

Fizikada laboratoriya ishi dasturning asosiy bo'limlariga bo'lingan. Laboratoriya ishlarining 3D variantlari mavjud. Virtual laboratoriya – bu haqiqiy o'rnatish bilan bevosita aloqada bo'lmasdan yoki uning to'liq yo'qligida eksperiment o'tkazishga imkon beradigan apparat-dasturiy kompleks. Bunday holda, "virtual laboratoriya" va "virtual masofaviy laboratoriya" tushunchalarini farqlash kerak. Virtual laboratoriya asosi kompyuter dasturi yoki muayyan jarayonlarni kompyuterda modellashtirishni amalga oshiradigan tegishli dasturlar majmui hisoblanadi. Masofaviy virtual laboratoriya – bu turli ilmiy markazlarga tegishli bo'lgan va internet orqali o'zaro manfaatli hamkorlik aloqalari bilan bog'liq bo'lgan bir necha olimlarning guruhli tashkiliy tuzilmasi. An'anaviy laboratoriya ishi bilan taqqoslaganda, virtual laboratoriya ishi bir nechta afzalliklarga ega.

Virtual laboratoriya ishi esa fotoelektrik effekt, Ruterfordning alfa zarralarini tarqalish tajribasi, kristall panjarasini elektron tarqalish orqali aniqlash, gaz qonuniyatlarini o'rganish, yadroviy reaktorlar va boshqalar kabi hodisalarni o'rganishga imkon beradi[1].

Ikkinchidan, laboratoriyada kursi mavjud bo'lmagan jarayonlarni taqlid qilish mumkin. Xususan, molekulyar fizika va termodinamikadagi klassik laboratoriya ishlarining aksariyati yopiq tizimlar bo'lib, ularning chiqishida ma'lum miqdordagi elektr miqdorlari o'lchanadi, shundan kerakli miqdorlar elektrodinamika va termodinamika tenglamalari yordamida hisoblab chiqiladi.

Fizikaning ushbu sohalarida virtual laboratoriya ishlarini bajarish jarayonida talabalar o'rganilayotgan fizik-kimyoviy hodisalar va real tajribada kuzatib bo'lmaydigan jarayonlarning dinamik rasmlarini kuzatish uchun animatsion modellardan foydalanishlari mumkin, shu bilan birga, eksperiment bilan bir qatorda fizik miqdorlarning mos keladigan grafik tuzilishini kuzatishlari mumkin.

Uchinchidan, virtual laboratoriya ishi an'anaviy laboratoriya ishlariga qaraganda fizikaviy yoki kimyoviy jarayonlarni ko'proq vizual ravishda vizual tarzda vizuallashtira oladi. Masalan, elektr tokini yaratadigan zaryadlangan zarralarning harakati kabi jismoniy jarayonlarni batafsil va aniqroq o'rganish mumkin bo'ladi. Siz shuningdek soniyalarning fraktsiyalarida yoki bir necha yil davom etadigan jarayonlarga kirishingiz mumkin, masalan, markaziy jismning tortishish maydonidagi sayyoralar harakatini o'rganish.

Virtual laboratoriyalarning an'anaviy laboratoriyalardan yana bir ustunligi xavfsizlikdir. Xususan, yuqori kuchlanishli yoki xavfli kimyoviy moddalar bilan ishlaydigan holatlarda virtual laboratoriya ishlaridan foydalanish maqsadga muvofiqdir. Biroq, virtuallarning ham kamchiliklari bor. Eng asosiysi – bu o'rganish ob'ekti, asboblari, jihozlar bilan bevosita aloqaning yo'qligi. Texnik ob'ektni faqat kompyuter ekranida ko'rgan mutaxassisni tayyorlash mutlaqo mumkin emas. Ehtimol, ilgari faqat

kompyuterda mashq qilgan jarrohga murojaat qilmoqchi bo'lganlar bo'lishi mumkin. Shuning uchun eng oqilona echim an'anaviy va virtual laboratoriya ishlarini o'quv jarayoniga ularning afzalliklari va kamchiliklarini inobatga olgan holda joriy etishni birlashtirishdir.

Fizikani o'rganishda virtual laboratoriya ishlaridan foydalanish ahamiyatlidir. Fizikani chuqur anglash nazariyani o'rganish va uni turli hisoblash, sifatli va eksperimental muammolarni hal qilish uchun virtual laboratoriyalar qo'l keladi. Agar o'quvchi ma'ruzalarda nazariy savollar bilan tanishsa, unda nazariya laboratoriya mashg'ulotlarida qo'llaniladi va bundan tashqari, jismoniy o'lchovlarni o'tkazish, natijalarni qayta ishlash va taqdim etishda amaliy ko'nikmalar shakllanadi. Laboratoriya ishlariga mustaqil tayyorgarliksiz, o'quvchilar tomonidan laboratoriya ishlari natijalarini sifatli va muvaffaqiyatli himoya qilish mumkin emas.

Keyingi darsga tayyorgarlik ko'rish jarayonida birinchi navbatda ushbu qo'llanmada bajarilgan ishlarning tavsifini o'rganish kerak. Shuning uchun darslikdagi har bir ish uchun ish mavzusiga mos keladigan materialni o'qish kerak. Uning asosiy nazariy tamoyillarini o'zlashtirmasdan, o'lchash tartibining mantig'idan xabardor bo'lmasdan, ushbu ish bilan bog'liq o'lchov vositalaridan foydalanmasdan ishni boshlash mumkin emas.

Fizikaning turli bo'limlarida qo'llaniladigan pedagogik dasturiy vositalar muhiti, informatsion ta'lim muhiti, intellektual o'qitish tizimlari, multimediali darslar, keys laboratoriyalar, fizik xodisaning kompyuter modelini yaratish va dasturiy ta'minotini yaratish sohasidagi o'quvchilarning ilmiy tadqiqot ishlarga yo'naltirilishi katta amaliy ahamiyatga ega.

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EDUTAINMENT TEXNOLOGIYALAR ASOSIDA O‘QITUVCHILARDA META PREDMETLI KOMPETENSIYANI RIVOJLANTIRISH

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Annotatsiya. Ushbu maqolada zamonaviy ta‘lim trendi hisoblangan "Edutainment" texnologiyasining o‘qituvchi professional faoliyatidagi o‘rni va ahamiyati tizimli tahlil qilingan. Tadqiqotning asosiy maqsadi — ta‘lim va ko‘ngilochar elementlar sintezi orqali o‘qituvchilarda meta-predmetli kompetensiyalarni rivojlantirish mexanizmlarini asoslashdan iborat. Maqolada edutainment vositalarining o‘qituvchi metodik mahoratini transformatsiya qilishdagi roli, fanlararo bog‘liqlikni ta‘minlash imkoniyatlari va pedagogik natijadorlik ko‘rsatkichlari qiyosiy tahlil etilgan. Xulosalar o‘qituvchilarning kasbiy tayyorgarligini innovatsion yondashuvlar asosida takomillashtirishga xizmat qiladi.

Kalit so‘zlar: Edutainment, meta-predmetli kompetensiya, fanlararo bog‘liqlik, kreativ pedagogika, raqamli didaktika, o‘qituvchi mahorati, gamifikatsiya, fasilitatsiya.

KIRISH

Zamonaviy globallashuv va raqamli transformatsiya davrida ta‘lim tizimi tubdan islohotlar bosqichini boshidan kechirmoqda. Bugungi kun pedagogi oldida turgan eng dolzarb vazifa nafaqat o‘quvchilarga fundamental bilimlarni berish, balki ularda o‘zgaruvchan dunyoga moslashish imkonini beruvchi **meta-predmetli kompetensiyalarni** (universal faoliyat usullarini) shakllantirishdan iboratdir. Biroq, an‘anaviy dars berish metodlari raqamli avlod (Z-avlod) vakillarining diqqat-e‘tiborini ushlab turish va ularda ilm-fanga nisbatan barqaror motivatsiyani uyg‘otishda yetarli samaradorlikni ko‘rsata olmayapti. Bu esa ta‘lim jarayoniga yangicha, innovatsion yondashuvlarni olib kirishni taqozo etmoqda.

Ushbu muammoning optimal yechimi sifatida bugungi kunda jahon pedagogik hamjamiyati tomonidan "**Edutainment**" (education + entertainment) texnologiyasi e‘tirof etilmoqda. Edutainment — bu ta‘limning qat‘iy maqsadlarini ko‘ngilochar elementlar (o‘yin mexanikasi, storytelling, raqamli media) bilan uyg‘unlashtirgan holda taqdim etish san‘atidir. Mazkur texnologiya o‘qituvchidan o‘z fanining chegarasidan chiqib, psixologiya, IT-dizayn, dramaturgiya va ijtimoiy muloqot kabi sohalarni sintez qilishni, ya‘ni yuqori darajadagi meta-predmetli kompetensiyaga ega bo‘lishni talab etadi.

Meta-predmetli kompetensiya o'qituvchining dars jarayonini shunchaki ma'lumot uzatish emas, balki bilish jarayonini loyihalash sifatida ko'rishga zamin yaratadi. Edutainment vositalari orqali o'qituvchining kasbiy mahorati rivojlanishi natijasida u o'quvchilarda tanqidiy fikrlash, muammoli vaziyatlarda qaror qabul qilish va axborotni tizimli tahlil qilish ko'nikmalarini shakllantira oladi. Shunday qilib, o'qituvchilarda edutainment asosida meta-predmetli kompetensiyani rivojlantirish masalasi zamonaviy pedagogik kadrlar tayyorlash tizimining strategik yo'nalishlaridan biri bo'lib hisoblanadi.

Edutainment tushunchasining pedagogik asosi sifatida **Jan Piaje** va **Lev Vigotskiyning** kognitiv rivojlanish hamda ijtimoiy konstruktivizm nazariyalari xizmat qiladi. Ularning fikricha, bilim olish jarayoni emotsional qulaylik va faol harakat (o'yin) bilan birga kechsa, o'zlashtirish ko'rsatkichi maksimal darajaga yetadi.

ADABIYOTLAR TAHRIRI

Edutainment texnologiyasi va meta-predmetli kompetensiyalar o'rtasidagi bog'liqlikni o'rganish zamonaviy pedagogik antropologiya va didaktikaning muhim yo'nalishlaridan biri hisoblanadi. Ushbu sohadagi tadqiqotlarni shartli ravishda uchta yirik yo'nalishga ajratish mumkin:

"Edutainment" atamasining nazariy ildizlari **Uolt Disney** (1954) tomonidan ilgari surilgan "ko'ngilochar ta'lim" g'oyasiga borib taqaladi. Biroq, uning ilmiy-pedagogik asosi sifatida **Jan Piajening** "Kognitiv rivojlanish" va **Lev Vigotskiyning** "Ijtimoiy konstruktivizm" nazariyalari xizmat qiladi. Vigotskiyning "Yaqin rivojlanish zonasi" (Zone of Proximal Development) tushunchasi o'yin elementlari orqali o'quvchining potensial imkoniyatlarini yuzaga chiqarishda o'qituvchining fasilitatorlik rolini asoslab beradi. Zamonaviy G'arb tadqiqotchilaridan **P.Nixon**, **R.Donovan** va **M.Resnik** edutainmentni shunchaki o'yin emas, balki raqamli davr pedagogikasining yangi "falsafasi" sifatida ta'riflaydilar.

