PEOPLE
KNOWLEDGE
COLLABORATION
SUSTAINABLE
SOLUTIONS
FOR A BETTER
WORLD

RESEARCH
IDEAS
INNOVATION
A BRIGHTER
GLOBAL TOMORROW

INTERNATIONAL CONFERENCE ON GLOBAL RESEARCH AND INNOVATION (ICGRI-2026)

SCIENCE
TECHNOLOGY
SOCIETY
INNOVATION
GLOBAL IMPACT

20.09.2026 | London, United Kingdom



www.academscience.com

zenodo | OpenAIRE

United Kingdom
Academic Research Publisher Ltd

****

MATERIALS
the international scientific-practical conference
«INTERNATIONAL CONFERENCE ON GLOBAL RESEARCH AND INNOVATION (ICGRI-2026)»

London
September 20, 2026

****

INTERNATIONAL CONFERENCE ON GLOBAL RESEARCH AND INNOVATION (ICGRI-2026) // materials international scientific-practical conference. London, United Kingdom. September 10, 2026.

Editorial board of the conference

Temnova L.V. - DSc, Professor (Moscow, Russia); **Sagatbayev Y.N. -** PhD, professor (Astana, Kazakstan); **Duyshenaliev CH.D. -** DSc, Professor (Byshkek, Kyrgyzstan); **Pashkov S.V. -** PhD, professor (Petropavlovsk, Kazakstan); **Khakimov K.A. -** PhD, docent (Tashkent, Uzbekistan); **Melekoglu M. -** DSc, professor (Eskisehir, Turkey).

This event aims to discuss contemporary research across various scientific fields, exchange new scientific ideas, and support scientific activities aligned with global innovative processes.

Within the framework of the conference, scientists, researchers, young scholars, and practicing specialists will have the opportunity to present their research results, exchange scientific ideas, and expand international cooperation.

The main objective of this International Scientific-Practical Conference is to consolidate the results of contemporary research across various scientific fields and strengthen the integration of science and practice through advanced scientific approaches.

**The authors are responsible for the content of the articles, the information, facts, and figures presented therein.*

The proceedings of the International Scientific-Practical Conference have been discussed by the Scientific-Technical Council of the international publisher **"Academic Research Publisher"** (London, United Kingdom) and recommended for publication (September 19, 2026, Protocol No. 24.3).

CONTENTS

1-SECTION.....12

ZARAFSHON MILLIY TABIAT BOG‘I HUDUDIDA MUSTAQIL AVTOMATLASHTIRILGAN METEOROLOGIK KUZATUV PUNKTI (AMS)NI TASHKIL ETISHNING ILMIY-AMALIY ZARURATI 13

THE IMPORTANCE OF WILD PLUM IN NURSERY PRODUCTION 22

THERMAL WATERS: NATURAL-GEOGRAPHICAL CHARACTERISTICS, FORMATION PATTERNS, AND HISTORY OF THEIR STUDY 27

HYGIENIC ASSESSMENT OF WORKING CONDITIONS AND PRODUCTION ENVIRONMENT FACTORS FOR THERMAL POWER PLANT WORKERS 37

ATMOSFERA HAVOSI IFLOSLANISHINING O‘SMIR O‘G‘IL BOLALAR ORGANIZMIGA KOMPLEKS TA’SIRI 43

DETERMINATION OF MOLYBDENUM(VI) AND VANADIUM(IV) IONS IN ENVIRONMENTAL SAMPLES USING SORPTION AND SPECTROPHOTOMETRIC METHODS 48

ПОЛИСАХАРИДНЫЕ КОМПЛЕКСЫ *PHLOMOIDES CANESCENS* КАК ПЕРСПЕКТИВНЫЙ ИСТОЧНИК ПРЕБИОТИЧЕСКИХ КОМПОНЕНТОВ 54

VITAMIN COMPOSITION OF FRUITS CALLED *RUBUS CAESIUS L.* GROWING IN THE FERGANA REGION 62

O‘ZBEKISTONDA EKOLOGIYA HUQUQI RIVOJLANISHI VA HOZIRGI HOLATI 67

2-SECTION.....**73**

SUN’IY INTELLEKT TEXNOLOGIYALARI VA ULARNING KO‘P QAVATLI UYLARNI BOSHQARISH HAMDA KOMMUNAL SOHADAGI AMALIY TATBIQI.....74

SEARCHING, FILTERING, AND VERIFYING INFORMATION USING GENERATIVE ARTIFICIAL INTELLIGENCE TOOLS 82

THEORETICAL FOUNDATIONS FOR DESIGNING AN AI-BASED METHODOLOGY.....91

THE EFFECT OF PHET INTERACTIVE SIMULATIONS AND ARTIFICIAL INTELLIGENCE-BASED LEARNING ON SEVENTH-GRADE STUDENTS’ PHYSICS ACHIEVEMENT 96

3-SECTION.....**109**

INNOVATIVE TECHNOLOGICAL SOLUTIONS FOR ENHANCING FOUNDATION RELIABILITY IN LOW-HEAD HYDRAULIC STRUCTURES 110

ANALYSIS OF MATHEMATICAL METHODS AND EXISTING APPROACHES FOR OPTIMIZING MINING-TECHNOLOGICAL PROCESS PARAMETERS USING HETEROGENEOUS SPATIO-TEMPORAL DATA 115

TALABALARNI MUHANDISLIK KASBIY FAOLIYATIGA TAYYORLASHDA INTERFAOL METODLARNING ROLI 120

STABILIZATION AND SAFETY CRITERIA FOR LOW-HEAD HYDRAULIC STRUCTURES ON DEFORMABLE FOUNDATIONS 125

“TIKUVCHILIK SOHASIDA ZAMONAVIY KASBIY KOMPETENSIYALARNI SHAKLLANTIRISH: TA’LIM VA MEHNAT BOZORI INTEGRATSIYASI” 132

QAYTA TIKLANUVCHI ENERGIYA ASOSIDAGI AQLLI YO‘L INFRASTRUKTURASI VA UNING PEDAGOGIK TIZIMDAGI O‘RNI 145

ХУДОЖЕСТВЕННО-ЭСТЕТИЧЕСКИЕ ВОЗМОЖНОСТИ ПУЗЫРЬКОВОГО ГЛАЗИРОВАНИЯ В ОБРАБОТКЕ ПОВЕРХНОСТИ КЕРАМИЧЕСКИХ ИЗДЕЛИЙ 150

IMPROVING AI-BASED INTERACTIVE TEACHING METHODOLOGY IN THE ‘MATERIALS RESISTANCE’ COURSE 156

VOLTAGE REGULATION FOR SMALL WIND TURBINES 162

4-SECTION 166

MATHEMATICAL-STATISTICAL ASSESSMENT AND INDIVIDUAL PREDICTION OF DENTAL CARIES RISK IN CHILDREN UNDER THE CONDITIONS OF UZBEKISTAN 167

ТУРЛИ ХИЛ АЛИМЕНТАР МИКРОЭЛЕМЕНТОЗЛАРДА КАЛАМУШЛАР ЖИГАРИ МОРФОМЕТРИК КЎРСАТКИЧЛАРИНИНГ ҚИЁСИЙ ТАҲЛИЛИ 172

GEOGRAPHIC AND MATHEMATICAL MODELLING OF DENTAL CARIES RISK ACROSS THE REGIONS OF UZBEKISTAN 174

THE COLLAGEN FIBRE FRACTION OF THE LIVER AS AN INDICATOR OF EARLY FIBROGENESIS IN EXPERIMENTAL ALIMENTARY MICROELEMENTOSIS 178

HYGIENIC ASSESSMENT OF THE IMPACT OF LIFESTYLE AND BEHAVIORAL RISK FACTORS ON THE HEALTH STATUS OF MEDICAL EDUCATION TEACHERS 181

THE IMPORTANCE OF HYGIENIC PREVENTION IN PREVENTING HEALTHCARE-ASSOCIATED INFECTIONS IN MEDICAL INSTITUTIONS DEPARTMENT OF COMMUNITY AND OCCUPATIONAL HYGIENE....186

KAMYOB YER ELEMENTLARINING 2-(METILAMINO)BENZOY KISLOTASI BILAN KOMPLEKS BIRIKMALARI 191

GESTATSION QANDLI DIABETNING ZAMONAVIY JIHATLARI VA XAVF OMILLARI 194

СИНТЕЗ, СТРУКТУРА И СВОЙСТВА КОМПЛЕКСОВ НЕКОТОРЫХ РЕДКОЗЕМЕЛЬНЫХ ЭЛЕМЕНТОВ С ПРОИЗВОДНЫМИ АМИНОБЕНЗОЙНОЙ КИСЛОТЫ.....199

ОСОБЕННОСТИ ОРТОПЕДИЧЕСКОЙ СТОМАТОЛОГИЧЕСКОЙ РЕАБИЛИТАЦИИ ПАЦИЕНТОВ С ЗАБОЛЕВАНИЯМИ ТОНКОГО КИШЕЧНИКА 202

РОЛЬ ЛАБОРАТОРНЫХ ПОКАЗАТЕЛЕЙ В РАННЕЙ ДИАГНОСТИКЕ ХРОНИЧЕСКОЙ БОЛЕЗНИ ПОЧЕК 208

FEATURES OF MACRO- AND MICROELEMENT METABOLISM IN THE DEVELOPMENT OF MINOR HEART ANOMALIES IN CHILDREN 219

ФЕНОТИПИЧЕСКИЕ МАРКЕРЫ НЕДИФФЕРЕНЦИРОВАННОЙ ДИСПЛАЗИИ СОЕДИНИТЕЛЬНОЙ ТКАНИ У ДЕТЕЙ С МАЛЫМИ АНОМАЛИЯМИ СЕРДЦА 227

5-SECTION.....233

PROSPECTS AND CHALLENGES OF DEVELOPING THE ORGANIC FOOD MARKET IN UZBEKISTAN.....234

THE ROLE AND SIGNIFICANCE OF MOBILE BANKING IN THE DEVELOPMENT OF DIGITAL RETAIL SERVICES IN COMMERCIAL BANKS 238

MANAGING PROJECT CASH FLOW IN SMALL IT INTEGRATION FIRMS IN UZBEKISTAN.....243

THE IMPORTANCE OF MARKETING RESEARCH IN THE MEDICAL SERVICES MARKET 250

IMPROVING THE FINANCIAL SUPPORT AND DEVELOPMENT MECHANISMS OF WOMEN'S ENTREPRENEURSHIP IN UZBEKISTAN BASED ON INTERNATIONAL EXPERIENCE.....255

INTELLIGENT CRM SYSTEMS AS A TOOL FOR IMPROVING SALES EFFICIENCY AND SME FINANCING IN COMMERCIAL BANKS.....263

THE MECHANISM OF TRANSFORMING THE CULTURAL VALUE OF NATIONAL FASHION ELEMENTS INTO VALUE ADDED IN UZBEKISTAN'S TOURISM PRODUCTS 273

UZBEKISTAN–INDIA POLITICAL AND STRATEGIC PARTNERSHIP: CURRENT STATE, CHALLENGES AND PROSPECTS FOR DEVELOPMENT 278

THE COMPLEMENTARITY OF RESTRICTED COMBINABILITY AND LEXICAL FUNCTION THEORY IN THE DESCRIPTION OF COLLOCATIONAL RELATIONS 289

"FORMATION AND DEVELOPMENT OF ISLAMIC BANKING IN UZBEKISTAN BASED ON FOREIGN EXPERIENCE (KAZAKHSTAN)" . 298

TRANSITION OF SMALL BUSINESS ENTITIES TO IFRS IN UZBEKISTAN: PRACTICAL PROBLEMS AND STRATEGIC SOLUTIONS 306

ECONOMETRIC ANALYSIS AND MANAGEMENT ACCOUNTING MODERNIZATION AS FACTORS FOR OPTIMIZING THE PERFORMANCE OF POWER SECTOR ENTERPRISES (a case study of Osh) 311

ВЛИЯНИЕ ИСЛАМСКИХ БАНКОВСКИХ УСЛУГ НА ФИНАНСОВУЮ ЭФФЕКТИВНОСТЬ КОММЕРЧЕСКИХ БАНКОВ 326

FINANCING ENTREPRENEURIAL ACTIVITY: MODERN MECHANISMS AND THE ROLE OF FINTECH 333

6-SECTION 339

OLIY TA'LIMDA BO'LAJAK PEDAGOGLARNING DIDAKTIK-LOYIHALASH KOMPETENTLIGINI RIVOJLANTIRISHNING NAZARIY-METODIK ASOSLARI 340

O'ZBEKISTONDA YENGIL VA OZIQ OVQAT SANOATINING HOLATI (1941-1950 YILLAR) 346

BOSHLANG'ICH SINFLARDA BADIIY ASARLARNI O'RGATISHNING PEDAGOGIK-PSIXOLOGIK ASOSLARI 353

DEVELOPING FUTURE TEACHERS' INTERCULTURAL-PROFESSIONAL COMPETENCE THROUGH THE "INTERNATIONALIZATION AT HOME" APPROACH 363