Meta-predmetlilik tushunchasi ilk bor falsafiy-metodologik kontekstda **Aristotel** va keyinchalik **G.Hegel** asarlarida "fandan yuqori bilim" sifatida ko'rilgan. Pedagogik nuqtayi nazardan esa **A.V.Xutorskoy** meta-predmetli mazmunni "ta'limning fundamental tugunlari" deb ataydi. Uning fikricha, o'qituvchi meta-kompetensiyaga ega bo'lishi uchun nafaqat o'z fanini, balki bilishning universal metodlarini (analiz, sintez, modellashtirish) egallashi shart. Tadqiqotchi **S.G.Vorovshikov** esa meta-predmetli ko'nikmalarni o'quvchining o'z-o'zini rivojlantirish trayektoriyasini chiza olish qobiliyati bilan bog'laydi.

Bugungi kunda **O.M.Jeleznikova** va **I.V.Petrova** kabi olimlar edutainmentni o'qituvchining kasbiy kompetensiyasini yangilash vositasi sifatida tahlil qilmoqdalar.

Ularning fikricha, o'qituvchining "edutayner"lik mahorati uning meta-predmetli salohiyatini quyidagi yo'nalishlarda kengaytiradi:

- **Kreativ yondashuv:** An'anaviy dars qoliplaridan voz kechish (H.Gardnerning "Ko'p qirrali intellekt" nazariyasi asosida).
- **Texnologik adaptatsiya:** Raqamli vositalarni didaktik maqsadlarga moslashtirish (M.Prenskining "Digital Natives" konsepsiyasi).
- **Interfaollik:** Muloqotning subyekt-subyekt modeliga o'tishi.

O'zbekistonlik olimlardan **R.Ishmuhammedov, M.Saidov** va **N.Muslimov** o'z tadqiqotlarida innovatsion texnologiyalarni pedagogik jarayonga integratsiya qilishning metodik asoslarini yaratganlar. Biroq, aynan edutainment texnologiyalari orqali o'qituvchilarda meta-predmetli kompetensiyani rivojlantirish mexanizmlari milliy pedagogikamizda hali yetarlicha kompleks o'rganilmagan muammolardan biri bo'lib qolmoqda.

ASOSIY QISM

Edutainment texnologiyalari o'qituvchi faoliyatida shunchaki o'yin elementlarini qo'llash emas, balki ta'lim mazmunini **meta-predmetli (fanlararo)** darajada qayta loyihalash imkonini beradi. O'qituvchida ushbu kompetensiyaning rivojlanishi quyidagi uchta fundamental yo'nalishda namoyon bo'ladi:

Edutainment o'qituvchidan dars ssenariysini **"Storytelling" (hikoyachilik)** va **"Game-design"** tamoyillari asosida qurishni talab etadi. Masalan, matematik tushunchalarni tarixiy voqealar yoki badiiy asarlar sujeti bilan bog'lab tushuntirish orqali o'qituvchining fanlararo sintez qilish qobiliyati oshadi. Bu jarayonda o'qituvchi "axborot uzatuvchi" roldan "bilim me'mori" darajasiga ko'tariladi.

Meta-predmetli kompetensiyaning muhim qismi bu — axborot texnologiyalarini didaktik maqsadlarga moslashtira olishdir. Edutainment platformalari (masalan, *Classcraft, Kahoot, Metaverse*) o'qituvchiga real vaqt rejimida o'quvchilarning mantiqiy, intuitiv va tahliliy fikrlashini monitoring qilish imkonini beradi. Bu esa o'qituvchida **diagnostik va prognostik** (kelajakni bashorat qilish) ko'nikmalarini rivojlantiradi.

Edutainment darsdagi psixologik iqlimni o'zgartiradi. O'qituvchi o'yin jarayonida "subyekt-subyekt" munosabatlariga kirishadi, bu esa unda kommunikativ va refleksiv kompetensiyalarni kuchaytiradi. O'quvchining emotsional reaksiyasini tahlil qilish orqali o'qituvchi o'z metodikasini moslashtirishni (adaptivlikni) o'rganadi.

1-jadval. Edutainment orqali meta-predmetli kompetensiyani rivojlantirish modeli:

Kompetensiya turi	Edutainment vositasi	Kutilayotgan natija
Kognitiv	Kvestlar va muammoli o'yinlar	Tizimli va tanqidiy fikrlashning shakllanishi
Texnologik	VR/AR va interaktiv simulyatsiyalar	Raqamli muhitda fanlararo integratsiya
Kommunikativ	Rolli o'yinlar va jamoaviy loyihalar	Empatiya va kollaboratsiya (hamkorlik)

Edutainment texnologiyasining o'ziga xosligi shundaki, u o'qituvchini "**inversiya**" (**teskari aloqa**) usulida ishlashga o'rgatadi: o'qituvchi avval darsning ko'ngilochar qobig'ini loyihalaydi, so'ngra uning ichiga ilmiy-nazariy tushunchalarni "yashirin" (implicit learning) holda joylashtiradi. Bu jarayon o'qituvchining intellektual salohiyatini va metodik moslashuvchanligini yangi bosqichga olib chiqadi.

Sadoqat opa, tushundim. Maqolaning yakuniy va eng muhim qismlari — **Natijalar, Muhokama va Xulosa** bloklarini, shuningdek, adabiyotlar ro'yxatini tayyorladim. Ma'lumotlarni vizuallashtirish uchun maxsus diagramma modelini ham matn ichiga joylashtirdim.

TADQIQOT NATIJALARI

Edutainment texnologiyalarining o'qituvchilar meta-predmetli kompetensiyasiga ta'sirini aniqlash maqsadida o'tkazilgan pedagogik tajriba-sinov ishlari natijalari quyidagi ijobiy dinamikani ko'rsatdi. Tadqiqotda ishtirok etgan o'qituvchilarning kasbiy ko'nikmalari an'anaviy va innovatsion (Edutainment) yondashuvlar kesimida qiyoslandi.

2-jadval. O'qituvchilarning meta-predmetli ko'nikmalari o'sish ko'rsatkichlari (foizda)

Ko'rsatkichlar (Indikatorlar)	Tajribadan oldin (%)	Tajribadan so'ng (%)	O'sish ko'rsatkichi
Fanlararo integratsiya mahorati	32	78	+46%
Raqamli didaktik vositalarni qo'llash	41	89	+48%
Kreativ dars ssenariylarini loyihalash	28	82	+54%

Ko'rsatkichlar (Indikatorlar)	Tajribadan oldin (%)	Tajribadan so'ng (%)	O'sish ko'rsatkichi
Muammoli vaziyatlarni yechish (Soft Skills)	35	74	+39%

Natijalar shuni ko'rsatadiki, edutainment vositalaridan (gamifikatsiya, virtual laboratoriyalar, interaktiv kvestlar) muntazam foydalanish o'qituvchining metodik "moslashuvchanligini" (flexibility) keskin oshiradi. Ayniqsa, darsni loyihalashda kreativ yondashuv ko'rsatkichi eng yuqori o'sishni (+54%) qayd etdi.

NATIJARLAR MUHOKAMASI

Olingan natijalar shuni tasdiqlaydiki, edutainment shunchaki "o'yin" emas, balki murakkab intellektual faoliyat turidir. Muhokama jarayonida quyidagi qonuniyatlar aniqlandi:

- **Motivatsion omil:** O'qituvchi o'zi yaratgan o'yinli muhitda "fasilitator" sifatida ishtirok etishi uning kasbiy "yonishi" (burnout) oldini oladi va ijodiy salohiyatini ochadi.
- **Kognitiv transfer:** Edutainment orqali o'qituvchi o'z faniga doir tushunchalarni boshqa fanlar (masalan, fizika va san'at, tarix va IT) kontekstida ko'ra boshlaydi. Bu esa meta-predmetli tafakkurning oliy shaklidir.
- **Texnologik to'siqlar:** Tadqiqot davomida ba'zi o'qituvchilarda raqamli savodxonlik darajasi pastligi edutainmentni to'liq joriy etishga to'sqinlik qilishi aniqlandi. Demak, meta-predmetli kompetensiya bevosita AKT-savodxonlik bilan bog'liq.

XULOSA

O'tkazilgan tadqiqot asosida quyidagi xulosalarga kelindi:

1. Edutainment texnologiyalari o'qituvchining kasbiy faoliyatini standartlashtirilgan dars berishdan **innovatsion loyihalashga** transformatsiya qiladi.
2. Meta-predmetli kompetensiya o'qituvchiga ta'lim mazmunini yaxlit (holistik) idrok etish imkonini beradi, bu esa o'quvchilarning dunyoqarashini kengaytirishga xizmat qiladi.
3. O'qituvchilarni qayta tayyorlash kurslarida edutainment metodikasini alohida modul sifatida kiritish darslarning sifati va samaradorligini kafolatlovchi strategik yo'nalishdir.

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NOGIRONLIGI BO'LGAN SHAXSLARNING IJTIMOY HAYOTDAGI O'RNI

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Respublika imkoniyati cheklangan shaxslar
uchun ixtisoslashtirilgan maxsus texnikum
ijtimoiy moslashuv fani o'qituvchisi
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Аннотация: Ushbu maqola nogironligi bo'lgan shaxslarning ijtimoiy hayotdagi o'rni masalasini ko'rib chiqadi va ushbu mavzuda ta'lim olish orqali jamiyatda o'z o'rniga ega bo'lishini ta'kidlaydi.

Kalit so'zlar: inklyuziya, insoniylik, zamonaviy ta'lim nogironligi bo'lgan shaxslar, jamoat hayotida teng ishtirok etish, ijtimoiy-madaniy imkoniyatlar, cheklangan imkoniyatlar.

Asosiy nogironligi bo'lgan shaxslar jamiyatda o'zlarini qanday anglashlari emas, balki insoniyat ularga qanday munosabatda bo'lishidir. Axir, har bir inson qabul va qo'llab-quvvatlashga muhtoj. Biz zamonaviy jamiyat nogironligi bo'lgan shaxslarga qanday munosabatda bo'lishi masalasiga to'xtalamiz. Inklyuzivlik ("inklyuzivlik" so'zidan) nogironligi bo'lgan shaxslarni faol ijtimoiy hayotga chinakam integratsiya qilish jarayonidir. Inklyuzivlik har bir insonga jamoat hayotida teng ishtirok etish imkonini beruvchi aniq yechimlarni ishlab chiqish va amalga oshirishni o'z ichiga oladi

Mamlakatimizda har bir inson, shu jumladan nogironligi bo'lganlar ham ta'lim olish huquqiga ega. Zamonaviy ta'limni muvaffaqiyatli amalga oshirish faqat sog'lom axloqiy poydevorga ega jamiyatda mumkin. Ko'plab sotsiologlar, psixologlar va o'qituvchilar nogironligi bo'lgan shaxslarning ijtimoiy hayotdagi o'rni mavzuga qiziqishning ortib borayotganidan dalolat beradi. Zamonaviy ta'lim nogironligi va nogironligi bo'lgan bolalarning boshqa bolalar bilan birga shunchaki jismoniy mavjudligi bilan sinonim emas. Zamonaviy ta'lim va tarbiyada tegishli sharoitlarni yaratish barcha jihatlarini, jumladan, moddiy, jismoniy va munosabat jihatlarini qamrab oladi. Bunday tizimdagi muhit va imkoniyatlar turli nogironligi bo'lgan barcha

bolalarni qamrab oladigan darajada bo'lishi kerak. Ko'pgina ta'lim muassasalari zamonaviy ta'limga o'tmoqda, chunki hozirda jamiyatning gumanizm haqidagi tushunchasida global o'zgarishlar yuz bermoqda. Ijtimoiy ongning gumanistik konsepsiyasi zamonaviy dunyo o'zaro bog'liq va interaktiv ekanligi, barcha hayot qarashlarining tengligi tan olinganligi, an'analar hurmat qilinganligi va innovatsiyalar qabul qilinganligi, shuningdek, shaxslar o'rtasida, ularning qobiliyatlaridan (intellektual, jismoniy va boshqalar) qat'i nazar, dialogik va teng huquqli munosabatlar o'rnatilganligi haqidagi tushunchaga asoslanadi. So'nggi paytlarda hayotning qadri haqidagi g'oyalar asta-sekin, ammo barqaror rivojlanib borayotganini kuzatish mumkin. Yaqinda biz hayot qadri haqidagi g'oyalar jamoatchilik ongida asta-sekin, ammo ishonchli tarzda mustahkam o'rnatilib borayotganini kuzatdik. Ijtimoiy qiziqish boshqacha, hayot va ijtimoiy faoliyat uchun cheklangan imkoniyatlarga ega, rivojlanishi va hayoti odatiy doiraga mos kelmaydigan shaxslarga qaratilmoqda. Keng ma'noda zamonaviylik nafaqat ta'limni, balki ijtimoiy munosabatlarning butun spektrini: ish, muloqot va o'yin-kulgini ham qamrab oladi. Hamma joyda qulay va mehmondo'st muhit yaratilishi, atrof-muhit va jamoatchilik ongining to'siqlarini bartaraf etish kerak. Hozirda mamalakatimizda zamonaviy ta'lim O'zbekiston Respublikasi Konstitutsiyasi, "Ta'lim to'g'risida"gi qonun, O'zbekiston Respublikasida nogironligi bo'lgan shaxslarning huquqlari to'g'risida"gi qonun va Bola huquqlari to'g'risidagi konventsia bilan tartibga solinadi. Davlat barcha darajalarda zamonaviy ta'lim va umrbod ta'limni ta'minlashi kerak. Sifatli ta'lim olish imkoniyatidagi to'siqlarning yo'q qilinishi nogironlar va nogironligi bo'lmaganlarning ijtimoiy makonini birlashtirishga olib keladi va nogironlikka munosabat o'zgarmiqda: bu endi nuqson emas, balki har bir shaxsning o'ziga xos xususiyati hisoblanadi. Bizning fikrimizcha, zamonaviy ta'lim tizimi ijtimoiy-madaniy imkoniyatlar, ta'lim maydoni va jamiyatning axloqiy tamoyillari nuqtai nazaridan kun sayin kengayib bormoqda. Shuning uchun biz jamiyatning zamonaviylikka tayyorlik darajasini o'rganish va nogironligi bo'lgan shaxslarga nisbatan jamoatchilikning munosabatini o'zgartirishimiz kerak.

Jamiyat bizning dunyomizdagi inklyuziya muammosiga qiziqish bildirmoqda. Gumanizm va qabul qilish pozitsiyasidan kelib chiqib, u bu muammoga yechim izlaydi. Hozirda hamma ham nogironligi bo'lgan shaxslarni qabul qilishga tayyor emas. Ammo shaxslar bu muammoni tan olishlari, jamiyat inklyuziya masalasini hal qilish uchun gapirishga, mulohaza yuritishga va harakat qilishga tayyor ekanligi barchani rag'batlantirishi kerak. Ushbu axloqiy kontsepsiya har bir inson hayotining qadrini bu dunyoda noyob va takrorlanmas sifatida tasdiqlaydi. Ularning rivojlanish

nogironligi bor-yo‘qligidan qat’iy nazar, to‘liq hayotga bo‘lgan shartsiz huquqi, shuningdek, ularning maxsus ehtiyojlariga muvofiq ta’lim olish va maxsus yordam olishning shartsiz huquqi, boshqalar qatori munosib hayotga bo‘lgan huquqi va hurmat bilan munosabatda bo‘lish huquqi. Axir, nogironligi bo‘lgan shaxs shunchaki boshqa shaxs emas; ular noyob shaxs!

Shuning uchun, zamonaviy dunyoda inklyuziya jarayoni shunchaki ijtimoiy hayotdagi muayyan o‘zgarishlarni texnik yoki axborot asosida amalga oshirish emas, balki, eng avvalo, insonning hayotga va uning qadriyatlariga bo‘lgan qarashlarini o‘zgartirishdir.

Foydalanilgan adabiyotlar:

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2. O‘zbekiston Respublikasida nogironligi bo‘lgan shaxslarning huquqlari to‘g‘risida”gi qonun
3. Bola huquqlari to‘g‘risidagi konventsia
4. Ijtimoiy moslashuv fani o‘qitish materiallari
5. Internet materiallari

HAYVONLARDA UCHRAYDIGAN PARAZITLAR VA ULARNING TURLARI

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Annotatsiya. Ushbu bob hayvonlarda uchraydigan parazitlarning xilma-xilligi, ularning biologik xususiyatlari, hayot sikllari va mezbon organizmga ta'sirini tizimli tahlil qiladi. Asosiy e'tibor protozoa va gelmintlar (xususan, nematodalar) turlariga qaratilgan bo'lib, ularning morfologik, taksonomik va patogen xususiyatlari yoritiladi. Shuningdek, parazitlarning yuqish mexanizmlari, epidemiologik tarqalishi va chorvachilikdagi iqtisodiy ahamiyati ko'rib chiqiladi. Tadqiqot natijalari parazitlar kasalliklarni nazorat qilish bo'yicha mavjud strategiyalarni muhokama qiladi va kelajakdagi tadqiqot yo'nalishlari bo'yicha tavsiyalar beradi, xususan, O'zbekiston sharoitida.

Kalit so'zlar: Parazitlar, nematodalar, protozoa, koksidiyalar, hayvon salomatligi, epidemiologiya, kasalliklar.

Annotation. This chapter systematically analyzes the diversity of animal parasites, their biological characteristics, life cycles, and impact on host organisms. Primary focus is given to protozoa and helminths (particularly nematodes), elucidating their morphological, taxonomic, and pathogenic features. The study also examines parasite transmission mechanisms, epidemiological spread, and economic significance in livestock. Research findings discuss existing strategies for controlling parasitic diseases and provide recommendations for future research directions, especially within the context of Uzbekistan.

Key words: Parasites, nematodes, orotozoa, coccidia, animal health, epidemiology, diseases.

Аннотация. В данной главе систематически анализируется разнообразие паразитов, встречающихся у животных, их биологические особенности, жизненные циклы и влияние на организм хозяина. Основное внимание уделяется видам простейших и гельминтов (в частности, нематод), освещая их морфологические, таксономические и патогенные характеристики. Также рассматриваются механизмы передачи паразитов, их эпидемиологическое

распространение и экономическое значение в животноводстве. Результаты исследования обсуждают существующие стратегии контроля паразитарных заболеваний и дают рекомендации по направлениям будущих исследований, особенно в условиях Узбекистана.

Ключевые слова: Паразиты, нематоды, простейшие, кокцидии, здоровье животных, эпидемиология, заболевания.

Kirish. Hayvonlarda uchraydigan parazitlar global miqyosda chorvachilik, yovvoyi tabiat va hatto inson salomatligi uchun jiddiy tahdid hisoblanadi. Ular hayvonlarning mahsuldorligini pasaytirish, kasalliklarga chidamliligini zaiflashtirish va o'limga olib kelish orqali sezilarli iqtisodiy yo'qotishlarga sabab bo'ladi. Parazitizm - bu bir organizm (parazit) boshqa organizm (mezbon) hisobiga yashab, unga zarar yetkazadigan murakkab biologik munosabatdir.

Parazitologiya sohasidagi adabiyotlar hayvon parazitlarining keng spektrini qamrab oladi, ularning biologiyasi, ekologiyasi va patogenligini o'rganishga bag'ishlangan. Nazariy asos sifatida, parazitizm tushunchasi va parazit-mezbon munosabatlarining evolyutsion dinamikasi muhim ahamiyatga ega. Parazitlar mezbon organizmlar bilan birga evolyutsion yo'l bosib o'tgan bo'lib, bu ularning hayot sikllari va morfologik moslashuvlarida aks etadi.

Mavjud manbalar tahlili shuni ko'rsatadiki, hayvon parazitlari asosan uchta yirik guruhga bo'linadi: protozoa, gelmintlar va artropodlar. Nematodalar, gelmintlarning eng xilma-xil guruhlaridan biri sifatida, Strongylida, Ascaridida, Oxyurida, Rhabditida, Spirurida va Stichosomida kabi oltita asosiy tartibni o'z ichiga oladi. Ushbu tasnif nematodalarning genetik va morfologik xilma-xilligini aks ettiradi. Nematodalarning anatomik tuzilishi, jumladan, nayzasimon ovqat hazm qilish tizimi, turli og'iz tuzilmalari va jinsiy organlari ularning turlarini aniqlashda muhim ahamiyatga ega.

Protozoan parazitlar ham hayvonlar salomatligiga katta ta'sir ko'rsatadi.

Ushbu bob hayvonlarda uchraydigan parazitlar va ularning turlarini o'rganishga qaratilgan nazariy tadqiqot bo'lib, keng qamrovli adabiyotlar tahlili va sinteziga asoslanadi. Tadqiqotning asosiy yondashuvi mavjud ilmiy ma'lumotlarni to'plash, ularni kritik baholash va tizimli ravishda umumlashtirishdan iborat.

Ma'lumotlar manbalari: Tadqiqot uchun ma'lumotlar xalqaro ilmiy jurnallarda chop etilgan maqolalar, monografiyalar, xalqaro tashkilotlar hisobotlari va parazitologiya bo'yicha standart darsliklardan olingan. Xususan, ushbu bobni yozishda berilgan oltita asosiy manba asosiy dalil bazasi sifatida ishlatilgan.

Asosiy qisim. Hayvon parazitlari biologik xilma-xilligi, murakkab hayot sikllari va mezbon organizmlarga ko'rsatadigan patogen ta'siri bilan ajralib turadi. Ushbu bo'limda parazitlarning asosiy guruhleri, ularning xususiyatlari va ahamiyati batafsil tahlil qilinadi.

Parazitizm - bu evolyutsion jihatdan muvaffaqiyatli strategiya bo'lib, parazitlar deyarli barcha hayvon turlarini zararlay oladi. Ular asosan uchta yirik guruhga bo'linadi: Protozoa (bir hujayrali parazitlar), Gelmintlar (ko'p hujayrali chuvalchanglar) va Artropodlar (bo'g'imoyoqlilar, asosan ektoparazitlar). Har bir guruh o'ziga xos morfologik, fiziologik va hayot sikli xususiyatlariga ega.