PHILOSOPHICAL FOUNDATIONS OF THE EDUCATIONAL TRANSFORMATION PROCESS 372

REGIONAL OUTCOMES OF STATE POLICY ON PHYSICAL EDUCATION AND MASS SPORT DEVELOPMENT IN UZBEKISTAN: AN ANALYSIS

BASED ON THE CASE OF NAVOIY REGION AND KARMANA DISTRICT 377

SHAHAR YO'L INFRATUZILMASIDA VAQTINCHALIK TIRBANDLIKLARNI KAMAYTIRISH UCHUN DATCHIKLAR VA MASOFAVIY MONITORING TIZIMLARINI INTEGRATSIYA QILISHNI TEXNIK TA'LIMDA O'QITISHNING PEDAGOGIK-METODIK MODELI 390

TABIIY FANLARNI O‘QITISHDA 5-SINF O‘QUVCHILARI UCHUN LOYIHA ISHLARINI TASHKIL ETISH METODIKASI 398

PEDAGOGICAL ADAPTATION OF CHINA’S ABACUS-BASED MENTAL ARITHMETIC EXPERIENCE FOR DEVELOPING PRIMARY PUPILS’ CREATIVE COMPETENCE IN UZBEKISTAN 406

METHODOLOGICAL POSSIBILITIES FOR DEVELOPING STUDENTS' COMPETENCE IN WORKING WITH HISTORICAL EVIDENCE IN HISTORY LESSONS 411

BO‘LAJAK O‘QITUVCHILARDA PEDAGOGIK TAJRIBANI BILIMGA AYLANTIRISH KOMPETENTLIGINING MAZMUNI, TUZILMASI VA KOMPONENTLARI 418

ПРОБЛЕМА НЕХВАТКИ КАДРОВ В СИСТЕМЕ ОБРАЗОВАНИЯ УЗБЕКИСТАНА (1991–2000 гг.) 426

TEACHER ROLES AND STUDENT-CENTERED LEARNING IN UZBEKISTAN: LESSONS FROM FINLAND, JAPAN, AND SOUTH KOREA 433

IDENTIFICATION OF NONLINEAR FILTRATION MODEL PARAMETERS FROM PRESSURE OBSERVATION DATA 442

STEAM TA’LIMI VA PEDAGOGIK MADANIYAT INTEGRATSIYASI ... 446

MATHEMATICAL AND STATISTICAL ANALYSIS OF EXPERIMENTAL WORK AIMED AT DEVELOPING STUDENTS’ METAPREVENTIVE COMPETENCE 454

ПРОФЕССИОНАЛЬНАЯ РЕЗИЛЬЕНТНОСТЬ ПРЕПОДАВАТЕЛЯ ВЫСШЕЙ ШКОЛЫ В УСЛОВИЯХ ТРАНСФОРМАЦИИ ОБРАЗОВАТЕЛЬНОЙ СРЕДЫ 462

7-SECTION 467

IJTIMOIY ADOLATNING SIYOSIY VA HUQUQIY ASOSLARI 468

IJTIMOIY DAVLATDA FUQAROLIK INSTITUTLARINING HUQUQIY MAQOMI 473

IJTIMOIY DAVLATNING STRATEGIK MEZONLARI 480

APPLIED POLITICAL SCIENCE: STRUCTURE, SOCIAL FUNCTIONS, RESEARCH DIRECTIONS, POLITICAL FORECASTING AND CONTEMPORARY CHALLENGES 488

OTTO KERNBERG VA HAYNS KOHUTLARGA KO‘RA SHAXS STRUKTURASI 498

JADID MUTAFAKKIRLARI MEROSIDA MEHNAT QADRIYATLARI.... 505

THE ROLE OF PHYSICAL CULTURE IN THE PROCESS OF SOCIAL REPRODUCTION: SOCIO-PHILOSOPHICAL ANALYSIS 510

CERTAIN CUSTOMS PRACTICES UPON THE ARRIVAL OF A BRIDE ("KELIN") IN THE LIFE OF UZBEKS LIVING ON THE LEFT BANK OF THE AMU DARYA..... 518

THE CONCEPT AND THEORETICAL-LEGAL FOUNDATIONS, TYPES, AND FORMS OF PARTICIPATION IN CRIMINAL LAW 523

THE PRINCIPLE OF SOCIAL JUSTICE AND ITS SUBSTANCE IN THE CONSTITUTION OF NEW UZBEKISTAN 531

QADIMGI SO'G'D VA BAQTRIYADA AYOLLARNING MAVQEI: ARXEOLOGIK MANBALAR ASOSIDA 536

SHAMANISM AMONG TURKIC PEOPLES: KARAKALPAK PORKHANSHIP 541

TRADITIONAL FARMING OF THE KARAKALPAKS IN THE AMU DARYA DELTA (19TH–20TH CENTURIES) 545

ПРОБЛЕМЫ РАЗРЕШЕНИЯ ИНДИВИДУАЛЬНЫХ ТРУДОВЫХ СПОРОВ В РЕСПУБЛИКЕ УЗБЕКИСТАН..... 550

GIVING A SHARE ("ENSHI") IN THE TRADITIONAL SOCIETY OF THE KARAKALPAKS: SOCIO-ECONOMIC FUNCTION AND TRANSFORMATION 557

УГОЛОВНО-ПРАВОВАЯ ЗАЩИТА ПОТЕРПЕВШЕЙ ОТ ИЗНАСИЛОВАНИЯ 562

AL-ZAHRAWI’S KITĀB AL-TAṢRĪF*:* SYSTEMATIZING MEDIEVAL SURGERY 570

8-SECTION..... 583

MILITARY COMMUNICATION AND TRANSLATION PROBLEMS IN MILITARY TEXTS 584

ADAPTING TASK-BASED LANGUAGE TEACHING TO THE PROFESSIONAL LANGUAGE NEEDS OF FINANCE STUDENTS 595

JACK LONDONNING “THE HOUSE BEAUTIFUL” ESSESIDA MUALLIF SHAXSIYATINING BADIIY IFODASI 602

COMPARATIVE ANALYSIS OF CONNOTATIVE MEANINGS OF ANTHROPONYMS IN ENGLISH AND UZBEK 607

METAPHORICAL MODELING OF THE CONCEPT OF LOVE IN ENGLISH AND UZBEK 613

IMPLICIT COMPETENCE DEVELOPMENT IN FUTURE ENGLISH TEACHERS THROUGH INNOVATIVE APPROACHES 618

ABU-L-QOSIM AZ-ZAHRAVIY HAYOTI VA ILMIY FAOLIYATINING ASOSIY YO‘NALISHLARI 623

LEXICAL-SEMANTIC ANALYSIS OF MILITARY TERMS 632

O‘ZBEKISTONDAGI EFL TA’LIM OLUVCHILARINING YOZISH KO‘NIKMASINI RIVOJLANTIRISHDA FORMATIV BAHOLASHNI TAKOMILLASHTIRISH: O‘QITUVCHI VA AVTOMATLASHTIRILGAN FEEDBACKNING O‘RNI 638

ONA TILI TA’LIMIDA TINGLAB TUSHUNISH TOPSHIRIQLARINI MOSLASHUVCHAN LOYIHALASH MEXANIZMI 647

THE ROLE OF UZBEK PROVERBS IN THE FORMATION OF MORAL AND ETHICAL VALUES: A LINGUOCULTURAL AND PAREMIOLOGICAL PERSPECTIVE 655

STRUCTURAL-SEMANTIC CHARACTERISTICS OF SPEECH ACTIVITY VERBS IN ENGLISH 662

BEATRIS FORBES MENZNING “TEMUR – YUKSALISH VA HUKMRONLIK YO‘LI” ASARI TAHLILI 668

FUNCTIONAL-SEMANTIC CHARACTERISTICS OF ARCHAISMS IN *BABURNAMA* 672

TRANSLATION STRATEGIES FOR ARCHAIC LEXICAL UNITS IN *BABURNAMA* 679

CULTURAL NON-EQUIVALENCE IN THE TRANSLATION OF HISTORICAL LEXIS IN *BABURNAMA* 686

THE CONTRIBUTION OF THE TEMURIAN QUEENS TO THE PROSPERITY OF CULTURAL LIFE IN THE EXAMPLE OF GAVHARSHODBEGIM 694

THE PROBLEM OF DISCREPANCY BETWEEN THE DENOTATIVE AND CONNOTATIVE MEANINGS OF SPORT TERMS 700

ДЖАДИДИЗМ В КАЧЕСТВЕ ФИЛОСОФИИ И ПЕДАГОГИКИ НОВОГО СОЗНАНИЯ 705

ПРЕЦЕДЕНТНЫЕ ТЕКСТЫ В ЯЗЫКЕ СОВРЕМЕННЫХ СМИ 713

ABU RAYHAN BERUNI'S WORK "THE CHRONOLOGY OF ANCIENT NATIONS" AS A UNIQUE SOURCE OF HISTORICAL ONOMASTICS ... 718

PHONOLOGICAL AND ORTHOGRAPHIC ADAPTATION OF ENGLISH LOANWORDS IN UZBEK AND KOREAN: A COMPARATIVE ANALYSIS 725

1-SECTION

ZARAFSHON MILLIY TABIAT BOG‘I HUDUDIDA MUSTAQIL AVTOMATLASHTIRILGAN METEOROLOGIK KUZATUV PUNKTI (AMS)NI TASHKIL ETISHNING ILMIY-AMALIY ZARURATI

Xolmanov Erkin Bazarovich

Samarqand davlat universiteti

Geografiya va tabiiy resurslar kafedrasi

2-bosqich mustaqil izlanuvchi

Otabekbozorov492@gmail.com

Annotatsiya. *Ushbu maqolada Zarafshon milliy tabiat bog‘i hududida mustaqil avtomatlashtirilgan meteorologik kuzatuv punkti (AMS) tashkil etishning ilmiy-amaliy zarurati asoslab berilgan. Hozirgi kunda bog‘ hududidagi iqlim ko‘rsatkichlari faqat Samarqand shahridagi mintaqaviy gidrometeorologiya stansiyasi ma’lumotlari asosida baholanmoqda, biroq bu ma’lumotlar to‘qay ekotizimiga xos mikroiqlim xususiyatlarini — o‘simlik qatlamining bug‘lanish va soyalash ta’sirini, daryo yaqinligidan kelib chiqadigan namlik rejimini, shamol tezligining pasayishini — to‘liq aks ettira olmaydi. Maqolada tavsiya etilayotgan AMS ning texnik tarkibi, joylashtirish tamoyillari hamda undan kutilayotgan ilmiy-amaliy natijalar jadval shaklida tizimlashtirilgan.*

Kalit so‘zlar: *Zarafshon milliy tabiat bog‘i, to‘qay ekotizimi, mikroiqlim, avtomatlashtirilgan meteorologik stansiya (AMS), ekologik monitoring, mintaqaviy iqlim.*

Аннотация. *В статье обоснована научно-практическая необходимость создания самостоятельного автоматизированного метеорологического поста (АМС) на территории Зарафшанского национального природного парка. В настоящее время климатические показатели территории парка оцениваются только по данным региональной гидрометеорологической станции города Самарканда, однако эти данные не отражают в полной мере особенности микроклимата тугайной экосистемы — влияние испарения и затенения растительного покрова, режим влажности, обусловленный близостью реки, а также снижение скорости ветра. В статье систематизированы в табличной форме техническая комплектация рекомендуемой АМС, принципы её размещения и ожидаемые научно-практические результаты.*

Ключевые слова: *Зарафшанский национальный природный парк, тугайная экосистема, микроклимат, автоматизированная метеорологическая станция (АМС), экологический мониторинг, региональный климат.*

Annotation. *This article substantiates the scientific and practical necessity of establishing an independent automated meteorological station (AMS) within the territory of Zarafshon National Nature Park. At present, the climatic indicators of the park's territory are assessed solely on the basis of data from the regional hydrometeorological station in Samarkand city; however, such data cannot fully reflect the microclimatic features specific to the tugay (floodplain forest) ecosystem, including the evapotranspiration and shading effect of the vegetation cover, the humidity regime associated with river proximity, and the reduction of wind speed. The article systematizes, in tabular form, the recommended technical composition of the AMS, the principles of its siting, and the expected scientific-practical outcomes.*

Key words: *Zarafshon National Nature Park, tugay ecosystem, microclimate, automated meteorological station (AMS), ecological monitoring, regional climate.*

KIRISH

O‘zbekiston Respublikasi hududidagi tabiiy-qo‘riqxona fondi ob’ektlarining ekologik monitoringini ilmiy asosda yuritish, ularning tabiiy komponentlari — iqlim, tuproq, o‘simlik va hayvonot dunyosi — o‘rtasidagi o‘zaro bog‘liqlikni aniq ma’lumotlar asosida baholash bugungi kunning dolzarb vazifalaridan biri hisoblanadi. Zarafshon milliy tabiat bog‘i O‘zbekiston Respublikasi Vazirlar Mahkamasining 2018-yil 7-fevraldagi 82-son qarori asosida, 1975-yilda tashkil etilgan qo‘riqxona negizida barpo etilgan bo‘lib, Samarqand viloyatining Jomboy va Bulung‘ur tumanlari hududida, Zarafshon daryosining o‘ng qirg‘og‘i bo‘ylab, daryo yo‘nalishi bo‘yicha taxminan 47 kilometrga cho‘zilgan holda joylashgan. Bog‘ning umumiy maydoni 2426,4 gektarni tashkil etadi va u Samarqand shahridan taxminan 8 kilometr masofada boshlanadi.