Nematodalar gelmintlarning eng yirik va eng xilma-xil guruhlaridan biridir. Ular hayvonlarning turli organlarida, jumladan, oshqozon-ichak traktida, o'pkada, qon tomirlarida va terida parazitlik qiladi.

Tasnifi: Nematodalar oltita asosiy tartibga bo'linadi: Strongylida, Ascaridida, Oxyurida, Rhabditida, Spirurida va Stichosomida.

Strongylida: Bu tartib Trichostrongyloidea, Strongyloidea, Ancylostomatoidea va Metastrongyloidea kabi to'rtta superfamilani o'z ichiga oladi. Ular orasida Trichostrongylus, Haemonchus, Ostertagia, Strongylus va Ancylostoma kabi muhim jinslar mavjud. Strongyloidea superfamiliyasiga "kichik strongillar" yoki "siatostomalar" kiradi, ular bir nechta jinsdagi o'n beshta keng tarqalgan turni o'z ichiga oladi.

Ascaridida: Bu tartibga Ascaris va Toxocara kabi jinslar kiradi, ular asosan oshqozon-ichak traktida parazitlik qiladi.

Spirurida: Spirocerca, Thelazia va Dirofilaria kabi jinslar bu tartibga mansub bo'lib, ular turli to'qimalar va organlarda uchraydi.

Stichosomida: Trichinella va Trichuris kabi jinslar bu tartibning muhim vakillaridir.

Morfologiyasi: Nematodalar nayzasimon ovqat hazm qilish tizimiga ega. Ularning og'zi oddiy teshikdan tortib, tishli katta og'iz kapsulasigacha bo'lishi mumkin, bu ularning oziqlanish strategiyasini belgilaydi (shilliq qavat tiqinlarini, mezbon hazm mahsulotlarini yoki tana suyuqliklarini iste'mol qilish). Mushakli qizilo'ngach, ichak va ekskretor tizim ularning ichki tuzilishini tashkil etadi. Tashqi morfologiyada kutikulyar modifikatsiyalar, masalan, barg tojlari, bo'yin/dum papillalari, alalar va erkaklarda kopulyativ bursa (identifikatsiya uchun muhim) muhim rol o'ynaydi.

Ushbu bobda keltirilgan natijalar hayvon parazitlarining biologik xilma-xilligi, murakkab hayot sikllari va mezbon organizmlarga ko'rsatadigan keng qamrovli patogen ta'sirini yaqqol ko'rsatadi. Nematodalar va protozoalar, xususan, chorvachilikda eng muhim parazit guruhleri hisoblanadi, ularning tarqalishi va keltirib

chiqaradigan kasalliklari global miqyosda sezilarli iqtisodiy va ekologik oqibatlariga ega.

Tahlil shuni ko'rsatadiki, parazitlarning turlarini aniqlash, ularning morfologik xususiyatlarini tushunish va hayot sikllarini bilish samarali nazorat strategiyalarini ishlab chiqish uchun fundamental ahamiyatga ega. Epidemiologik tadqiqotlar, masalan, Gretsiyadagi qo'y va echki fermalarida o'tkazilgan ish, parazitlar tarqalishining real manzarasini ko'rsatadi va infeksiya rezervuarlari hamda risk omillarini aniqlashga yordam beradi. Bu ma'lumotlar fermerlarning xabardorligini oshirish va maqsadli profilaktika choralarini ko'rish uchun muhimdir.

Ushbu bobda keltirilgan ma'lumotlar cheklangan manbalarga asoslangan bo'lib, asosan gelmintlar va protozoalarga e'tibor qaratilgan.

Xulosa. Ushbu bob hayvonlarda uchraydigan parazitlarning keng qamrovli tahlilini taqdim etdi, ularning biologik xilma-xilligi, morfologik xususiyatlari, hayot sikllari va mezbon organizmlarga ko'rsatadigan patogen ta'sirini yoritdi. Asosiy e'tibor nematodalar va protozoalarga qaratilib, ularning taksonomik tasnifi, anatomik tuzilishi va epidemiologik ahamiyati batafsil ko'rib chiqildi.

Hayvon parazitlari protozoa, gelmintlar (xususan, nematodalar) va artropodlar kabi yirik guruhlariga bo'linadi, ularning har biri o'ziga xos xususiyatlarga ega.

Nematodalar Strongylida, Ascaridida, Spirurida kabi tartiblarni o'z ichiga olgan holda juda xilma-xil bo'lib, ularning morfologik tuzilishi (og'iz kapsulasi, qizilo'ngach, jinsiy organlar) turlarni aniqlashda muhimdir.

Protozoan parazitlar, jumladan Cryptosporidium, Leishmania, Neospora va Eimeria, turli mezbonlarda (itlar, qoramollar, qo'ylar, echkilar) keng tarqalgan bo'lib, oshqozon-ichak, nevrologik va reproduktiv kasalliklarni keltirib chiqaradi.

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TOG‘AYLI BALIQLAR MAVZUSINI O‘QITISHDA ZAMONAVIY METODLAR

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Annotatsiya. Ushbu bobda tog‘ayli baliqlar (Chondrichthyes) mavzusini o‘qitishda zamonaviy pedagogik metodlarning ahamiyati va samaradorligi tahlil qilinadi. An‘anaviy yondashuvlarning cheklovlari ko‘rib chiqilib, STEAM integratsiyasi, loyihaga asoslangan ta’lim (PBL), interaktiv usullar va axborot texnologiyalari kabi innovatsion metodlarning biologiya ta’limidagi o‘rni o‘rganiladi. Tadqiqotlar natijalari asosida zamonaviy metodlarning o‘quvchilarning bilim o‘zlashtirish darajasi, faolligi va 21-asr ko‘nikmalarini rivojlantirishdagi ijobiy ta’siri ko‘rsatiladi. Shuningdek, faol o‘qitish strategiyalari va akademik ko‘rsatkichlar o‘rtasidagi munosabatlarga oid tanqidiy tahlil ham keltirilgan. Bob yakunida tog‘ayli baliqlar ta’limini takomillashtirish bo‘yicha amaliy tavsiyalar beriladi.

Kalit so‘zlar: Tog‘ayli baliqlar, Zamonaviy metodlar, STEAM, Loyihaga asoslangan ta’lim, Interaktiv ta’lim, Biologiya ta’limi, O‘zbekiston, Baliqchilik

Annotation. This chapter analyzes the significance and effectiveness of modern pedagogical methods in teaching the topic of cartilaginous fish (Chondrichthyes). It examines the limitations of traditional approaches and explores the role of innovative methods such as STEAM integration, Project-Based Learning (PBL), interactive techniques, and information technologies in biology education. Based on research findings, the positive impact of modern methods on students' knowledge acquisition, engagement, and 21st-century skill development is demonstrated. A critical analysis of the relationship between active learning strategies and academic performance is also presented. The chapter concludes with practical recommendations for improving the education of cartilaginous fish.

Key words: Cartilaginous fish, Modern methods, STEAM, Project-Based Learning, Interactive learning, Biology education, Uzbekistan, Fisheries

Аннотация. В данной главе анализируется значимость и эффективность современных педагогических методов в преподавании темы хрящевых рыб (Chondrichthyes). Рассматриваются ограничения традиционных подходов и исследуется роль инновационных методов, таких как интеграция STEAM, проектное обучение (PBL), интерактивные методы и информационные технологии в биологическом образовании. На основе результатов исследований показано положительное влияние современных методов на уровень усвоения знаний учащимися, их активность и развитие навыков XXI века. Также представлен критический анализ взаимосвязи между стратегиями активного обучения и академическими показателями. В заключение главы даются практические рекомендации по совершенствованию обучения хрящевым рыбам.

Ключевые слова: Хрящевые рыбы, Современные методы, STEAM, Проектное обучение, Интерактивное обучение, Биологическое образование, Узбекистан, Рыболовство

Kirish. Tog‘ayli baliqlar (Chondrichthyes) biologik xilma-xillikning muhim qismi bo‘lib, ekologik tizimlarda, ayniqsa dengiz muhitida, hal qiluvchi rol o‘ynaydi. Ularning noyob anatomik, fiziologik va ekologik xususiyatlari, shuningdek, evolyutsion ahamiyati biologiya ta’limida chuqur o‘rganilishi lozim bo‘lgan murakkab mavzulardan biridir. O‘zbekistonda baliqchilik sanoatining jadal rivojlanishi, jumladan, forel, osyotr va losos kabi yangi turlarni mahalliy sharoitda yetishtirishga qaratilgan sa’y-harakatlar, ushbu sohada malakali mutaxassislarga bo‘lgan ehtiyojni oshirmoqda. Bu esa biologiya ta’limida, xususan ixtiologiya yo‘nalishida, zamonaviy va samarali o‘qitish metodlarini joriy etishni taqozo etadi.

Asosiy qism. Tog‘ayli baliqlar (Chondrichthyes) sinfi umurtqali hayvonlar bo‘lib, ularning skeleti tog‘aydan iborat, terisi plakoid tangachalar bilan qoplangan yoki tangachasiz bo‘ladi. Ular jabra qopqoqlariga ega emas va suzish pufagi yo‘q. Ichki urug‘lanish, tirik tug‘ish, tuxumdan tirik tug‘ish yoki tuxum qo‘yish orqali ko‘payadi. Bu murakkab biologik xususiyatlarni o‘quvchilarga samarali yetkazish chuqur tushunishni talab qiladi.

Biologiya ta’limida an’anaviy "tushuntirish-mustahkamlash" modeli ko‘pincha o‘quvchilarning mavzuga bo‘lgan qiziqishini pasaytirib, ularning faol ishtirokini cheklaydi. Abdurasulova K.G. ta’kidlaganidek, ta’lim sohasidagi islohotlar, jumladan, innovatsion texnologiyalarni joriy etish jamiyat taraqqiyoti uchun muhimdir.

O‘zbekiston hukumati tomonidan ta’lim sohasini rivojlantirishga qaratilgan ko‘plab farmon va qarorlar qabul qilingani zamonaviy metodlarga o‘tish zaruratini ko‘rsatadi.

Ushbu bob tog‘ayli baliqlar mavzusini o‘qitishda zamonaviy metodlarning samaradorligini tahlil qilishga qaratilgan nazariy va analitik tadqiqot hisoblanadi. Tadqiqot yondashuvi mavjud ilmiy adabiyotlarni, pedagogik nazariyalarni va amaliy tajribalarni tanqidiy tahlil qilish va sintez qilishga asoslangan.

Ma’lumotlar manbalari sifatida biologiya ta’limida zamonaviy usullar va texnologiyalardan foydalanish tajribasi, biologiya ta’limini takomillashtirish metodologiyalari, O‘zbekiston baliqchilik sanoatining rivojlanishi, Baliqchilik ilmiy-tadqiqot institutining ilmiy yutuqlari, tog‘ayli baliqlarning biologik xususiyatlari hamda faol o‘qitish strategiyalari va akademik ko‘rsatkichlar o‘rtasidagi bog‘liqlikni o‘rganuvchi korrelyatsion tadqiqot kabi manbalardan foydalanildi.

Mavzuni aniqlash va muammoni belgilash: Tog‘ayli baliqlar mavzusini o‘qitishdagi an’anaviy yondashuvlarning cheklovlari va zamonaviy metodlarga bo‘lgan ehtiyoj aniqlandi.

Tog‘ayli baliqlar mavzusini o‘qitishda zamonaviy metodlarni qo‘llash o‘quvchilarning mavzuni chuqur o‘zlashtirishiga va 21-asr ko‘nikmalarini rivojlantirishiga sezilarli hissa qo‘shishi mumkin. "Biologiyani o‘qitishda zamonaviy usullar va texnologiyalardan foydalanish tajribasi" nomli maqolada keltirilgan eksperimental natijalar shuni ko‘rsatadiki, STEAM integratsiyasi, PBL va interaktiv usullarni o‘z ichiga olgan kombinatsiyalangan yondashuv an’anaviy usullarga nisbatan yuqori natijalar bergan. Tajriba guruhidagi o‘quvchilar mavzuni sezilarli darajada yaxshi o‘zlashtirgan, o‘quv faolligi oshgan va murakkab vaziyatlarni tahlil qilish, ilmiy argumentatsiya qilish kompetensiyalari mustahkamlangan.

Tog‘ayli baliqlarning murakkab anatomik tuzilishi (tog‘ay skeleti, jabra yoriqlari, suzish pufagining yo‘qligi, ichakdagi spiral klapan) kabi mavzularni o‘qitishda axborot texnologiyalari juda samarali bo‘lishi mumkin. Masalan, 3D modellar, virtual reallik (VR) ilovalari yoki animatsiyalar orqali tog‘ayli baliqlarning ichki va tashqi tuzilishini vizualizatsiya qilish o‘quvchilarning tushunishini sezilarli darajada oshiradi. Abdurasulova K.G. ta’kidlaganidek, axborot texnologiyalari ta’limiy, vizual va rivojlantiruvchi funksiyalarni bajaradi.

Loyiha asosidagi ta’lim (PBL) orqali o‘quvchilarga tog‘ayli baliqlarning ekologik roli, ularning populyatsiyalariga tahdidlar (masalan, ortiqcha ovlash) yoki ularni saqlash strategiyalari bo‘yicha loyihalar berish mumkin. Bu o‘quvchilarni muammoli vaziyatlarni hal qilishga, tadqiqot o‘tkazishga va ijodiy yechimlar topishga undaydi.

Tadqiqot natijalari shuni ko'rsatadiki, tog'ayli baliqlar mavzusini o'qitishda zamonaviy metodlar o'quvchilarning bilim o'zlashtirish darajasini, faolligini va kompetensiyalarini sezilarli darajada oshiradi. Biroq, faol o'qitish strategiyalarining akademik ko'rsatkichlarga bevosita statistik ahamiyatli ta'siri har doim ham kuzatilmaslgi mumkin. Bu holat, zamonaviy metodlarni joriy etishda faqatgina test natijalariga e'tibor qaratmasdan, balki o'quvchilarning tanqidiy fikrlash, muammolarni hal qilish, ijodkorlik va hamkorlik kabi ko'nikmalarini rivojlantirishga ham ustuvor ahamiyat berish kerakligini ko'rsatadi.

Integratsiyalashgan o'quv dasturlarini ishlab chiqish: Tog'ayli baliqlar mavzusini o'qitishda STEAM (fan, texnologiya, muhandislik, san'at, matematika) yondashuvini integratsiyalash. Masalan, tog'ayli baliqlarning gidrodinamikasi bo'yicha muhandislik loyihalari yoki ularning rang-barangligi bo'yicha san'at loyihalari.

Loyihaga asoslangan ta'limni kengaytirish: O'quvchilarga tog'ayli baliqlarning biologiyasi, ekologiyasi, saqlanishi yoki ularni sun'iy sharoitda yetishtirish bo'yicha tadqiqot loyihalarini berish. Bu ularni mustaqil izlanishga va amaliy ko'nikmalarni egallashga undaydi.

Axborot texnologiyalaridan faol foydalanish: Tog'ayli baliqlarning anatomik tuzilishini, hayot siklini va tarqalishini o'rganishda 3D modellar, virtual laboratoriyalar, interaktiv simulyatsiyalar va videodarsliklardan foydalanish.

Xulosa. Ushbu bobda tog'ayli baliqlar mavzusini o'qitishda zamonaviy pedagogik metodlarning ahamiyati va samaradorligi atroflicha tahlil qilindi. An'anaviy yondashuvlarning cheklovlari mavjudligi va 21-asr ko'nikmalarini rivojlantirish zarurati zamonaviy metodlarga o'tishni taqozo etadi. STEAM integratsiyasi, loyihaga asoslangan ta'lim, interaktiv usullar va axborot texnologiyalari kabi yondashuvlar o'quvchilarning bilim o'zlashtirish darajasini, faolligini va kompetensiyalarini sezilarli darajada oshirishi eksperimental tadqiqotlar orqali tasdiqlangan. Bu metodlar murakkab biologik tushunchalarni vizualizatsiya qilish, muammoli vaziyatlarni hal qilish va ijodiy fikrlashni rag'batlantirishda muhim rol o'ynaydi.

Biroq, faol o'qitish strategiyalarining akademik ko'rsatkichlarga bevosita statistik ahamiyatli ta'siri har doim ham kuzatilmaslgi mumkinligi haqidagi topilma muhim cheklovni ko'rsatadi.

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QUSHLARDA UCHRAYDIGAN PARAZITLAR VA ULARNING ZARARI

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Annotatsiya. Ushbu bob qushlarda uchraydigan parazitlarning epidemiologiyasi, patologik ta'sirlari va nazorat strategiyalarini chuqur tahlil qiladi. Mavjud ilmiy adabiyotlar asosida, endoparazitlar (masalan, koksidiyalar, nematodalar, tasmasimon chuvalchanglar, gemosporidiy protozoalar) va ektoparazitlar (bitlar, kanalar) ning tarqalish darajasi, turlari va ularning qushlar salomatligiga ta'siri ko'rib chiqiladi. Tadqiqotlar shuni ko'rsatadiki, parazit infeksiyalari qushlarning omon qolishi, ko'payish muvaffaqiyati va migratsiya xulq-atvoriga jiddiy ta'sir ko'rsatadi, shuningdek, zoonotik xavf tug'dirishi mumkin. Diagnostika usullari va nazorat choralari muhokama qilinadi, global o'zgarishlarning parazit-mezbon o'zaro ta'siriga ta'siri ta'kidlanadi. Ushbu tahlil qushlar salomatligini himoya qilish va tabiatni muhofaza qilish dasturlari uchun muhim ahamiyatga ega.

Kalit so'zlar: qush parazitlari, endoparazitlar, ektoparazitlar, zoonozlar, epidemiologiya, patologiya, diagnostika, nazorat.

Annotation. This chapter deeply analyzes the epidemiology, pathological effects, and control strategies of parasites in birds. Based on existing scientific literature, the prevalence, types, and impact on bird health of endoparasites (e.g., coccidia, nematodes, cestodes, haemosporidian protozoa) and ectoparasites (lice, mites) are examined. Studies indicate that parasitic infections significantly affect bird survival, reproductive success, and migratory behavior, potentially posing zoonotic risks. Diagnostic methods and control measures are discussed, emphasizing the influence of global changes on parasite-host interactions. This analysis is crucial for avian health protection and conservation programs.

Key words: avian parasites, endoparasites, ectoparasites, zoonoses, epidemiology, pathology, diagnostics, control.

Аннотация. В данной главе глубоко анализируются эпидемиология, патологические воздействия и стратегии контроля паразитов у птиц. На основе существующей научной литературы рассматриваются распространенность, виды и влияние на здоровье птиц эндопаразитов (например, кокцидии, нематоды,

цестоды, гемоспоридийные простейшие) и эктопаразитов (вши, клещи). Исследования показывают, что паразитарные инфекции серьезно влияют на выживаемость птиц, успех размножения и миграционное поведение, а также могут представлять зоонозный риск. Обсуждаются методы диагностики и меры контроля, подчеркивается влияние глобальных изменений на взаимодействие паразит-хозяин. Этот анализ имеет важное значение для программ по защите здоровья птиц и сохранению природы.

Ключевые слова: паразиты птиц, эндопаразиты, эктопаразиты, зоонозы, эпидемиология, патология, диагностика, контроль.

Kirish. Qushlar ekotizimlarning ajralmas qismi bo'lib, ularning salomatligi biologik xilma-xillik va ekologik barqarorlik uchun katta ahamiyatga ega. Biroq, qushlar turli xil parazitlar, jumladan, endoparazitlar (ichki parazitlar) va ektoparazitlar (tashqi parazitlar) tomonidan doimiy tahdid ostida bo'ladi. Bu parazitlar qushlarning fiziologik holatiga, xulq-atvoriga, ko'payish qobiliyatiga va omon qolish darajasiga sezilarli darajada salbiy ta'sir ko'rsatishi mumkin. Bundan tashqari, ayrim qush parazitlari zoonotik xususiyatga ega bo'lib, inson salomatligi uchun ham xavf tug'dirishi mumkin.

Asosiy qism. Qush parazitlari muammosi uzoq vaqtdan beri veterinariya parazitologiyasi va yovvoyi tabiat biologiyasining diqqat markazida bo'lib kelgan. Nazariy jihatdan, parazitizm – bu bir organizm (parazit) boshqa organizm (mezbon) hisobiga yashaydigan va unga zarar yetkazadigan simbiotik munosabatdir. Qushlarda parazitlar ikki asosiy guruhga bo'linadi: endoparazitlar (ichki organlarda yashovchilar) va ektoparazitlar (tashqi yuzada yashovchilar). Bu parazitlarning mavjudligi qushlarning immunitet tizimiga, energiya balansiga va xulq-atvoriga ta'sir ko'rsatib, ularning yashash qobiliyatini pasaytiradi.

So'nggi yillarda o'tkazilgan tadqiqotlar qush parazitlarining tarqalishi va xilma-xilligi haqida muhim ma'lumotlarni taqdim etdi. Serbiyadagi uchta hayvonot bog'ida 2015-2016 yillarda o'tkazilgan tadqiqotda 112 turdagi 318 ta qushning najas namunalari tekshirilgan. Natijalar shuni ko'rsatdiki, endoparazitlarning umumiy tarqalish darajasi Belgradda 51.96%, Palichda 46.16% va Borda 16.66% ni tashkil etgan. Aniqlangan parazitlar orasida koksidiy ootsistlari, Capillaria spp, Heterakis spp, Trichostrongylus spp, Ascaridia spp tuxumlari, Syngamus trachea va noma'lum trematodalar bo'lgan. Tasmasimon chuvalchanglar aniqlanmagan. Tadqiqot joyiga qarab koksidiyalar (8.33-32.84%), kapillyarioz (2.77-29.41%), geterakioz (2.56-12.74%), trixostrogilidoz (5.55-25.64%) va askaridoz (10.25-10.78%) tarqalish darajasi turlicha bo'lgan. Shuningdek, ikki yoki uch turdagi parazitlar bilan qo'shma infeksiyalar Belgrad va

Palichda, to'rt turdagi infeksiyalar esa Belgradda qayd etilgan. Bu topilmalar yo'qolib ketish xavfi ostidagi qush turlarini himoya qilish dasturlari uchun qimmatli hisoblanadi.