Zarafshon milliy tabiat bog‘i O‘rta Osiyoning tekislik zonasida saqlanib qolgan yagona yirik to‘qay o‘rmoni majmualaridan biri bo‘lib, u Butunjahon yovvoyi tabiatni muhofaza qilish fondi (WWF)ning Global 200 ekomintaqalar ro‘yxatiga kiritilgan. Bog‘ hududida to‘rang‘il, tol, terak, yulg‘un, chakanda, jiyda, qamishzor kabi to‘qayga xos o‘simliklar, shuningdek Buxoro bug‘usi,

Zarafshon qirg‘ovuli, O‘rta Osiyo qunduzi kabi noyob va endemik hayvon turlari muhofaza qilinadi. Bunday o‘ziga xos ekotizimning barqarorligini ta’minlash, undagi biologik jarayonlarni ilmiy kuzatish uchun, birinchi navbatda, mahalliy mikroiqlim sharoitlari haqida aniq va uzluksiz ma’lumotlarga ega bo‘lish zarur.

Hozirgi vaqtda bog‘ hududidagi iqlim sharoiti bevosita o‘rganilmasdan, balki undan o‘nlab kilometr uzoqlikda joylashgan, butunlay boshqa landshaft-geografik sharoitga ega bo‘lgan Samarqand shahridagi mintaqaviy avtomatlashtirilgan meteorologik stansiya (AMS) ma’lumotlari asosida taxmin qilinadi. Bunday yondashuv metodologik jihatdan yetarli emas, chunki shahar sharoiti (issiqlik oroli effekti, ochiq landshaft, past namlik) to‘qay ekotizimining zich o‘simlik qatlami, daryo yaqinligi va yuqori bug‘lanish bilan bog‘liq mikroiqlimidan tubdan farq qiladi. Shu sababli, Zarafshon milliy tabiat bog‘i hududiga mustaqil AMS o‘rnatish — bog‘ning ilmiy-tadqiqot va ekologik monitoring salohiyatini sifat jihatidan yangi bosqichga olib chiquvchi dolzarb chora sifatida baholanadi.

TADQIQOTNING MAQSADI VA VAZIFALARI

Tadqiqotning maqsadi — Zarafshon milliy tabiat bog‘i hududida mustaqil avtomatlashtirilgan meteorologik kuzatuv punkti (AMS) tashkil etishning ilmiy-nazariy asoslarini yoritish va uning amaliy tavsiyalarini ishlab chiqishdan iborat. Ushbu maqsadga erishish uchun quyidagi vazifalar belgilandi: mavjud mintaqaviy meteorologik kuzatuv tarmog‘ining bog‘ hududini qay darajada qamrab olishini tahlil qilish; to‘qay mikroiqlimining shaharga xos iqlimdan farqlanishini keltirib chiqaruvchi landshaft omillarini aniqlash; tavsiya etilayotgan AMSning texnik tarkibini va o‘rnatish tamoyillarini ishlab chiqish; AMS joriy etilishidan kutilayotgan ilmiy va amaliy natijalarni asoslash.

TADQIQOT OB’EKTI VA METODLARI

Tadqiqot ob’ekti sifatida Zarafshon milliy tabiat bog‘i hududi, xususan uning to‘qay o‘rmoni bilan qoplangan markaziy qismi tanlab olindi. Tadqiqotda qiyosiy-geografik tahlil, kartografik va statistik-tahliliy metodlar, shuningdek

adabiyotlar tahlili (literature review) metodlaridan foydalanildi. Tavsiya etilayotgan AMS uskunalarining texnik tavsifi Butunjahon Meteorologiya Tashkiloti (BMT/WMO)ning meteorologik kuzatuvlarni tashkil etish bo‘yicha uslubiy qo‘llanmasi (WMO-No.8, Guide to Instruments and Methods of Observation) talablariga muvofiq tanlab olindi. To‘qay ekotizimlariga xos mikroiqlim tendensiyalari esa daryo bo‘yi o‘rmon massivlari mikroiqlimi bo‘yicha yuritilgan umumiy ilmiy adabiyotlar tahlili asosida umumlashtirildi, chunki bog‘ hududida hozirgacha uzluksiz asboblar bilan kuzatuv olib borilmagan — bu, aynan, tadqiqotning dolzarbligini yana bir bor tasdiqlaydi.

TADQIQOT NATIJALARI VA MUHOKAMA

Mavjud meteorologik kuzatuv tarmog‘ining tahlili

Zarafshon milliy tabiat bog‘i hozirgi kunda mustaqil meteorologik kuzatuv punktiga ega emas. Bog‘ hududidagi iqlim ko‘rsatkichlari, jumladan havo harorati, namlik, yog‘in miqdori va shamol tezligi haqidagi ma’lumotlar Samarqand shahridagi mintaqaviy gidrometeorologiya stansiyasi ma’lumotlari asosida umumlashtiriladi. Biroq ikkala nuqta o‘rtasidagi masofa, landshaft tuzilishi va yer usti qoplamidagi tub farqlar quyidagi 1-jadvalda keltirilgan.

1-jadval

Samarqand shahri mintaqaviy AMS va tavsiya etilayotgan Zarafshon MTB AMS o‘rtasidagi qiyosiy tavsif

Ko‘rsatkich	Samarqand AMS (mintaqaviy, shahar sharoiti)	Tavsiya etilayotgan Zarafshon MTB AMS (to‘qay sharoiti)	Farqning ilmiy ahamiyati
Joylashuv turi	Shahar qurilgan maydoni, ochiq maydon	Daryo o‘zani yaqinidagi to‘qay o‘rmoni ichi	Landshaft-iqlim farqini aniqlash imkonini beradi
Markazdan masofa	—	Samarqand shahridan taxminan 8 km janubi-sharqda	Mintaqaviy ma’lumotni to‘g‘ridan-to‘g‘ri ekstrapolyatsiya

			qilib bo‘lmasligini asoslaydi
O‘simlik qatlami	Kam, asosan antropogen landshaft	Zich to‘qay o‘rmoni: tol, terak, yulg‘un, jiyda, chakanda, qamishzor	Bug‘lanish, soyalash va shamol tezligiga ta’sirni aks ettiradi
Suv omboriga yaqinlik	Bevosita bog‘liq emas	Zarafshon daryosi o‘zaniga bevosita tutash	Havo namligi va harorat tebranishiga ta’sir etuvchi omil
Kuzatuv maqsadi	Umummintaqaviy sinoptik va iqlim monitoringi	To‘qay ekotizimi mikroiqlimini, biologik xilma-xillik dinamikasini ilmiy kuzatish	Qo‘riqxona ekologik monitoring tizimini takomillashtiradi

To‘qay mikroiqlimining shakllanish omillari

Daryo bo‘yi to‘qay ekotizimlarining mikroiqlimi bir necha landshaft omillari ta’sirida shakllanadi. Birinchidan, zich daraxt-buta qatlami quyosh radiatsiyasining yer yuzasiga bevosita tushishini kamaytiradi, natijada kunduzgi maksimal harorat pasayadi va tuproq yuza qatlamining kunlik harorat amplitudasi kichrayadi. Ikkinchidan, o‘simliklarning transpiratsiyasi va daryo suvi yuzasidan bo‘lgan bug‘lanish havo namligini oshiradi. Uchinchidan, o‘rmon qatlami shamol oqimiga mexanik to‘siq bo‘lib, uning tezligini sezilarli darajada pasaytiradi. To‘rtinchidan, daryo suv massasining issiqlik sig‘imi yuqori bo‘lgani sababli, u yaqin atrofdagi havo haroratining keskin o‘zgarishiga barqarorlashtiruvchi ta’sir ko‘rsatadi. Ushbu omillarning barchasi yig‘indisi natijasida to‘qay zonasidagi mikroiqlim ochiq, antropogenlashgan landshaftlarnikidan — jumladan Samarqand shahrinikidan — sezilarli darajada farq qilishi kutiladi.

Tavsiya etilayotgan AMSning texnik tarkibi

Zarafshon milliy tabiat bog‘i sharoitida uzluksiz va aniq ma’lumot olish uchun quyosh paneli bilan quvvatlanuvchi, GSM/GPRS yoki sun’iy yo‘ldosh aloqa kanali orqali ma’lumotlarni real vaqt rejimida uzatuvchi to‘liq avtonom AMS o‘rnatish tavsiya etiladi. Uskunaning tavsiya etiladigan texnik tarkibi 2-jadvalda keltirilgan.

2-jadval

Zarafshon MTB uchun tavsiya etilayotgan AMS ning datchiklar tarkibi va texnik tavsiflari

Datchik (sensor)	**O‘lchanadigan parametr**	**Tavsiya etiladigan aniqlik**	**Kuzatuv chastotasi**
Termodatchik	Havo harorati (°C)	± 0,2 °C	10 daqiqada 1 marta
Gigrometr	Nisbiy namlik (%)	± 2–3 %	10 daqiqada 1 marta
Anemometr / shamol yo‘nalishi datchigi	Shamol tezligi va yo‘nalishi	± 0,3 m/s	Uzluksiz, o‘rtacha 10 daqiqalik
Yog‘in o‘lchagich (tipping-bucket)	Atmosfera yog‘inlari miqdori (mm)	0,2 mm bosqichda	Yog‘in davomida uzluksiz
Piranometr	Quyosh radiatsiyasi (W/m²)	± 5 %	10 daqiqada 1 marta
Tuproq harorati va namligi datchigi	Tuproqning 5, 20, 50 sm chuqurlikdagi holati	± 0,5 °C; ± 3 % namlik	Soatiga 1 marta
Bosim datchigi (barometr)	Atmosfera bosimi (hPa)	± 0,3 hPa	10 daqiqada 1 marta
Ma’lumot logeri va aloqa moduli	Ma’lumotlarni yig‘ish, saqlash va uzatish (GSM/GPRS yoki quyosh energiyasi bilan)	Avtonom ishlash — kamida 12 oy	Real vaqt rejimida uzatish

AMSni joylashtirish uchun bog‘ning ilmiy va ekologik monitoring zonasi tarkibiga kiruvchi, to‘qay o‘rmonining tipik namunasi sifatida xarakterlanadigan, biroq mavsumiy toshqinlardan nisbatan xavfsiz bo‘lgan uchastka tavsiya etiladi. Bunday joylashuv, bir tomondan, o‘lchov natijalarining butun to‘qay massiviga vakillik qilishini ta’minlasa, ikkinchi tomondan, uskunaning suv toshqini va mexanik shikastlanishlardan himoyalanishini kafolatlaydi. Meteorologik maydonchani standart talablarga muvofiq — atrofdagi to‘siqlardan (daraxt tojlaridan tashqari) yetarli masofada, ochiq va tekis relyefda tashkil etish lozim, bunda datchiklarning WMO tomonidan tavsiya etilgan standart balandliklarda (harorat va namlik datchigi — 2 metr, anemometr — 10 metr) o‘rnatilishi ta’minlanishi shart.

Kutilayotgan mikroiqlimiy farqlar va ilmiy-amaliy natijalar

Adabiyotlar tahlili va daryo bo‘yi o‘rmon ekotizimlarining umumiy mikroiqlimiy qonuniyatlariga asoslanib, Zarafshon milliy tabiat bog‘i to‘qay zonasida Samarqand shahriga nisbatan kuzatilishi mumkin bo‘lgan taxminiy tendensiyalar 3-jadvalda umumlashtirilgan. Ta’kidlash joizki, bu ko‘rsatkichlar hozircha nazariy-taxminiy xarakterga ega bo‘lib, ularning aniq miqdoriy qiymatlari faqat tavsiya etilayotgan AMS o‘rnatilgach, kamida bir yillik uzluksiz kuzatuv siklidan so‘ng ilmiy asoslangan holda aniqlanishi mumkin.

3-jadval

To‘qay zonasi va Samarqand shahri mikroiqlim ko‘rsatkichlarining kutilayotgan qiyosiy tendensiyasi (nazariy taxmin, empirik tekshirishni talab etadi)

Mikroiqlim ko‘rsatkichi	Samarqand shahri (mavjud AMS ma’lumotlariga asosan, o‘rtacha)	To‘qay zonasida kutilayotgan tendensiya	Kutilayotgan farq yo‘nalishi

Yozgi kunduzgi maksimal harorat	Yuqori, shahar issiqlik oroli ta’sirida	O‘simlik soyasi va bug‘lanish hisobiga pastroq	↓ 1–3 °C
Qishki minimal harorat	Shahar issiqlik oroli ta’sirida nisbatan yumshoq	Ochiq maydonlarga nisbatan sovuqroq bo‘lishi mumkin	↓/↑ (aniqlanishi lozim)
Nisbiy namlik	Nisbatan past	Daryo va o‘simlik transpiratsiyasi hisobiga yuqori	↑ 10–20 %
Shamol tezligi	Nisbatan yuqori, ochiq maydon	O‘rmon qatlami hisobiga sezilarli pasayadi	↓ 30–50 %
Tuproq yuza qatlami harorati	Kuchli kunlik tebranish	Soyalash hisobiga tebranish amplitudasi kamayadi	Amplituda ↓

Tavsiya etilayotgan AMSning joriy etilishi bir qator ilmiy va amaliy natijalarga erishish imkonini beradi: birinchidan, bog‘ hududining haqiqiy mikroiqlim tavsifnomasi ilk bor shakllantiriladi; ikkinchidan, to‘qay o‘simliklari fenologiyasi (bahorgi uyg‘onish, gullash, barg to‘kish muddatlari) bilan mahalliy iqlim ko‘rsatkichlari o‘rtasidagi bog‘liqlikni aniqlash imkoni yaratiladi; uchinchidan, iqlim o‘zgarishi sharoitida to‘qay ekotizimining zaifligini (vulnerability) baholash uchun ilmiy asos vujudga keladi; to‘rtinchidan, yong‘in xavfi yuqori bo‘lgan quruq davrlarni real vaqt rejimida aniqlash va oldini olish tizimini yaratish imkoniyati paydo bo‘ladi; beshinchidan, olingan ma’lumotlar SamDU va boshqa oliy ta’lim muassasalarining geografiya, ekologiya yo‘nalishidagi talaba va magistrantlari uchun amaliy tadqiqot bazasi sifatida xizmat qilishi mumkin.

XULOSA

O‘tkazilgan tahlil shuni ko‘rsatadiki, Zarafshon milliy tabiat bog‘i hududidagi iqlim sharoitini faqat Samarqand shahridagi mintaqaviy AMS

ma’lumotlari asosida baholash metodologik jihatdan yetarli emas, chunki to‘qay ekotizimiga xos zich o‘simlik qatlami, daryo yaqinligi va landshaftning boshqa o‘ziga xos xususiyatlari mahalliy mikroiqlimni sezilarli darajada o‘zgartiradi. Shu sababli, bog‘ hududiga quyosh energiyasi bilan ta’minlangan, real vaqt rejimida ma’lumot uzatuvchi mustaqil avtomatlashtirilgan meteorologik kuzatuv punkti (AMS) o‘rnatish nafaqat ilmiy, balki amaliy jihatdan ham dolzarb va zarur chora hisoblanadi. Tavsiya etilayotgan AMS orqali to‘planadigan uzluksiz ma’lumotlar bog‘ ekotizimining ekologik monitoringini yangi sifat bosqichiga olib chiqadi, iqlim o‘zgarishi sharoitida to‘qay o‘rmonlarining moslashuvchanligini baholash imkonini beradi hamda mintaqaviy iqlimshunoslik va landshaftshunoslik fanlari uchun qimmatli birlamchi ma’lumotlar bazasini yaratadi.

FOYDALANILGAN ADABIYOTLAR RO‘YXATI

1. O‘zbekiston Respublikasi Vazirlar Mahkamasining 2018-yil 7-fevraldagi 82-son qarori. Zarafshon milliy tabiat bog‘ini tashkil etish to‘g‘risida.

2. World Meteorological Organization. Guide to Instruments and Methods of Observation (WMO-No. 8). Geneva: WMO, 2021.

3. Novikova N.M., Ogar N.P. Tugay ecosystems of Central Asia: structure, dynamics and conservation problems. Aridnye ekosistemy, ilmiy jurnal.

4. Rafiqov A.A., Yusupov Sh.Yu. O‘zbekiston tabiiy geografiyasi. Toshkent: O‘zbekiston faylasuflari milliy jamiyati, darslik.

5. Xolmatov P.T. va boshq. O‘zbekiston qo‘riqxonalari va milliy bog‘lari. Toshkent: Fan.

6. Abdulqosimov A. O‘zbekiston landshaftshunosligi. Toshkent: Universitet.

7. O‘zgidromet ma’lumotlari (Samarqand viloyati gidrometeorologiya markazi arxiv materiallari).

8. Ergasheva N. va boshq. To‘qay o‘rmonlari biologik xilma-xilligini saqlashning ekologik-geografik masalalari. Ilmiy-amaliy anjuman materiallari.

9. Xolmanov E.B. Zarafshon milliy tabiat bog‘i hududida ekologik monitoring tizimini takomillashtirish masalalari (qo‘lyozma, SamDU).

THE IMPORTANCE OF WILD PLUM IN NURSERY PRODUCTION

Normukhammad M Mamedov

Doctor of Philosophy of Agricultural Sciences (PhD), Senior Researcher

uzbmamedov@gmail.com

Research Institute of Plant Genetik Resources. Uzbekistan

Abdullaeva M Mavluda

Doctor of Philosophy of Agricultural Sciences (PhD)

mavludaabdullayeva.0278@gmail.com

Research Institute of Plant Genetik Resources. Uzbekistan

Annotation. *The article presents the physical characteristics of wild plum (Prunus spp.) seeds and discusses their potential use in nursery production. The study determined the weight of 1,000 seeds, which is one of the important physical quality indicators of seed material, and highlighted its significance for seedling production. The adaptability of wild plum to local environmental conditions, its potential for seed propagation, and the prospects of using certain forms as rootstocks are also discussed. The findings indicate that the obtained data can serve as a scientific and practical basis for characterizing the initial physical quality of wild plum seeds and assessing their potential use in nursery production.*

Keywords: *wild plum, Prunus spp., seed, 1000-seed weight, seed material, nursery production, rootstock, fruit production, physical quality indicators.*

INTRODUCTION

In fruit production, the cultivation of high-quality and viable planting material is one of the key factors in establishing sustainable orchards. The growth and development of seedlings, their tolerance to adverse environmental conditions, and their subsequent productivity largely depend on the biological characteristics of the rootstock and seed material used. From this perspective, the study of wild fruit species adapted to local environmental conditions and their effective utilization in nursery production is of significant scientific and practical importance.

Wild plum (*Prunus* spp.) is considered one of the valuable genetic resources of fruit trees, with forms adapted to diverse ecological conditions occurring naturally. Their biological characteristics, including the morphological and physical properties of seeds, germination characteristics, early seedling growth, and responses to environmental factors, are considered valuable from the perspective of nursery production.

The possibility of propagating wild plum through seeds, as well as using certain forms as rootstocks, increases its practical importance. In particular, the identification of wild forms adapted to local climatic and soil conditions is important for obtaining high-quality and resilient planting material. In this regard, evaluating physical characteristics such as seed size and weight is considered one of the important criteria for assessing the initial quality of seed material.

Therefore, studying various characteristics of wild plum seeds, including determining the weight of 1,000 seeds, provides initial scientific information for assessing their potential use in nursery production.

Wild cherry (*Prunus avium* L.) is one of the important genetic resources in fruit production and is particularly valuable as a generative rootstock in sweet cherry nursery production. Recent studies have emphasized that rootstocks propagated from *P. avium* seeds can develop strong root systems, adapt to various soil conditions, and exhibit good biological compatibility with grafted cultivated varieties. At the same time, one of the main limitations of generative rootstocks is the genetic and morphological variability among seedlings, which highlights the importance of proper selection of mother trees for seed production [1].

In nursery studies conducted by Świerczyński and Stachowiak, high seedling vigor was observed when *Prunus avium* rootstock was used. The authors compared *P. avium* rootstock with other rootstocks and demonstrated its strong growth characteristics under nursery conditions. These findings indicate the potential for using seeds obtained from wild cherry for the production of high-quality rootstock seedlings [2].

Furthermore, Eroğul emphasized the need to evaluate rootstocks in terms of their responses to soil and temperature conditions, diseases and pests, as well as rootstock–cultivar compatibility in cherry production. This approach indicates that, in addition to the physical characteristics of wild cherry seeds, it is necessary to investigate the growth vigor of seedlings produced from these seeds, their quality as rootstocks, and their compatibility with cultivated cultivars [3].

Data on the thousand-seed weight of *Prunus avium* L. seeds vary among different sources. For example, morphological descriptions of wild cherry seeds report a thousand-seed weight ranging from 125 to 166 g, with an average value of approximately 150 g. It has also been reported that approximately 6,000–8,100 seeds are contained in 1 kg of seed material. [4].

In a study conducted in Romania, 627 seed lots of *Prunus avium* collected over the period from 1973 to 2024 were analyzed. The mean thousand-seed weight was 198.4 g, while the values ranged from 87.9 to 320.0 g. The study also revealed statistically significant differences in thousand-seed weight among different collection years. [5].

MATERIALS AND METHODS

The weight of 1,000 seeds was determined in accordance with the State Standard for Testing Seeds of Agricultural Crops (GOST 12042-80). The seeds were weighed in two replicates of 500 seeds each using a laboratory electronic balance with an accuracy of 0.0001 g.

RESULTS AND DISCUSSION

Wild plum fruits collected in September 2026 from the plum orchard of the Scientific Research Institute of Plant Genetic Resources were used as the research material. The collected fruits were separated from the pulp, washed under running water, and dried in the shade at a temperature of 20–22 °C.

To determine the weight of 1,000 wild plum seeds, two samples of 500 seeds each were separated and weighed using a laboratory balance. The weight of the first replicate was 197.9 g, while the weight of the second replicate was 199.7 g. Thus, the total weight of the two 500-seed samples was 397.6 g.

In the study, particular attention was paid to the weight of 1,000 seeds as one of the physical characteristics used to assess the suitability of wild plum seeds for nursery production. According to the results obtained, the weight of 1,000 wild plum seeds was 397.6 g**.**

The weight of 1,000 seeds is one of the important physical characteristics associated with seed size and fullness. This parameter has practical significance for assessing the overall quality of a seed lot, calculating the required seed rate, and ensuring the efficient use of seed material in nursery production. Therefore, a relatively high weight of 1,000 seeds may provide information about the degree of seed development and the physical condition of the seed material; however, it may not fully reflect seed germination capacity or viability.

The weight of 1,000 wild plum seeds, which was determined to be **397.6 g**, serves as an important initial indicator for assessing the potential use of these seeds as planting material in nursery production. From a nursery production perspective, it is advisable to evaluate this parameter together with other indicators, such as seed germination energy, laboratory and field germination rates, seedling growth rate, and seedling viability.

Since seedlings obtained from wild plum seeds can subsequently be used as rootstocks, the quality of the seed material is of particular importance. The formation of healthy and well-developed seedlings is one of the essential conditions for producing high-quality rootstocks, ensuring successful grafting or budding, and supporting subsequent growth and development.

At the same time, the adaptation of wild plum to natural environmental conditions further enhances its importance as a genetic resource. Therefore, in addition to studying the physical quality characteristics of the seeds, it is important to continue research on the growth vigor of seedlings, root system development, rootstock quality, and compatibility with cultivated varieties.

CONCLUSION.

The weight of 1,000 wild plum seeds was 397.6 g**,** which was recorded as an important parameter characterizing the physical properties of the wild plum

seed material. This result provides a preliminary scientific basis for studying wild plum as a valuable source of seed material and rootstocks for nursery production.

REFERENCES

1. Kovačević, M., et al. (2026). *The role of generative rootstocks of wild cherry, mahaleb and cherry in modern nursery production***.** Sjemenarstvo, 36**(1**–2), 55–68. https://doi.org/10.33128/s1.36.1-2.5

2. Świerczyński, S., & Stachowiak, A. (2012). *Usefulness of four rootstocks and mycorhization treatment in production of sweet cherry maiden trees in a nursery*. Acta Scientiarum Polonorum Hortorum Cultus**.**

3. Eroğul, D. (2012). *The Use of Rootstocks in Cherry Growing*. Adnan Menderes Üniversitesi Ziraat Fakültesi Dergisi, 9(2), 19–24.

4. Otwarta Encyklopedia Leśna. (n.d.). *Czereśnia ptasia – nasiona (Prunus avium L.)*. Otwarta Encyklopedia Leśna.

5. Budeanu, M., Grosu, G., Pepelea, D., & Beșliu, E. (2025). Parametrii calitativi ai semințelor de cireș păsăresc (*Prunus avium* L.) din România. *Revista de Silvicultură și Cinegetică*, 30(56), 40–44.

THERMAL WATERS: NATURAL-GEOGRAPHICAL CHARACTERISTICS, FORMATION PATTERNS, AND HISTORY OF THEIR STUDY

Sobirjonov Muhammadkarim Mahmudjon o‘g‘li

Lecturer at the Department of Natural Geography,

National University of Uzbekistan named after Mirzo Ulugbek

muhammadkarimsobirjonov96@gmail.com

Abstract. *This article analyzes the concept of balneological thermal waters, as well as scientific approaches to their formation and spatial distribution. The significance of temperature criteria, mineralization, chemical components, and dissolved gases in the classification of thermal waters is examined. The article also considers the use of thermal waters for balneological purposes since ancient times and the development of their scientific study during the 18th–20th centuries. The research experience of thermal waters in Europe, North America, and Russia is reviewed, including the scientific contributions of S. Krasheninnikov, A. Ovchinnikov, V. Ivanov, N. Tolstikhin, and other researchers. An analysis of the experience of studying thermal waters provides an important scientific basis for assessing their natural-geographical and hydrogeological significance as balneological resources.*

Keywords: *thermal springs, balneological resources, mineralization, chemical composition, dissolved gases, hydrogeological conditions, balneology, thermal water studies, hydrothermal processes.*

Thermal waters are an important component of the natural environment, distinguished by their high temperature and close relationship with hydrochemical composition and the geological setting. Their formation is primarily determined by geological and structural features, tectonic fractures, hydrogeological conditions, and climatic factors. In this regard, thermal waters represent natural resources of not only hydrogeological importance but also significant balneological and recreational value.

The history of using thermal waters for therapeutic and health-promoting purposes dates back to ancient civilizations. In Ancient Greece and Rome, thermal waters were widely used for bathing and therapeutic practices, while in later

periods, increasing attention was paid to the scientific study of their temperature, chemical composition, and therapeutic properties. The development of research during the 18th–20th centuries expanded the scientific understanding of the mechanisms of thermal-water formation, patterns of their spatial distribution, and their balneological characteristics.