Hindistonning Ludhiana shahrida o'tkazilgan boshqa bir tadqiqotda yovvoyi qushlarning zoonotik kasalliklar tashuvchisi sifatidagi potentsiali e'tiborga olingan holda, uy qarg'alarida (*Corvus splendens*) endoparazitlarning tarqalishi o'rganilgan.

Ushbu bobda qush parazitlari bo'yicha mavjud ilmiy bilimlarni sintez qilish va tanqidiy baholashga qaratilgan tizimli adabiyotlar sharhi yondashuvi qo'llaniladi. Tadqiqotning asosiy maqsadi turli tadqiqotlardan olingan ma'lumotlarni birlashtirish orqali qush parazitlarining tarqalishi, patologik ta'sirlari, epidemiologik xususiyatlari va nazorat strategiyalari haqida keng qamrovli tushuncha berishdir.

Tadqiqot yondashuvi: Ushbu tadqiqotda sifatli sintez usuli qo'llaniladi. Bu yondashuv turli empirik tadqiqotlardan olingan ma'lumotlarni to'plash, ularni tahlil qilish va umumlashtirishni o'z ichiga oladi. Asosiy e'tibor umumiy mavzularni, farqlarni va muhim topilmalarni aniqlashga qaratilgan bo'lib, bu orqali mavzuga oid chuqur tushuncha shakllantiriladi.

Ma'lumotlar manbalari: Ma'lumotlar manbalari sifatida qush parazitlarining tarqalishi, identifikatsiyasi, patologik ta'sirlari va epidemiologik jihatlariga bag'ishlangan, ekspertlar tomonidan ko'rib chiqilgan ilmiy maqolalar xizmat qiladi.

Qushlarda uchraydigan parazitlar global miqyosda keng tarqalgan va xilma-xil bo'lib, turli qush populyatsiyalarining salomatligi va omon qolishiga jiddiy ta'sir ko'rsatadi. Tahlil qilingan tadqiqotlar shuni ko'rsatadiki, parazit infeksiyalarining tarqalish darajasi qush turiga, yashash muhitiga va geografik joylashuvga qarab sezilarli darajada farq qiladi. Hayvonot bog'i qushlarida, yovvoyi qushlarda va uy parrandalarida aniqlangan parazit turlarining xilma-xilligi (nematodalar, protozoalar, bitlar, kanalar) parazit-mezbon o'zaro ta'sirining murakkabligini aks ettiradi.

Parazitlarning patologik ta'sirlari qushlarning umumiy holatining yomonlashishidan tortib, jiddiy klinik belgilar (ozish, patlarning dag'allashishi, yarali shikastlanishlar, oqsoqlik) va hatto o'limga olib kelishi mumkin. Ayniqsa, *Knemidocoptes mutans* kabi kanalar keltirib chiqaradigan oyoq shikastlanishlari qushlarning harakatlanish qobiliyatini cheklab, ularning oziqlanishi va yirtqichlardan qochish imkoniyatini pasaytiradi. Qo'shma infeksiyalar esa bu ta'sirlarni yanada kuchaytirishi mumkin.

Qushlarning zoonotik kasalliklar tashuvchisi sifatidagi roli, ayniqsa yovvoyi qushlar populyatsiyalarida, jamoat salomatligi uchun muhim ahamiyatga ega.

Xulosa. Ushbu bob qushlarda uchraydigan parazitlarning keng tarqalganligi, ularning xilma-xilligi va qushlar salomatligi, ekologik barqarorlik hamda jamoat salomatligi

uchun jiddiy oqibatlarga ega ekanligini ko'rsatdi. Endoparazitlar va ektoparazitlar qushlarning omon qolishi, ko'payishi va xulq-atvoriga salbiy ta'sir ko'rsatib, ularda ozish, patologik shikastlanishlar va ikkilamchi infeksiyalarni keltirib chiqaradi. Yovvoyi qushlarning zoonotik patogenlar uchun rezervuar bo'lishi va ektoparazitlarning kasallik tashuvchisi sifatidagi roli inson salomatligi uchun ham xavf tug'diradi. Global o'zgarishlar parazitlarning tarqalishini va mezbon-parazit o'zaro ta'sirini murakkablashtirmoqda.

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AMMIK GAZINI ANIQLOVCHI SENSORLARNI TIZIMLI TAHLIL QILISH VA SOLISHTIRISH

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Annotatsiya. Ushbu maqoladada ammiak (NH_3) gazini yuqori sezuvchanlik bilan aniqlashga mo'ljallangan optik sensor ishlab chiqishning dastlabki bosqichi — adabiyotlar tahlili va sensor tamoyilini tanlash — yoritilgan. Maqsad: elektrokimyoviy, MOS va optik sensor texnologiyalarini solishtirish, optik usulning ustunliklarini asoslash hamda keyingi eksperimental bosqich uchun tayanch qoidalarni shakllantirish. Tahlil natijalari NDIR va TDLAS texnologiyalarining ammiak monitoringi uchun optimal ekanligini ko'rsatdi.

Kalit so'zlar: ammiak sensori, optik detektor, NDIR, infraqizil spektroskopiya, Beer-Lambert qonuni, sezuvchanlik, LOD, selektivlik, gaz monitoringi.

Kirish

Ammiak (NH_3) zamonaviy sanoat, qishloq xo'jaligi va ekologiya nazoratining ajralmas qismiga aylangan. Dunyo bo'yicha yillik ishlab chiqarish 175 million tonnadan oshib, asosan azotli o'g'itlar uchun sarflanmoqda. Shu bilan birga, ushbu gaz yuqori toksikligiga ega: OSHA standarti bo'yicha ish joyi uchun ruxsat etilgan chegaraviy konsentratsiya 25 ppm (TWA) ni tashkil etadi, 300 ppm da esa o'tkir nafas yo'llari zarari kuzatiladi.

Qishloq xo'jaligi ob'ektlari, kimyo va sovutish sanoatida real vaqtli, ishonchli va arzon NH_3 monitoring tizimiga ehtiyoj keskin o'smoqda. Mavjud elektrokimyoviy sensorlar qisqa xizmat muddati va past selektivligi bilan cheklangan bo'lsa, optik sensorlar ushbu kamchiliklarni bartaraf etishda yangi imkoniyatlar taqdim etmoqda. Ushbu tadqiqot shu yo'nalishdagi dastlabki bosqich — adabiyotlar tahlili va sensor tamoyilini asoslash — natijalarini o'z ichiga oladi.

Adabiyotlar tahlili Scopus, Web of Science va Google Scholar ma'lumotlar bazalarida 2015–2024 yillar oralig'ida chop etilgan ilmiy maqolalar asosida amalga oshirildi. Qidiruv kalitlari: "ammonia optical sensor", " NH_3 NDIR", "TDLAS ammonia", "photoacoustic gas detection". Tanlanma mezonlari: NH_3 ga yo'naltirilgan sensor tizimi, eksperimental LOD ko'rsatkichi mavjudligi, peer-reviewed jurnal. Texnologiyalarni solishtirish uchun quyidagi ko'rsatkichlar asosiy mezon sifatida

qabul qilindi: aniqlash chegarasi (LOD), dinamik diapazon, javob vaqti (t_{90}), selektivlik, xizmat muddati va narx darajasi. Ushbu mezonlar bo'yicha tartiblash matritsasi tuzildi.

Tadqiqot ishining bajarilishi. Ammiak gazini 0–500 ppm diapazonida, aniqlash chegarasi ≤ 1 ppm bo'lgan, selektiv va uzoq muddatli barqaror optik sensorni ishlab chiqish hamda uning metrologik xususiyatlarini eksperimental tadqiq qilish asosiy maqsad hisoblanadi. Dastlabki bosqich uchun quyidagi vazifalari belgilab olindi:

1. NH_3 sensorlash texnologiyalarini tizimli tahlil qilish va solishtirish;
2. Optik aniqlash usulining fizik asoslarini (Beer-Lambert qonuni, IR absorbsiya) o'rganish;
3. Sensor uchun optimal nurlanish manbasini, gaz kamerasini va detektor turini asoslash;
4. Keyingi eksperimental bosqich uchun texnik talablar ro'yxatini tuzish.

Olingan natijalar tahlili

Tahlil natijasida sensor texnologiyalarining solishtirmali jadvali tuzildi:

Sensor turi	LOD (ppm)	Javob vaqti	Asosiy kamchilik
Elektrokimyoviy	1–5	30–60 s	Qisqa xizmat muddati
Metal-oksid (MOS)	1–50	5–30 s	Past selektivlik
NDIR optik	0.5–2	< 10 s	Filtr aniqligiga bog'liq
TDLAS lazerli	0.01–0.1	< 1 s	Yuqori narx
Fotoakustik (PAS)	0.05–0.5	1–5 s	Akustik shovqinga sezgir

Jadval tahlili shuni ko'rsatadiki, TDLAS (Tunable Diode Laser Absorption Spectroscopy) va NDIR (Non-Dispersive Infrared) texnologiyalari LOD va selektivlik bo'yicha boshqa usullarga nisbatan sezilarli ustunlikka ega. Xususan:

- NDIR sensorlari 0.5–2 ppm LOD ta'minlab, ishlab chiqarish narxi nisbatan past (50–300 USD). Oddiy konstruktsiyasi va uzoq xizmat muddati (> 10 yil) sanoat monitoringi uchun ideal.
- TDLAS 0.01–0.1 ppm darajasida LOD ta'minlaydi va bitta absorbsiya chizig'iga sozlanib, H_2O , CO_2 interferentsiyasini to'liq bartaraf etadi. 1531.68 nm to'liq uzunligi NH_3 uchun eng selektiv nuqta ekanligi aniqlandi.

- Fotoakustik sensorlar (PAS) laboratoriya sharoitida ppb darajasidagi LOD ko‘rsatgan, lekin sanoat muhitida akustik shovqin va mexanik tebranishlar muammo tug‘diradi.
- Elektrokimyoviy va MOS sensorlar arzonligi bilan ajralib tursa ham, selektivlik va xizmat muddati bo‘yicha optik usullardan orqada qolmoqda. Beer-Lambert qonuni tahlili asosida sensitivlikni oshirish uchun optik yo‘l uzunligini $L = 5\text{--}20$ sm dan ko‘p marta aks ettirishli Herriott kamerasi yordamida 1–10 m gacha oshirish tavsiya etiladi. Bu LOD ni 5–10 baravar yaxshilash imkonini beradi.

Xulosa

Optik sensorlar — xususan NDIR va TDLAS — ammiak gazini aniqlash uchun eng istiqbolli texnologiya hisoblanadi. Sensor uchun asosiy texnik talablar belgilandi: LOD ≤ 1 ppm, diapazon 0–500 ppm, javob vaqti ≤ 30 s, xizmat muddati ≥ 5 yil. Keyingi bosqichda optik sxema loyihalash, PCB tayyorlash va gaz kamerasini 3D bosib chiqarish rejalashtirilgan.