At present, the study of thermal waters is not limited to determining their temperature parameters but requires a comprehensive assessment of their genesis, mineralization, gas and trace-element composition, geological and structural conditions, and balneological potential as natural resources.

INTRODUCTION

Thermal waters (French thermal — warm; Greek thérme — heat) are groundwater resources with temperatures of 20°C or higher within the Earth's crust [1].

The identification of thermal waters is largely based on balneological considerations, as thermal waters with therapeutic properties have been used for medicinal purposes for centuries. From the perspective of traditional human perception, a temperature of 20°C has generally been regarded as the boundary between cold and warm water.

A number of authors rely on climatic characteristics when defining the term "thermal waters." For example, A. Ovchinnikov (1963) proposed distinguishing between relatively thermal waters, whose temperature exceeds the mean annual air temperature of a particular area, and absolutely thermal waters, whose temperature is higher than the normal temperature of the human body. [2].

Thermal waters are generally defined as waters with temperatures higher than the mean annual air temperature of a particular area. According to D. White, thermal waters should have temperatures 5–8.5°C higher than the mean annual temperature of groundwater in the given area [3].

Thermal waters are often mineral waters characterized by a relatively high salt content (1 g/L or more), elevated concentrations of certain components (Fe,

Br, I, B, As, Si, and others), or significant amounts of dissolved gases (CO_2, H_2S, Ra) [4].

The formation of thermal waters is primarily associated with the infiltration of precipitation into deeper horizons through tectonic fractures and permeable rock formations. As depth increases, the temperature of groundwater rises under the influence of the geothermal gradient. After being heated, the water may migrate upward under the influence of density differences and pressure and emerge at the surface in the form of springs or other discharge features.

The formation of thermal waters involves the interaction of geological-lithological, tectonic, hydrogeological, and geothermal factors. In particular, deep tectonic fractures may serve as favorable hydrogeological pathways for the vertical migration of thermal waters. Modern studies conducted in different regions have shown that thermal springs tend to occur in association with major tectonic lineaments, fractures, rift zones, and orogenic regions[1].

Thermal waters commonly occur in areas characterized by complex geological structures, active tectonics, and extensive fracturing. For example, recent hydrogeochemical studies of thermal springs in India have demonstrated their distribution across four major geotectonic settings: orogenic zones, deep fractures, rifts and grabens, and deep sedimentary basins.

This pattern is also of particular significance for intermontane depressions such as the Fergana Valley. The surrounding mountain systems, tectonic discontinuities, and deep hydrogeological structures may create favorable natural conditions for groundwater circulation and the formation of thermal waters. Therefore, in studying the spatial distribution of thermal waters, it is important not only to record the geographical locations of springs but also to determine their relationships with tectonic fractures, relief, and geothermal conditions..

The earliest knowledge of the use of thermal waters for balneological purposes and their therapeutic properties dates back to the early stages of human

[1] Gianfaldoni S., Tchernev G., Wollina U. et al. History of the Baths and Thermal Medicine. Open Access Macedonian Journal of Medical Sciences, 2017, 5(4). –p 566–568

civilization. According to archaeological and written sources, thermal waters were used to treat various diseases in the territories of Egypt, Mesopotamia, and India as early as the 3rd–2nd millennia BCE [5].

In Ancient Greece and Rome, considerable attention was devoted to balneological thermal waters. This is evidenced by the works of Homer (8th century BCE), Herodotus (484–425 BCE), Aristophanes (446–386 BCE), Pliny the Elder (23–79 CE), and other authors, as well as by the remains of numerous structures built for the use of thermal waters in Greece, Italy, Spain, France, Romania, Bulgaria, and other countries[2].

Hippocrates (460–370 BCE) devoted a substantial section of his work to thermal waters, in which he described their chemical and organoleptic properties, as well as the effects of hot and cold baths on the human body. He proposed the hypothesis that all human diseases originate from an imbalance of bodily fluids [1].

Although the use of thermal waters originated in Ancient Greece, it reached its peak during the Roman Empire. Inspired by the Greeks, the Romans regarded bathing as a regular practice for maintaining health.[3].

During the Middle Ages, the general stagnation in the development of science and culture worldwide also affected the study and use of thermal waters.

Abu Ali ibn Sina (980–1037) considered water to be one of the fundamental factors influencing human life and health. He regarded water not merely as a liquid that quenches thirst, but also as a means of maintaining metabolic processes in the human body. His views on thermal and mineral waters had a significant influence on medicine in subsequent centuries, and his work *Al-Qanun fi al-Tibb (The Canon of Medicine)* was used in Europe as a major medical textbook until the 17th century[4].

[2] Е.А.Басков, С.Н.Суриков. Гидротермы Земли. Ленинград «НЕДРА» 1989- 46 с.
[3] Cilliers L, Retief FP. Medical practice in Graeco-roman antiquity. Curationis. 2006; 29:34-40. https://doi.org/10.4102/curationis.v29i2.
[4] Nimrouzi, M., Tafazoli, V., Daneshfard, B., & Zare, M. (2016). Optimal fluid intake in daily diet: Avicenna's view. Journal of Integrative Medicine, 14(4), 241–244. https://doi.org/10.1016/S2095-4964(16)60262-5

By the 18th century, numerous publications on the chemical composition of thermal waters began to appear in Europe.

In 1703, the Belgian physician and balneologist J. Bresmal (1660–1724) published a work devoted to the scientific analysis of the famous thermal mineral springs of Aachen, Germany.

Between 1735 and 1740, the Russian traveler S. Krasheninnikov investigated numerous thermal springs in the Kamchatka region and provided relatively detailed descriptions of them. In particular, he also studied several geysers [2].

In 1740, the English physician and naturalist T. Short (1690–1772) published works devoted to the study of the characteristics of various mineral and thermal water sources in England. His works and studies on mineral waters contain information on therapeutic springs located in different regions of England. In his research, T. Short described the effects of the famous mineral water sources of Bath, Harrogate, and Epsom on the human body, as well as the possibilities of using these waters for therapeutic purposes [6].

In 1761, the German naturalist and physician H. Troschel conducted research on the famous thermal springs of Teplice in Bohemia and published information on their physical properties, temperature, and therapeutic applications.

In 1772, the Czech physician and chemist D. Becher (1725–1792) published his fundamental research on the thermal waters of Karlsbad. In his studies, he analyzed the chemical composition and temperature of the Karlsbad mineral waters, their gas content, and methods of therapeutic use. His scientific approach contributed to the development of Karlsbad into one of the most prominent balneological centers in Europe by the end of the 18th century [7].

During the 19th century and the first half of the 20th century, major studies of thermal waters in Western Europe were conducted primarily in connection with their therapeutic applications. Particular attention was devoted to the thermal waters of well-known spa resorts, including Vichy, Mont-Dore, Cnesse, La

Bourboule, and Le Boulou in France; Aachen, Baden-Baden, Ems, and Nauheim in Germany; Karlsbad, Teplitz-Schönau, and Trencsén-Teplice in Czechoslovakia; Baden and Franzensbad in Austria; Bagnoli, Abano, Battaglia, and Valdnerz in Italy; Archena, Carratraca, and Arendimo in Spain; and Vidago and Gerez in Portugal, among others [8].

In the 19th century, general works on the mineral and thermal waters of Western Europe were subsequently published by A. B. Granville, J. Macpherson, L. De Launay, and other researchers.

It should also be noted that De Launay classified thermal springs into two categories: vein and stratum types. In his view, the former represented the actual conduits of thermal water, whereas the latter referred to stratified thermal horizons capable of forming natural outlets of thermal water or being artificially tapped by wells [11].

The scattered and still relatively limited information on the thermal waters of Africa was first compiled by L. De Launay (1903). A substantial amount of new material on the thermal waters of Africa was subsequently edited and published by G. Kachura (1959–1965). The main patterns of spatial distribution of the most important types of mineral and thermal waters in Africa were first studied by R. Tkachenko, L. Flerova, and N. Marinov [9]

At the end of the 19th and the beginning of the 20th century, the rapid development of the western United States and Canada also stimulated increased attention to the study of thermal waters. By the beginning of the 20th century, the major thermal springs of the western United States, including those in California, Nevada, Utah, Idaho, Oregon, and other states, had been described, and their principal chemical compositions had been investigated[5].

[5] Собиржонов М.М. БАЛНЕОЛОГИК ТЕРМАЛ СУВЛАРНИНГ ТАБИИЙ РЕСУРС СИФАТИДА ШИФОБАХШ ХУСУСИЯТЛАРИ ВА ИЛМИЙ АСОСЛАРИ. O‘zbekistondagi ilmiy yangiliklar jurnali Vol. 2 No. 4 (2026): 192-197 б. https://globalsciences.uz/ilmiyyangiliklar/article/view/3592

At the beginning of the 19th century, the accumulated data on the thermal waters of North America were periodically compiled and summarized by J. Bell, J. Moorman, G. Walton, and other researchers.

In Russia, the study of thermal waters for therapeutic purposes began in the 18th century. Expeditions organized by the Academy of Sciences investigated thermal waters in Kamchatka (S. Krasheninnikov) and the North Caucasus (P. Güldenstädt and P. Pallas). During the 19th century and the beginning of the 20th century, extensive data on the occurrence of thermal and mineral waters were collected in various regions of Russia, including the Caucasus, Kamchatka, Transbaikalia, Central Asia, and other areas as a result of numerous studies.

In the 1920s–1940s, research on thermal waters continued in the Caucasus (A. Gerasimov, N. Ogilvie, N. Slavyanov, A. Ovchinnikov, A. Demyokhin, V. Kukanov, E. Karstens, I. Panteleev, N. Pogorelsky, and N. Grigoriev), the Pamirs and Tien Shan (I. Prokopenko and L. Komlev), the Kopet Dag (I. Nikshich and others), as well as Eastern Siberia, the northeastern regions of Russia, and the Russian Far East (N. I. Tolstikhin, V. V. Ivanov, and A. I. Kalabin). During this period, extensive information was also accumulated on thermal groundwater in several artesian basins of the Russian Platform and other regions. These data were subsequently summarized in the works of N. Tolstikhin and N. Ignatovich.

t is also important to highlight the significant studies conducted by A. Ovchinnikov on the regionalization of thermal waters in folded regions, particularly in the Caucasus. The distribution and formation of the principal types of thermal waters are comprehensively described in A. Ovchinnikov’s book Mineral Waters [2].

Among the other studies on the thermal waters of Russia, particular mention should be made of the works of B. Mavritsky (1962, 1975), V. Ivanov (1960), K. Bogoroditsky (1968), I. Zaitsev and N. Tolstikhin (1972), V. Kononov (1965), E. Pinneker (1965), G. Bogomolov (1972), I. Buachidze (1980), A. Shcherbakov (1968), E. Posokhov (1977), and others.

In Russia, carbonic thermal springs are used at the resorts of Pyatigorsk, Zheleznovodsk, and Yessentuki. Hydrogen sulfide thermal springs are utilized at the Sochi–Matsesta resort, while fresh nitrogen-rich springs with high silica content are used at such well-known resorts as Belokurikha in Altai and Kuldur in Khabarovsk Krai, among others [11].

The balneological thermal waters (springs) discussed above are widely used for therapeutic purposes in various regions of the world. Some of the most well-known areas include the following (Table 1).

Table 1

Countries with extensive use of balneological thermal waters

o.	**Country**	**Famous Resorts**	**Water Composition**	**Water Temperature** (°C)
.	Germany	Baden-Baden, Wiesbaden, Bad Kissingen	Sulfate, bicarbonate	47–68
.	France	Vichy, Évian-les-Bains, Contrexéville	Calcium-magnesium bicarbonate	14–60
.	Italy	Saturnia, Abano Terme, Ischia	Hydrogen sulfide, iodide, sodium-rich	37–80
.	Czech Republic	Karlovy Vary, Mariánské Lázně, Františkovy Lázně	Sodium bicarbonate-sulfate	30–73
.	Russia	Kislovodsk, Pyatigorsk, Yessentuki, Zheleznovodsk	Sulfate, sodium bicarbonate	20–60
.	Hungary	Budapest (Gellért, Széchenyi), Hévíz	Radon, thermal, sulfate-rich	30–76
.	Japan	Beppu, Hakone, Kusatsu	Hydrogen sulfide, iron-rich, carbonate	40–100
.	Spain	Caldes de Malavella, Archena, Mondariz	Calcium-magnesium sulfate	35–56

.	Switzerland	Leukerbad, Bad Ragaz, Scuol	Siliceous, thermal, bicarbonate	32–51
0.	Georgia	Borjomi, Sairme, Nabeglavi	Sodium bicarbonate, carbonate	17–38

Note: The table was compiled by the author based on data from the World Health Organization (WHO) and electronic sources, including baden-baden.com, thermesdevichy.com, termedisaturnia.it, karlovyvary.cz

CONCLUSIONS

Thermal waters are important balneological resources formed under the influence of natural geological and hydrogeological processes and distinguished by their temperature and hydrochemical composition. The history of their study began with practical experience in ancient times and acquired a scientific basis during the 18th–20th centuries as a result of the development of physicochemical, hydrogeological, and balneological research. Studies conducted in different regions have demonstrated that the distribution and characteristics of thermal waters are closely associated with geological structure, tectonic processes, hydrogeological conditions, and the geothermal regime. Therefore, a comprehensive study of thermal waters provides an important scientific basis for assessing their origin, spatial distribution, therapeutic properties, and balneological potential.

REFERENCES

1. Макаренко Ф.А. Изучение и использование глубинного тепла Земли. Москва: Наука. 1973. 327 с.
2. Овчинников А.М. Минеральные воды (учение о месторождениях минеральных вод с основами гидрогеохимии и радиогидрогеохимии). - Москва, Госгеолтехиздат. 1963. 375 с.
3. Уайт Д.Е. Термальные воды вулканического происхождения. Геохимия современных поствулканических процессов. – Москва: Мир, 1965. –78–100 с.
4. Жарков Р.В. Термальные источники Южных Курильских островов. Владивосток: Дальнаука, 2014. – 9 с.
5. Иванов В.В. Геотермальные ресурсы и их использование в курортном деле СССР. Москва: Наука, 1985. 67-73 с.
6. Short T. An Essay towards a Natural and Medicinal History of the Principal Mineral Waters of England. – Sheffield, 1740. – p 330.
7. Hlawiczka, S. (1991). The History of Balneology and Spa Medicine in Central Europe. Ceskoslovenská Patologie, 27(3), 145–152.

8. Басков Е.А., Суриков С. Н. Гидротермы Земли. — Ленинград: Недра, 1989. - 328 с.

9. Sobirjonov M.M. BALNEOLOGICAL RESOURCES AND ISSUES OF THEIR USE. INTERNATIONAL SCIENTIFIC JOURNAL: LEARNING AND TEACHING, (2026) 3(1), 44–69. https://zenodo.org/records/18314501

10. Allen E.T., Day A.L. Hot Springs of the Yellowstone National Park. Carnegie Inst., Washington, pub. 466, 1935. - p 525.

11. Маврицкий Б.Ф. Термальные воды складчатых и платформенных областей СССР. Москва: Наука, 1971. 242 с.

12. Sobirjonov M.M. THE THERAPEUTIC PROPERTIES OF NATURAL CLIMATIC CONDITIONS (MICROCLIMATE) AND THE SCIENTIFIC BASIS FOR THEIR USE. Экономика и социум 2026. 5-2 (144) 597-603. https://cyberleninka.ru/article/n/the-therapeutic-properties-of-natural-climatic-conditions-microclimate-and-the-scientific-basis-for-their-use/viewer

13. Собиржонов М.М. БАЛНЕОЛОГИК ТЕРМАЛ СУВЛАРНИНГ ТАБИИЙ РЕСУРС СИФАТИДА ШИФОБАХШ ХУСУСИЯТЛАРИ ВА ИЛМИЙ АСОСЛАРИ. O‘zbekistondagi ilmiy yangiliklar jurnali Vol. 2 No. 4 (2026): 192-197 б. https://globalsciences.uz/ilmiyyangiliklar/article/view/3592

14. Internet information sources.

HYGIENIC ASSESSMENT OF WORKING CONDITIONS AND PRODUCTION ENVIRONMENT FACTORS FOR THERMAL POWER PLANT WORKERS

Feruzaxon Ne'matjonovna Qadirjanova

Fergana Medical Institute of Public Health (Fergana, Uzbekistan)

Email: f33245237@gmail.com

Abstract: *This study evaluated the production environment factors and working conditions of key occupational groups at an energy enterprise, using the Fergana Thermal Power Plant (TPP) as an example. Microclimate parameters, noise, whole-body vibration, and dust concentration levels were assessed using instrumental and laboratory methods across 15 workplaces in five main departments. In the turbine and boiler departments, acoustic loads were consistently above permissible exposure limits (equivalent noise level reached 82.4 dBA, with peak maximum levels up to 98 dBA).The study established that the combined and synergistic effects of these occupational hazards significantly increase the risk of developing work-related pathologies.*

Keywords: *thermal power plant, Fergana TPP, working conditions, hygienic assessment, noise, whole-body vibration, microclimate, dust concentration, occupational risk.*

INTRADUCTION

The energy sector constitutes a foundational pillar of the national economy, with its operational continuity primarily ensured by thermal power plants and combined heat and power plants (TPPs/CHPs). The generation of electrical and thermal energy involves the operation of complex technical systems, characterized by exposure to high temperatures and pressures, as well as the release of intense mechanical and acoustic energy. Despite ongoing efforts to modernize technological processes and integrate alternative energy sources, a complex set of harmful factors—including noise, vibration, adverse microclimate, dust, and gases—persist in the workplace zones of primary and auxiliary departments (Pankov & Kuleshova, 2019; Adilov, 2017).

Prolonged exposure to industrial environmental factors reduces workers' occupational capacity, negatively impacts the functional status of the central

nervous, cardiovascular, and respiratory systems, and increases the risk of occupational diseases and temporary disability (Volgareva et al., 2017; Qadirjanova, 2025). Therefore, a comprehensive hygienic assessment of working conditions and hazard identification among the main occupational groups at the Fergana TPP, a major energy enterprise, holds high scientific and practical importance. The objective of this study is to compare physical and chemical factors in the workplace zones against current standards, establish hazard classes for working conditions, and evaluate occupational risk levels.

MATERIALS AND METHODS

JSC "Fergana Thermal Power Plant," established in 1956, was selected as the research object. The enterprise has an installed electrical capacity of 305 MW and a thermal capacity of 120.46 Gcal/h, housing 12 power boilers and 6 turbine generators. Observations were conducted across 15 permanent and temporary workplaces within five main operational departments: the boiler department, turbine department, fuel and transport department (FTD), wastewater distillate preparation department (WDPD), and the electrical department.

Microclimate parameters (air temperature, relative humidity, and air velocity) were measured during both warm and cold seasons throughout shifts in accordance with Sanitary Rules and Norms (SanRN) No. 0324-16. Noise levels were studied pursuant to GOST 12.1.050-86 using a "Sh-63" sound level meter and spectrum analyzer, and evaluated according to SanRN No. 0325-16 and SanRN No. 0111-26 criteria. Whole-body vibration levels were determined within the framework of current hygienic standards. Air dustiness in the working zone was sampled using AFA-VP-10 analytical ribbon filters with an aspiration device and analyzed gravimetrically on analytical balances; the results were compared against SanRN No. 0294-11 and GOST 12.1.005-88 standards. Safety levels and hazard classes of working conditions were classified in accordance with SanRN No. 0141-03.

RESULTS AND DISCUSSION

At the Fergana TPP, electrical and thermal energy is generated through a combined cycle (cogeneration) process. The primary fuel used is natural gas, with M-40 fuel oil serving as a reserve; additionally, treated refinery gases from the adjacent oil refinery are utilized (~390 thousand m³ per month), while coal usage was entirely phased out in 1995. In recent years, an additional 100 MW turbine, cogeneration gas turbine units (17 MW and 7 MW), and a 3.1 MW solar photovoltaic power station have been commissioned. Despite these modernizations, morally and physically obsolete equipment remains operational in the engine rooms: the operating lifespan of TG-1 has exceeded 299 thousand hours, and the overhaul interval for the cooling towers stands at 17 years. This exact condition creates the prerequisite for increased intensity of physical hazards.Analysis of acoustic loads indicated that noise levels at the workplaces of all primary occupational groups exceed current sanitary standards .In the boiler and turbine departments, equivalent and maximum noise levels fluctuated within the ranges of 80–82.4 dBA and 90–98 dBA, respectively. The highest level was recorded in the turbine department at the working environment of the TG-4-7 steam turbine operator (98 dBA)—exceeding the permissible exposure limit by 18 dBA. Although the acoustic load at the permanent workplaces of boiler department staff was relatively lower (90–95 dBA), it consistently exceeded standard limits. Frequency spectrum analysis revealed that sound energy was evenly distributed across low, medium, and high-frequency ranges. In the FTD and WDPD departments, noise loads also ranged between 80 and 98 dBA; acoustic vibrations were characterized by low- and medium-frequency profiles and non-steady-state dynamic behavior over time (Abdullayeva, 2023).

Table 1.

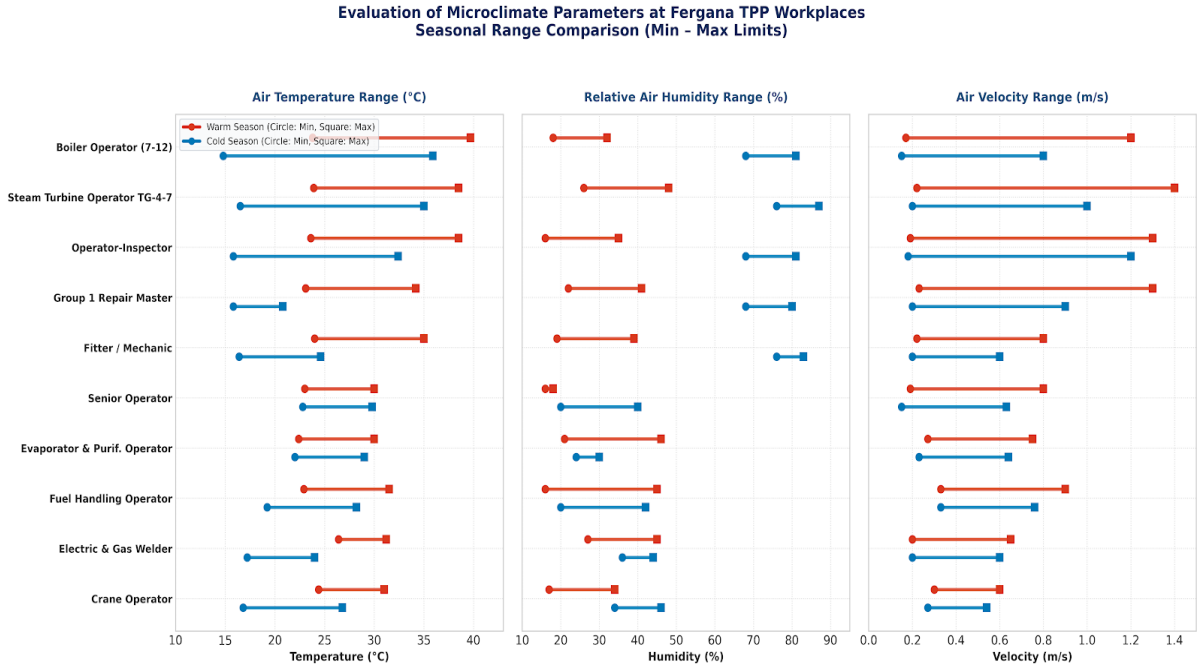
Whole-body vibration parameters at key workplaces in the turbine department

Job Title (Workplace)	Hygienic Standard, dB	Measured Result, dB	Hazard Class
Crane operator	101	104	3.1

Steam turbine operator (TG-4-7)	92	94	3.1
Fitter / Repairman	92	95	3.1
Electric and gas welder	109	112	3.2

Instrumental measurements confirmed that whole-body vibration levels exceeded normative standards at all four key workplaces in the turbine department. The highest absolute excess was observed at the workplaces of the crane operator, fitter, and electric-gas welder—exceeding the standard by 3 dB—while for the steam turbine operator, it was +2 dB. Three workplaces were classified under hazard class 3.1; although vibration at this level induces physiological changes, the body retains the capacity to recover provided that rest schedules are observed. The electric and gas welder workplace demonstrated the highest absolute level (112 dB) and was assigned to hazard class . The microclimate parameters at the workplaces of the studied professions, taking into account the seasonality factor, are detailed in figure 2.

Figure 2.The microclimate parameters at the workplaces of the Fergana Thermal Power Plant (TPP) were evaluated based on the limit fluctuations (maximum and minimum indicators: max–min) determined across the warm and cold periods of the year.



The obtained data indicate that due to convective and radiant heat release in the boiler and turbine workshops during the warm season, the air temperature rises up to 38.5–39.7 °C, creating heating microclimate conditions. In the cold season, however, a temperature drop down to 2.0 is observed in certain open areas of the WTP (Water Treatment Plant) workshop. During the winter period, a sharp increase in relative humidity in the boiler (68–81\%) and turbine (76–87\%) workshops, combined with low/moderate temperatures, complicates the body's

thermoregulation process. Hygienic analysis indicates that production factors at the Fergana TPP do not act in isolation, but rather in a combined and synergistic (mutually reinforcing) manner. High temperatures (38–39°C) combined with dusty conditions accelerate respiration and perspiration, which increases the absorption of subdisperse dust and gases (NOx, SO2,CO) into deep tissues via the respiratory mucosa by 1.5–2 times.The combined effect of 85–98 dBA noise, carbon monoxide, and nitrogen oxides exerts a dystrophic impact on the central and autonomic nervous systems.

CONCLUSIONS

The working conditions in the main departments of the Fergana TPP are characterized by a complex of harmful occupational factors, including an unfavorable microclimate, high levels of noise and vibration, and air dust contamination in the workplace area. Noise levels at the workplaces are consistently above permissible exposure limits, reaching a maximum of 98 dBA at the steam turbine operator's workplace (harmful working conditions class 3.3). The overall vibration level in the turbine department exceeds the standard limit by 2–3dB, corresponding to harmful classes 3.1–3.2.