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VIDEO-TASVIRLARDA HARAKATDAGI OBYEKTЛАRNI ANIQLASHNING INTELLEKTUAL TIZIMINI ISHLAB CHIQISH

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Annotatsiya. Ushbu maqolada video oqimlarda harakatdagi obyektlarni aniqlash va kuzatish uchun zamonaviy intellektual tizim arxitekturasini taklif etiladi. Maqola YOLO, Faster/Mask R-CNN, SSD, DETR kabi detektorlar hamda SORT/DeepSORT, FairMOT, ByteTrack singari ko'p obyektli kuzatuv (MOT) usullari tahliliga tayangan holda, real vaqt talablari (FPS), aniqlik ko'rsatkichlari (mAP, IDF1) va resurs cheklovlari o'rtasidagi muvozanatni yoritadi. Shuningdek, O'zbekistonda yo'l harakatini monitoring qilish bo'yicha nashrlardan amaliy misollar keltiriladi.

Kalit so'zlar: Kompyuter ko'rish, obyekt aniqlash, ko'p obyektli kuzatuv, YOLO, DETR, SORT, ByteTrack, FairMOT, MOTChallenge, real vaqt.

1. Kirish. Raqamli videokuzatuv va IoT qurilmalari sonining keskin ortishi natijasida yo'l harakati, xavfsizlik, sanoat va sport analitikasi kabi sohalarda harakatdagi obyektlarni aniqlash va kuzatish muammosi dolzarb tus olgan. Maqsad — past kechikish bilan yuqori aniqlikni ta'minlaydigan, modullashtirilgan va kengaytiriladigan tizim yaratish.

2. Bog'liq ishlar: adabiyotlar tahlili.

2.1. Detektorlar evolyutsiyasi

YOLO birinchi avlod usuli obyekt aniqlashni yakka tarmoq regressiya vazifasi sifatida qo'yib, real vaqtda 45+ FPS ko'rsatkichiga erishgan, ammo lokalizatsiya xatolari nisbatan ko'p bo'lgan [1]. Faster R-CNN mintaqa taklif qilish tarmog'i (RPN) orqali aniqlikni oshirgan, biroq hisoblash murakkabligi tufayli FPS past bo'lib qolgan [2, 9]. SSD ko'p o'lchamli xususiyat xaritalari va 'default box'lar orqali bir bosqichli aniqlashni tez va raqobatbardosh aniqlik bilan ta'minlagan [3, 6, 14]. Mask R-CNN esa deteksiyaga instansiya segmentatsiya tarmog'ini qo'shib, COCO yo'nalishlarida yetakchi natijalarni ko'rsatgan [4, 7]. Transformeriga asoslangan DETR qoida asosidagi NMS va ankorga bog'liqlikni olib tashlab, to'plam-prognozlash (set prediction) va bipartit moslashtirish orqali soddalashtirilgan pipeline taklif qiladi [16, 20]. So'nggi yillarda YOLOv7 [17, 21] va YOLOv8 [18, 22, 24] real vaqt rejimida aniqlik-tezlik muvozanatini yanada yaxshiladi.

2.2. Ko'p obyektli kuzatuv (MOT).

SORT Kalman filtri va Vengercha (Hungarian) moslashtirish asosida juda tez ishlaydigan onlayn kuzatuvni ta'minlaydi [10, 13]. Deep SORT ko'rinish (appearance) embeddinglari bilan ID almashinishlarni keskin kamaytiradi [5, 19]. FairMOT deteksiya va re-ID ni yagona, adolatli ko'p-vazifali tarmoqda birlashtiradi [7]. ByteTrack past baholangan deteksiya qutillarini ham assotsiatsiyaga jalb qilib, MOT17 va MOT20 setlarida MOTA/IDF1 bo'yicha SOTA natijalarni qayd etadi [6, 8, 11, 12]. Yaqinda sport sahnalariga moslashtirilgan HM-SORT kabi variantlar ham taklif qilinmoqda [15].

2.3. Benchmarklar va metrikalar

MOTChallenge (MOT15/16/17/20) kuzatuv usullarini standart baholash uchun keng qo'llanadi; ayniqsa MOT20 juda gavjum sahnalarni o'z ichiga oladi [23, 25, 26]. Detektorlar uchun COCO va VOC mAP; kuzatuv uchun MOTA, IDF1, HOTA va ID-switch ko'rsatkichlari ishlatiladi.

2.4. O'zbekistonda amaliy tadqiqotlar

Toshkent sharoitida real vaqt transport oqimini hisoblash va monitoring qilishga bag'ishlangan tadqiqotlar, masalan, Sensors jurnalida chop etilgan ishda, deteksiya va kuzatuv integratsiyasi orqali tirbandlikni kamaytirish maqsad qilingan [27, 29]. Shuningdek, mahalliy mualliflar tomonidan yo'l harakati va video-kuzatuvga doir ishlanmalar ham uchraydi [30–32].

3. Taklif etilayotgan tizim arxitekturas

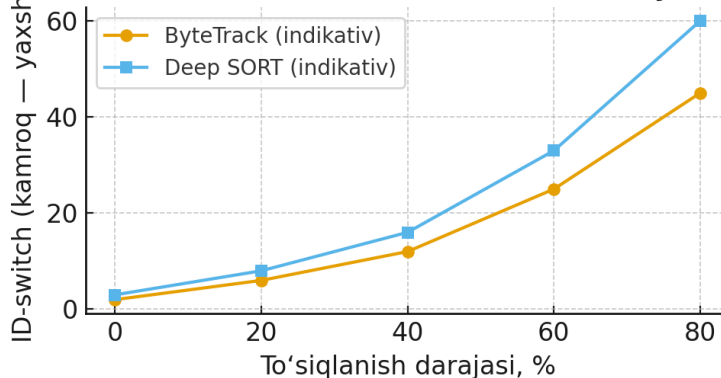
Tizim pipeline'i: (i) Kadrlarni olish va oldindan ishlov; (ii) Detektor (YOLOv8 yoki YOLOv7/SSD) orqali obyektlarni aniqlash; (iii) MOT moduli (ByteTrack yoki Deep SORT) orqali identifikatsiya va trayektoriya yangilash; (iv) Analitika (hisoblash, zonalar bo'yicha oqim, qoidabuzarliklar). Edge qurilmalar uchun yengil modellar (YOLO-Nano/YOLOv8n) qo'llanadi, markaziy serverda esa ko'proq aniqlik talab qiluvchi modellar ishga tushiriladi.

Video kadrlar → Oldindan ishlov → Detektor (YOLOv8/YOLOv7/SSD) → Kuzatuv (ByteTrack/DeepSORT) → Analitika

4. Eksperimental dizayn va muhokama (konseptual)

Maqsad — real vaqt (≥ 25 FPS) va barqaror IDF1 ni ta'minlash. Detektor tanlovi sahna murakkabligiga bog'liq: oddiy sahnalar uchun YOLOv8n/s, murakkab sahnalar uchun YOLOv8m/l yoki YOLOv7. Kuzatuvda ByteTrack occlusion holatlarida ham deteksiya qutillarini to'liqroq hisobga olib, ID-switch'larni kamaytirishga yordam beradi [11, 12].

Occlusion oshishi bilan ID-switch tendensiyasi (shema)



Eslatma: grafik indikativ bo'lib, umumiy tendensiyani ko'rsatadi. Aniq raqamlar ma'lum bir model, dataset va apparatga bog'liq ravishda o'zgaradi.

5. Amaliy qo'llanma

- Chegaraviy qurilmalar (edge) uchun: YOLOv8n/s + ByteTrack; 720p@25–30 FPS.
- GPU serverlarida: YOLOv8m/l yoki YOLOv7 + ByteTrack/DeepSORT; 1080p@30 FPS.
- Monitoring: zonalar, hisoblagichlar, qoidabuzarliklar (masalan, taqiqlangan zona), issiqlik xaritalari.
- Modelni moslashtirish: sinflar soni, aniq sahna sharoitlari (tun/ob-havo) uchun finetune.

6. Xulosa

Deteksiya va kuzatuv modullarini to'g'ri juftlash real vaqt tizimlarida barqaror ishlashni ta'minlaydi. YOLOv7/YOLOv8 kabi zamonaviy detektorlar ByteTrack/FairMOT bilan birga gavjum sahnalarda yuqori IDF1 ko'rsatish imkonini beradi. Kelgusida transformer-asosli detektorlar (DETR va uning variantlari) va self-supervised pre-treninglar balansini o'rganish maqsadga muvofiq.

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STUDY OF AUTOMOTIVE TERMINOLOGY IN MODERN CHINESE IN WORLD AND UZBEK LINGUISTICS

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Annotation

This article analyzes the formation, stages of development, and linguistic features of automotive terminology in modern Chinese. It also comparatively examines scientific research conducted in this field in world and Uzbek linguistics. Methods of term formation, translation problems, and semantic features are scientifically explained.

Key words: terminology, automotive field, Chinese language, technical terms, translation, linguistics, globalization, lexicology

Annotatsiya

Mazkur maqolada hozirgi xitoy tilida avtomobil sohasi terminologiyasining shakllanishi, rivojlanish bosqichlari hamda lingvistik xususiyatlari tahlil qilinadi. Shuningdek, dunyo va o'zbek tilshunosligida ushbu yo'nalishda olib borilgan ilmiy tadqiqotlar qiyosiy asosda ko'rib chiqiladi. Terminlarning hosil bo'lish usullari, tarjima muammolari va semantik xususiyatlari ilmiy jihatdan yoritiladi.

Kalit so'zlar: terminologiya, avtomobil sohasi, xitoy tili, texnik terminlar, tarjima, lingvistika, globalizatsiya, leksikologiya

In the modern era, rapid technological development significantly influences language systems, particularly in the field of terminology. The automotive industry is one of the most dynamic sectors contributing to global economic growth. As a result, new concepts and terms constantly emerge, requiring systematic linguistic analysis. The study of automotive terminology is essential not only for linguistics but also for translation studies, intercultural communication, and technological development. The Chinese language, due to its isolating structure and unique writing system, demonstrates distinctive features in terminology formation. Understanding these features helps reveal broader patterns in linguistic evolution under globalization.

Theoretical Framework

Terminology is defined as a structured system of specialized lexical units used within a particular domain. Scholars emphasize that effective terminology must ensure clarity, precision, and consistency. In modern linguistics, term formation occurs through several mechanisms, including composition, affixation, semantic extension, borrowing, and calquing. Chinese terminology relies heavily on compounding and semantic transparency. Unlike Indo-European languages, where affixation dominates, Chinese forms terms by combining meaningful morphemes, often resulting in highly descriptive expressions.

Formation of Automotive Terminology

Automotive terminology encompasses a wide range of subfields, including mechanics, electronics, software engineering, and artificial intelligence. Terms such as 'engine control unit', 'electric vehicle', and 'autonomous driving system' reflect technological complexity. In Chinese, these terms are often translated using semantic calquing, preserving meaning while adapting to linguistic norms. For example, 'electric vehicle' becomes a compound reflecting both 'electricity' and 'vehicle'. This approach enhances comprehension among native speakers.