REFERENCES

1. SanQvaM No. 0324-16. Sanitary and Hygienic Standards for Microclimate in Industrial Premises. – Tashkent, 2016.
2. SanQvaM No. 0325-16. Hygienic Standards for Permissible Noise Levels in the Workplace. – Tashkent, 2016.
3. Abdullayeva N. Assessment of noise levels in Thermal Power Plants of Uzbekistan // Central Asian Journal of Environmental Health. – 2023. – Vol. 5, No. 2. – Pp. 45–52.
4. Adilov U.Kh. Experience in assessing the working conditions of workers in the fuel and energy complex based on workplace certification materials // Occupational Medicine and Industrial Ecology. – 2017. – No. 9. – P. 5.
5. Adilov U.Kh., Khashirbaeva D.M., Akhmedova M.B. Use of information technologies in forecasting and managing occupational risks // Russian Hygiene – Developing Traditions, Striving into the Future: Proc. Sci.-Prac. Conf. – Moscow, 2017. – Pp. 442–445.
6. Volgareva A.D. et al. Occupational noise as a professional risk factor at petrochemical enterprises // Health Risk Analysis. – 2017. – No. 1. – Pp. 116–124.
7. Pankov V.A., Kuleshova M.V. Assessment of working conditions, health status, and occupational risk of workers in thermal power engineering enterprises // Hygiene and Sanitation. – 2019. – Vol. 98, No. 7. – Pp. 766–770.
8. Qadirjanova F.N. Impact of working conditions in thermal power plant enterprises on workers' health // Journal of Humanities and Natural Sciences. – 2025. – No. 24. – Pp. 20–22.
9. Yeasmin S. et al. Assessing radioactivity and hazards: analysis of soil, water, and coal samples near a coal-fired thermal power plant and their implications for human health and the

environment // International Journal of Environmental Analytical Chemistry. – 2025. – Vol. 105, No. 3. – Pp. 618–635.
10. Rao L.L. et al. Effect of perceived risk on nuclear power plant operators' safety behavior and errors // Journal of Risk Research. – 2017. – Vol. 20, No. 1. – Pp. 76–84.

ATMOSFERA HAVOSI IFLOSLANISHINING O‘SMIR O‘G‘IL BOLALAR ORGANIZMIGA KOMPLEKS TA’SIRI

Mirzaxmedova Muxarram

Tayanch doktorant (PhD)

mirzaahmedovamuharram@gmail.com

Sanitariya gigiyena va kasb kasalliklari ilmiy tadqiqot instituti

Annotatsiya. *Mazkur tadqiqot ishida atmosfera havosi ifloslanishining bolalar va o‘smirlar salomatligiga ta’siri zamonaviy ilmiy manbalar asosida yoritilgan. Havo ifloslantiruvchilarining nafas olish, yurak-qon tomir, asab va endokrin tizimlarga, shuningdek, jismoniy rivojlanish va pubertat jarayonlariga ehtimoliy ta’siri tahlil qilingan. Mavjud ma’lumotlar ushbu ta’sirlarning yosh va jinsga qarab farqlanishi mumkinligini ko‘rsatadi. Ayniqsa, o‘smir o‘g‘il bolalarda atmosfera ifloslanishining salomatlik ko‘rsatkichlariga kompleks ta’sirini o‘rganish dolzarb yo‘nalishlardan biri hisoblanadi.*

Kalit so‘zlar: *atmosfera havosi ifloslanishi, bolalar, o‘smirlar, $PM_{2.5}$, PM_{10}, NO_2, salomatlik, pubertat.*

Abstract. *This study examines the effects of ambient air pollution on the health of children and adolescents based on contemporary scientific literature. The potential effects of air pollutants on the respiratory, cardiovascular, nervous, and endocrine systems, as well as on physical development and pubertal processes, are analyzed. Available evidence indicates that these effects may vary depending on age and sex. In particular, studying the comprehensive impact of ambient air pollution on health indicators in adolescent boys represents one of the relevant areas of current research.*

Keywords: *ambient air pollution, children, adolescents, $PM_{2.5}$, PM_{10}, NO_2, health, puberty.*

Tadqiqotning maqsadi. Atmosfera havosining ifloslanishining aholining sezgir guruhi bo‘lgan bolalar, xususan, maktab yoshidagi o‘g‘il bolalar salomatligiga ta’siriga bag‘ishlangan mahalliy va xorijiy ilmiy ma’lumotlarni yosh, jins va asosiy ifloslantiruvchi moddalarning o‘ziga xos xususiyatlarini hisobga olgan holda tahlil qilish va umumlashtirish.

Materiallar va usullar.

PubMed, Scopus, Web of Science, Google Scholar bazalari, WHO va State of Global air hisobotlaridagi zamonaviy ilmiy manbalar tahlil qilindi. Tahlil, taqqoslash, umumlashtirish usullaridan foydalanildi.

NATIJALAR VA MUHOKAMA.

Zamonaviy ilmiy ma'lumotlar atmosfera havosidagi zararli moddalar bolalar organizmiga bir vaqtning o'zida bir necha yo'nalishda ta'sir qilishi mumkinligini ko'rsatadi. Bolalik va o'smirlik davrida organizmning faol o'sishi va funksional tizimlarning shakllanishi tashqi muhit omillariga sezuvchanlikni oshiradi. Shu sababli $PM_{2.5}$, PM_{10} va NO_2 kabi asosiy ifloslantiruvchilarning uzoq muddatli ta'siri bolalarda nafas olish tizimi faoliyatining buzilishi, bronxial astma va allergik kasalliklar bilan bog'langan [1,2,3].

Havo ifloslantiruvchilarining organizmga ta'siri nafas olish tizimi bilan chegaralanib qolmaydi. Mayda dispers zarrachalarning o'pka orqali kirishi yallig'lanish jarayonlarini kuchaytirib, qon tomirlar faoliyati va yurak-qon tomir tizimining funksional holatiga ta'sir ko'rsatishi mumkin [4,5]. Shu bilan birga, $PM_{2.5}$, PM_{10} va NO_2 ta'siri arterial qon bosimi, yurak ritmi va yurakning bioelektrik faoliyatidagi ayrim o'zgarishlar bilan bog'langan [6,7]. Bu ma'lumotlar havo ifloslanishining bolalar salomatligiga ta'siri alohida organ bilan cheklanmasligini ko'rsatadi.

Atmosfera ifloslanishiga javoban yuzaga keladigan yallig'lanish va oksidlovchi stress jarayonlari asab tizimi faoliyatiga ham ta'sir qilishi ehtimoli mavjud. Ayniqsa, rivojlanayotgan markaziy asab tizimi tashqi muhitning uzoq muddatli ta'sirlariga nisbatan sezgir bo'lishi mumkin. Tadqiqotlarda havo ifloslanishiga yuqori darajada duch kelgan bolalarda diqqat, ishchi xotira va ayrim kognitiv ko'rsatkichlarning pasayishi qayd etilgan [8,9,10]. Ayrim tizimli sharh va meta-tahlillarda $PM_{2.5}$ ta'siri IQ ko'rsatkichlari, o'rganish qobiliyati va ayrim neyrorivojlanish buzilishlari bilan bog'liq bo'lishi mumkinligi ko'rsatilgan [11].

Organizmning rivojlanish jarayonlari faqat nerv tizimi bilan emas, balki gormonal va metabolik boshqaruv bilan ham chambarchas bog'liq. Shu sababli so'nggi tadqiqotlarda atmosfera havosi ifloslanishining endokrin-metabolik

jarayonlarga ta’siriga ham e’tibor qaratilmoqda. $PM_{2.5}$, PM_{10}, NO_2, SO_2 va O_3 ta’siri insulin rezistentligi, tana massasi, semizlik, qalqonsimon bez faoliyati va boshqa metabolik ko‘rsatkichlar bilan bog‘liqligi haqida ma’lumotlar mavjud [12,13]. Ayrim tadqiqotlarda O_3 va NO_2 ta’siri 1-tip qandli diabet hamda insulin rezistentligi ko‘rsatkichlari bilan bog‘langan [14]. Prenatal va erta bolalik davridagi $PM_{2.5}$ ekspozitsiyasining qalqonsimon bez gormonlari o‘zgarishi bilan bog‘liqligi ham qayd etilgan [12].

Endokrin tizimdagi o‘zgarishlar o‘smirlik davridagi biologik yetilish jarayonlari bilan bevosita bog‘liq bo‘lgani sababli, atmosfera ifloslanishining pubertatga ehtimoliy ta’siri alohida ahamiyatga ega. Mavjud ma’lumotlar bu borada yagona xulosaga kelishga imkon bermaydi: ayrim tadqiqotlarda jinsiy yetilishning kechikishi, boshqalarida esa erta boshlanishi kuzatilgan [15,16,17]. Prenatal va erta hayot davrida PM_{10}, SO_2 va NO_2 ta’siri ayrim guruhlarda Tanner bosqichlarining o‘zgarishi bilan bog‘langan va ushbu bog‘liqlik jinsga qarab farqlanishi mumkin [15,16]. Shu bilan birga, ayrim tadqiqotlarda $PM_{2.5}$, PM_{10} va NO_2 ning erta pubertat bilan bog‘liqligi aniqlangan bo‘lsa, boshqalarida bunday munosabat tasdiqlanmagan [17].

Shunday qilib, mavjud adabiyotlar atmosfera havosi ifloslanishi bolalar organizmida bir-biri bilan bog‘liq bo‘lgan nafas olish, yurak-qon tomir, asab va endokrin jarayonlarga ta’sir qilishi mumkinligini ko‘rsatadi. Ta’sirning namoyon bo‘lishi ifloslantiruvchi moddaning turi va konsentratsiyasi bilan bir qatorda, ekspozitsiya davomiyligi, bolaning yoshi, jinsi va individual xususiyatlariga ham bog‘liq. Ayniqsa, o‘smirlik davrida jismoniy va jinsiy rivojlanishning faol kechishi ushbu yosh guruhini alohida o‘rganishni talab qiladi.

Mavjud tadqiqotlarda o‘g‘il bolalarning atmosfera ifloslanishiga javobi, xususan, ularning jismoniy rivojlanishi, funksional holati va pubertat ko‘rsatkichlari bo‘yicha ma’lumotlar nisbatan cheklangan va natijalar bir xil emas. Shu bois turli ekologik sharoitlarda yashovchi o‘smir o‘g‘il bolalarda atmosfera havosi ifloslanishining organizmning funksional holati, jismoniy rivojlanishi va

reproduktiv salomatligi bilan bog‘liqligini kompleks baholash dolzarb ilmiy yo‘nalishlardan biri hisoblanadi.

XULOSA

Adabiyotlar tahlili atmosfera havosining ifloslanishi bolalar va o‘smirlar salomatligiga ko‘p tizimli ta’sir ko‘rsatib, ayniqsa nafas olish, yurak-qon tomir, asab va endokrin tizimlar faoliyatida o‘zgarishlarga sabab bo‘lishi mumkinligini ko‘rsatdi. Havo ifloslanishining ta’siri yosh va jinsga qarab farqlanishi mumkinligi sababli, o‘smir o‘g‘il bolalarda jismoniy rivojlanish, funksional holat va reproduktiv salomatlik bilan bog‘liq jihatlarni chuqur o‘rganish dolzarb hisoblanadi. Mavjud ilmiy ma’lumotlardagi tafovutlarni hisobga olgan holda, ushbu yo‘nalishda kompleks va qo‘shimcha tadqiqotlar olib borish zarur.

FOYDALANILGAN ADABIYOTLAR

1. Bowatte G, Lodge C, Lowe AJ, Erbas B, Perret J, Abramson MJ, et al. The influence of childhood traffic-related air pollution exposure on asthma, allergy and sensitization: a systematic review and a meta-analysis of birth cohort studies. *Allergy*. 2015;70(3):245-256. doi:10.1111/all.12561.
2. Schultz E.S., Hallberg J., Bellander T., et al. Early-life exposure to traffic-related air pollution and lung function in adolescence. Am J Respir Crit Care Med. 2016;193(2):171-177. doi:10.1164/rccm.201505-0928OC.
3. Urrutia-Pereira M., Guidos-Fogelbach G., Solé D. Climate changes, air pollution and allergic diseases in childhood and adolescence. Jornal de Pediatria. 2022;98(Suppl 1):S47-S54. doi:10.1016/j.jped.2021.10.005
4. Huang M., Chen J., Yang Y. et al. Effects of Ambient Air Pollution on Blood Pressure Among Children and Adolescents: A Systematic Review and Meta-Analysis. J Am Heart Assoc. 2021;10(10):e017734. doi:10.1161/JAHA.120.017734.
5. Macchi C., et al. Pollution from fine particulate matter and atherosclerosis: A narrative review. Environ Int. 2023;173:107923. doi:10.1016/j.envint.2023.107923.
6. He F., Yanosky J.D., Fernandez-Mendoza J., Chinchilli V.M. et al. Acute Impact of Fine Particulate Air Pollution on Cardiac Arrhythmias in a Population-Based Sample of Adolescents: The Penn State Child Cohort. Journal of the American Heart Association. 2022;11(18):e026370. doi:10.1161/JAHA.122.026370.
7. Huang M., Chen J., Yang Y. et al. Effects of Ambient Air Pollution on Blood Pressure Among Children and Adolescents: A Systematic Review and Meta-Analysis. J Am Heart Assoc. 2021;10(10):e017734. doi:10.1161/JAHA.120.017734.
8. Herting M.M., Bottenhorn K.L., Cotter D.L. Outdoor air pollution and brain development in childhood and adolescence. Trends in Neurosciences. 2024;47(8):593-607. doi:10.1016/j.tins.2024.06.008
9. Lin L-Z, Zhan X-L, Jin C-Y, Liang J-H, Jing J, Dong G-H. The epidemiological evidence linking exposure to ambient particulate matter with neurodevelopmental disorders: A systematic review and meta-analysis. Environmental Research. 2022;209:112876. doi:10.1016/j.envres.2022.112876.