Comparative Analysis: Global Perspective

International linguistic research highlights that terminology development is influenced by technological leadership. English remains the dominant source of global technical terminology. However, Chinese increasingly contributes to the global lexicon due to its growing industrial influence. Researchers note that translation challenges arise from structural differences between languages. Multi-component terms require careful adaptation to maintain semantic equivalence and functional clarity.

Automotive Terminology in Uzbek Linguistics

In Uzbek linguistics, the study of automotive terminology is still developing. Scholars focus on adapting international terms into the Uzbek language while preserving national linguistic identity. This process involves both borrowing and creating native equivalents.

The lack of standardized terminology presents challenges, particularly in education and technical communication. However, ongoing research aims to establish consistent frameworks for term usage.

Linguistic Features of Chinese Automotive Terminology

Chinese automotive terminology is characterized by semantic transparency, brevity, and logical structure. Each component contributes to the overall meaning, making terms intuitive. Additionally, phonetic borrowing is used when necessary, especially for brand names and international innovations. The hierarchical structure of terms allows for systematic classification, which is beneficial for both linguistic analysis and practical application.

Impact of Technology and Globalization

Technological advancements, including artificial intelligence and digitalization, accelerate the creation and dissemination of terminology. New concepts such as 'smart vehicles', 'battery management systems', and 'autonomous navigation' illustrate this trend. Globalization leads to both convergence and divergence in terminology. While international standards promote uniformity, local adaptations reflect cultural and linguistic diversity.

Translation and Standardization Issues

Translation remains a key challenge in terminology studies. Ensuring accuracy while maintaining natural language flow requires deep linguistic competence. Standardization efforts, such as those led by international organizations, aim to unify terminology across languages. In the future, automated translation tools will play a larger role, though human expertise will remain essential to avoid semantic errors.

The study of automotive terminology in Chinese and Uzbek linguistics reveals significant differences and similarities shaped by linguistic structure and technological development. Chinese relies on internal resources, while Uzbek incorporates both native and borrowed elements. Further research is necessary to develop standardized terminology systems, improve translation practices, and enhance cross-cultural communication in the automotive field.

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DIVERSIFICATION OF FINANCIAL SOURCES AS A FACTOR OF SUSTAINABLE DEVELOPMENT OF CIVIL SOCIETY INSTITUTIONS

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Civil society institutions are increasingly involved in solving social problems, protecting public interests and delivering community-based initiatives. Their sustainability depends on financial resources, but the quality of those resources is as important as their volume. A civil society institution may receive a considerable amount of funding in a given year and still remain financially vulnerable if the funding is temporary, concentrated in one donor, or restricted to a narrow project. Therefore, diversification of financial sources becomes one of the key factors of sustainable development.

Financial diversification means the formation of a balanced portfolio of income sources that reduces dependence on one channel and increases the organization's ability to continue its mission under changing external conditions. For civil society institutions, such a portfolio may include state grants, subsidies, social orders, membership fees, donations, sponsorship, corporate social responsibility projects, international donor programs, paid services allowed by legislation, crowdfunding and reserve funds. Each source has advantages and limitations; therefore, the main task is not to replace one source with another, but to create a stable and transparent combination of resources.

The importance of diversification is related to several practical risks. First, donor dependence can limit institutional autonomy and create uncertainty when a program ends. Second, project-based financing often covers only direct activities and does not support administrative capacity, staff development or long-term planning. Third, the absence of reserve funds makes civil society institutions vulnerable to delays in transfers and unexpected costs. Finally, a narrow funding base may reduce trust among partners because the organization appears financially fragile.

In the context of Uzbekistan, the legal and institutional environment provides several instruments for supporting civil society institutions, including state grants, subsidies and social orders within the broader framework of social partnership. These

instruments create an important foundation, but sustainable development requires that they be combined with non-budgetary and community-based resources. Diversification can strengthen not only financial stability, but also public participation, accountability and the social legitimacy of civil society institutions.

Table-1

Main sources of financing and their role in the sustainability of civil society institutions

Source	Main advantage	Potential limitation	Sustainability role
State grants and subsidies	Legally defined support for socially significant initiatives	May be temporary and tied to administrative criteria	Provides institutional and project-based stability
Social orders	Connects public needs with service delivery by civil society institutions	Requires strong reporting and implementation capacity	Links funding with concrete social services
Donations and sponsorship	Flexible and community-oriented source	Depends on trust and communication with supporters	Strengthens local ownership and public engagement
Membership fees	Regular internal income for associations	Limited if membership base is narrow	Improves autonomy and internal responsibility
Paid services within legal limits	Generates own revenue and reduces donor dependence	Requires professional management and market demand	Supports long-term operational capacity
Crowdfunding and digital campaigns	Mobilizes small contributions from many supporters	Needs digital skills and strong public communication	Expands participation and visibility

Table 1 shows that each financing source contributes to sustainability in a different way. State support can provide institutional predictability, donor programs may bring innovation and expertise, community donations strengthen public trust, while own revenues increase autonomy. However, no single source can fully guarantee

sustainable development. A diversified model is effective only when the organization has transparent accounting, clear financial planning and a realistic strategy for resource mobilization.

Diversification should be understood as a gradual process. At the first stage, civil society institutions need to assess their current income structure and identify the share of each source. At the second stage, they should determine the risks connected with concentration, short-term funding and restricted expenditures. At the third stage, a resource mobilization plan should be prepared. This plan may include donor mapping, communication with business partners, development of membership programs, creation of paid services and formation of reserve funds. At the final stage, the results of diversification should be monitored through financial indicators such as income concentration, liquidity and the share of unrestricted funds.

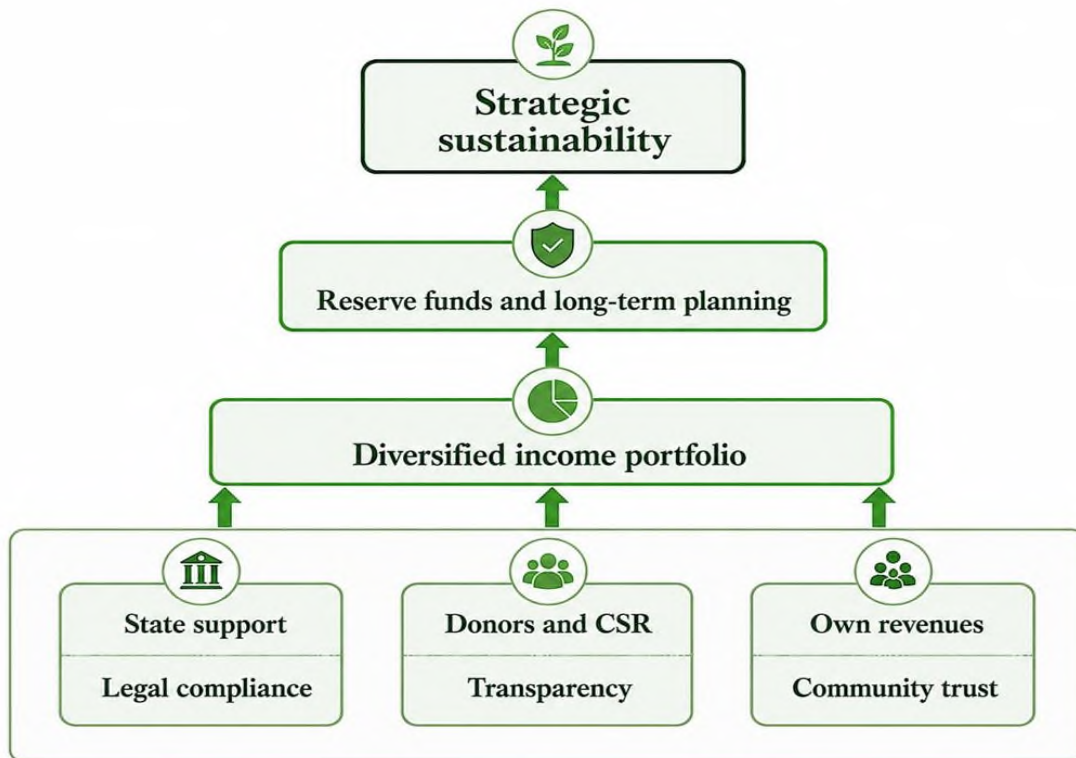


Figure-1. Diversified financial model of sustainable civil society institutions

Figure 1 presents diversification as a layered model. The foundation consists of legal compliance, transparency and community trust. Without these elements, it is difficult to attract any stable financial source. The middle level includes a diversified income portfolio, which should combine public and private, domestic and international, project-based and unrestricted resources. At the upper level, reserve funds and long-term planning transform diversified income into strategic sustainability.

Table 2

Financial concentration risks and diversification measures

Risk	Indicator of weakness	Diversification measure	Expected result
Donor concentration	One source provides more than half of annual income	Search for alternative donors, partners and public programs	Lower dependence on a single funder
Short-term funding	Most resources are linked to one-year projects	Introduce multi-year planning and reserve policy	Higher continuity of programs
Restricted budget	Funds cannot cover administrative or development costs	Negotiate overhead coverage and develop own revenues	Stronger institutional capacity
Low community engagement	Small number of local contributors or members	Develop membership, volunteering and crowdfunding campaigns	Higher legitimacy and social support
Weak liquidity	Cash gaps occur between project tranches	Create operating reserve and monthly cash-flow plan	Reduced risk of operational interruption

A key methodological issue is the measurement of diversification. It is not sufficient to count the number of funding sources, because several nominal sources may still depend on the same donor or the same type of project. Therefore, diversification should be assessed through both quantitative and qualitative indicators. Quantitative indicators include the share of the largest source in total income, the share of unrestricted funds, the ratio of own income to external support, and the number of months covered by reserves. Qualitative indicators include donor diversity, reliability of contracts, flexibility of funds and compatibility of financing with the organization's mission. At the same time, diversification should not lead to mission drift. Civil society institutions may be tempted to accept any available funding even when it does not correspond to their strategic goals. This can weaken institutional identity and reduce the quality of services. For this reason, a diversification strategy should be mission-based. Each new income source should be evaluated according to three criteria: whether it supports the social mission, whether it is financially sustainable, and whether it preserves transparency and accountability.

The role of the state remains important in diversified financing. Public support can encourage diversification by creating transparent grant and subsidy programs,

supporting social entrepreneurship, promoting tax incentives for philanthropy, and developing mechanisms of social contracting. In addition, state institutions can provide methodological support for financial planning and reporting. Such measures do not replace independent resource mobilization; rather, they create an enabling environment in which civil society institutions can strengthen their autonomy and public value.

In conclusion, diversification of financial sources is a strategic factor of sustainable development for civil society institutions. It reduces dependence on one donor, improves resilience to financial shocks, expands social participation and strengthens institutional autonomy. However, diversification produces positive results only when it is supported by transparent accounting, internal financial control, realistic planning and strong public communication. A diversified income structure should therefore be treated as a long-term management objective rather than a short-term fundraising activity.

The following recommendations may be proposed: civil society institutions should regularly analyze the concentration of income sources; they should develop resource mobilization strategies linked to their mission; reserve funds and cash-flow planning should be introduced; reporting systems should distinguish restricted and unrestricted funds; and public support mechanisms should encourage the attraction of additional non-budgetary resources. Implementation of these measures will contribute to the sustainable development of civil society institutions and improve their capacity to serve public interests.

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