10. Yuan A., Halabicky O., Rao H., Liu J. Lifetime air pollution exposure, cognitive deficits, and brain imaging outcomes: A systematic review. NeuroToxicology. 2023;96:69-80. doi:10.1016/j.neuro.2023.03.006.

11. Alter N.C., Whitman E.M., Bellinger D.C., Landrigan P.J. Quantifying the association between $PM_{2.5}$ air pollution and IQ loss in children: a systematic review and meta-analysis. Environmental Health. 2024;23(1):101. doi:10.1186/s12940-024-01122-x.

12. Heo Y.J., Kim H.S. Ambient air pollution and endocrinologic disorders in childhood. Annals of Pediatric Endocrinology & Metabolism. 2021;26(3):158-170. doi:10.6065/apem.2142132.066.

13. Huang C., Li C., Zhao F., Zhu J., Wang S., Sun G. The Association between Childhood Exposure to Ambient Air Pollution and Obesity: A Systematic Review and Meta-Analysis. International Journal of Environmental Research and Public Health. 2022;19(8):4491. doi:10.3390/ijerph19084491.

14. Elten M., Donelle J., Lima I. et al. Ambient air pollution and incidence of early-onset paediatric type 1 diabetes: A retrospective population-based cohort study. Environmental Research. 2020;184:109291. doi:10.1016/j.envres.2020.109291.

15. Oh J., Choi J.E., Lee R., Mun E., Kim K.H., Lee J.H., Lee J., Kim S., Kim H.S., Ha E. Long-term exposure to air pollution and precocious puberty in South Korea. Environ Res. 2024;252(Pt 2):118916. doi:10.1016/j.envres.2024.118916.

16. Lee R., Oh J., Mun E., Choi J.E., Kim K.H., Lee J.H., Kim H.S., Ha E. Exposure to air pollution and precocious puberty: a systematic review. Ewha Med J. 2024;47(2):e20. doi:10.12771/emj.2024.e20.

17. Huang J.V., Leung G.M., Schooling C.M. The association of air pollution with pubertal development: Evidence from Hong Kong's “Children of 1997” birth cohort. American Journal of Epidemiology. 2017;185(10):914-923. doi:10.1093/aje/kww200.

DETERMINATION OF MOLYBDENUM(VI) AND VANADIUM(IV) IONS IN ENVIRONMENTAL SAMPLES USING SORPTION AND SPECTROPHOTOMETRIC METHODS

M.E. Djuraeva, Z.A. Smanova, M.A. Ataxodjaeva

Tashkent State Medical University, Department of Medical and Biological Chemistry № 2, Senior Lecturer.

djuraevamatluba1991@gmail.com

Abstract. *In this study, spectrophotometric methods for the determination of molybdenum(VI) and vanadium(IV) ions were developed. Alizarin Red S was used as the analytical reagent for molybdenum(VI), while Xylenol Orange was employed for vanadium(IV). The UV–Vis absorption spectra of the formed complexes were investigated, and the optimum analytical conditions were established. The developed methods were validated using wastewater samples and demonstrated high accuracy, sensitivity, and reproducibility. The proposed methods are suitable for the determination of heavy metal ions in environmental monitoring and analytical laboratories.*

Keywords: *molybdenum(VI), vanadium(IV), spectrophotometry, Alizarin Red S, Xylenol Orange, UV–Vis, heavy metal ions, wastewater, environmental monitoring.*

INTRODUCTION

The rapid development of industrial production, mining, metallurgy, and the increasing use of mineral fertilizers and various chemicals in agriculture have significantly contributed to the accumulation of heavy metal ions in environmental media [1]. In particular, molybdenum(VI) and vanadium(IV) ions can accumulate in soils and aquatic systems, causing ecological imbalance and posing potential risks to human health [2,3]. Although molybdenum is an essential trace element, its excessive concentration can disrupt aquatic ecosystems and exhibit toxic effects [4]. Vanadium, a major component of many industrial wastes, is also hazardous to living organisms at elevated concentrations [5]. Therefore, the rapid, sensitive, and selective determination

of these ions at low concentrations is an important task in environmental monitoring [6].

Although modern instrumental techniques, such as ICP-MS, ICP-OES, and AAS, provide high analytical accuracy, their high cost and the requirement for sophisticated laboratory equipment limit their routine application [7]. Consequently, the development of simple, cost-effective, and highly sensitive spectrophotometric and sorption-spectrophotometric methods remains an important research direction [8,9]. For the determination of molybdenum(VI), Alizarin Red S (ARS) was immobilized on the surface of a PPD-1 fibrous sorbent [10]. The absorption spectra of the resulting metal complex were recorded using a UV–Vis spectrophotometer, and the effects of pH, reagent concentration, and sorption conditions on complex formation were investigated [11]. For the determination of vanadium(IV), a UV–Vis spectrophotometric method based on Xylenol Orange was employed. The absorption spectra of the vanadium(IV)–Xylenol Orange complex were measured using an EMC-30PC-UV-1800 spectrophotometer [12]. The reaction medium, pH, reagent concentration, reaction time, and complex stability were optimized to achieve the best analytical performance [13].

Materials and Methods. In this study, spectrophotometric methods were developed for the determination of molybdenum(VI) and vanadium(IV) ions. Alizarin Red S (ARS) was selected as the analytical reagent for molybdenum(VI), while Xylenol Orange was used for the determination of vanadium(IV). The absorption spectra of both systems were recorded against a blank solution using an EMC-30PC-UV-1800 UV–Vis spectrophotometer**.** The spectral analysis showed that the maximum absorption wavelength of Alizarin Red S was λmax= 428 nm**,** whereas the molybdenum(VI)–Alizarin Red S complex exhibited a maximum absorption at λmax = 530 nm. A bathochromic shift of $\Delta\lambda$ = 102 nm was observed, confirming the formation of a stable colored complex between molybdenum(VI) ions and Alizarin Red S, as well as the high analytical contrast of the reaction.

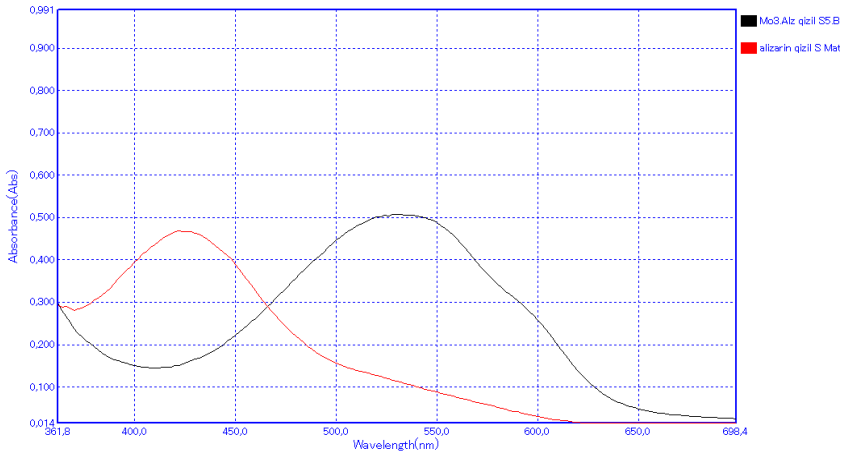


Figure 1. *Absorption spectra of Alizarin Red S immobilized on the surface of a PPD-1 fibrous sorbent and its complex with molybdenum(VI): (1) ARS (λmax= 428 nm); (2) Mo(VI)–ARS complex (λmax = 530 nm).*

Similarly, the maximum absorption wavelength of Xylenol Orange was found to be λmax=432 nm, while the vanadium(IV)–Xylenol Orange complex exhibited a maximum absorption at λmax=578 nm. A bathochromic shift of Δλ = 146 nm was observed, confirming the formation of a stable colored complex between vanadium(IV) ions and Xylenol Orange and indicating the generation of a strong analytical signal suitable for spectrophotometric determination.

The obtained results demonstrate that Alizarin Red S and Xylenol Orange are highly sensitive and selective analytical reagents for the determination of molybdenum(VI) and vanadium(IV) ions, respectively.

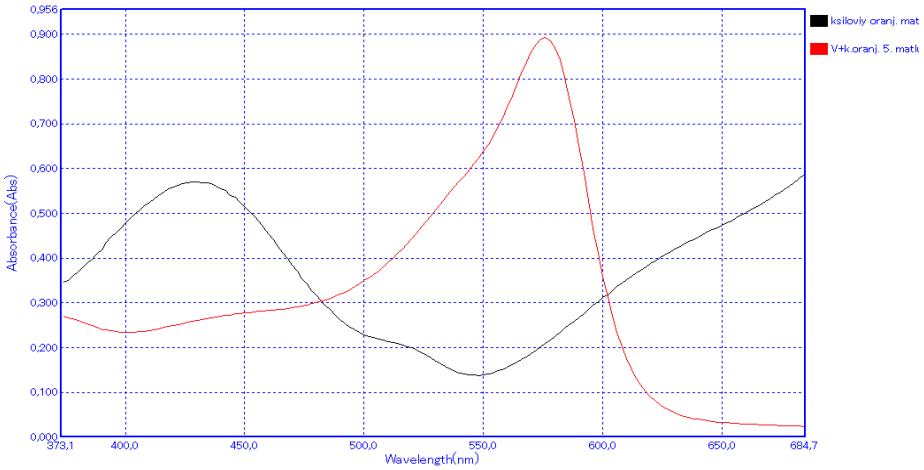


Figure 2. *UV–Vis absorption spectra of Xylenol Orange and its complex with vanadium(IV): (1) Xylenol Orange (λmax=432 nm);* ***(2)*** *V(IV)–Xylenol Orange complex (λmax = 578 nm).*

Results and Discussion. To evaluate the practical applicability of the developed spectrophotometric methods, experiments were carried out using wastewater samples collected from the Shurtan Oil and Gas Production Department in the Kashkadarya region**.** The concentrations of molybdenum(VI) and vanadium(IV) ions were determined using the spike-and-recovery method. This approach was employed to assess the accuracy, precision, reproducibility, and applicability of the proposed methods for the analysis of real environmental samples.

Me^{n+}	Entered, mg/l	Found, mg/l	S	Sr
Mo^{6+}	1,00	1,24±0,02	0,015	0,012
	1,50	1,86±0,06	0,051	0,027
	2,00	2,47±0,03	0,026	0,011
VO^{2+}	1,00	1,0±0,04	0,076	0,052
	1,50	1,54±0,06	0,055	0,038
	2,00	2,05±0,09	0,083	0,04

Results and Discussion. The results obtained for the determination of molybdenum(VI) showed good agreement between the added and measured concentrations within the range of 1.00–2.00 mg/L. The standard deviation (**S**) ranged from 0.015 to 0.051, while the relative standard deviation **(**Sr**)** was 0.011–0.027**.** These findings confirm the high accuracy, precision, and reproducibility of the developed sorption-spectrophotometric method and demonstrate its suitability for the reliable determination of molybdenum(VI) ions in environmental water samples.

The developed method for the determination of vanadium(IV) also exhibited excellent analytical performance. Within the concentration range of

1.00–2.00 mg/L, the measured values were in close agreement with the added concentrations. The standard deviation (S) ranged from 0.055 to 0.083, and the relative standard deviation (Sr) did not exceed 0.052. These results indicate that the method is reliable, reproducible, and suitable for determining vanadium(IV) ions in wastewater and other natural water samples.

Overall, the results demonstrate that the proposed spectrophotometric methods provide sensitive, selective, and reliable determination of molybdenum(VI) and vanadium(IV) ions in real environmental water samples. The low values of S and Sr confirm the high analytical performance and good recovery of the developed methods, making them promising tools for environmental monitoring, wastewater quality control, and routine analytical laboratory applications.

CONCLUSION

Sensitive, selective, and reliable spectrophotometric methods for the determination of molybdenum(VI) and vanadium(IV) ions were successfully developed. The complex formation of Alizarin Red S with molybdenum(VI) and Xylenol Orange with vanadium(IV) was investigated, and the optimum analytical conditions were established. The proposed methods were successfully applied to real wastewater samples, demonstrating high accuracy, precision, and reproducibility. Owing to their simplicity, rapid analysis, high sensitivity, and cost-effectiveness, these methods are suitable for the determination of molybdenum(VI) and vanadium(IV) ions in environmental and industrial water samples, as well as for routine environmental monitoring and analytical laboratory practice.

REFERENCES

1. Oguma, K., Yoshioka, O., Noro, J., & Sakurai, H. (2012). Simultaneous determination of vanadium(IV) and vanadium(V) by flow injection analysis using kinetic spectrophotometry with Xylenol Orange. *Talanta*, 96, 44–49. https://doi.org/10.1016/j.talanta.2012.01.062 (ScienceDirect)

2. Kumar, K., & Rao, T. P. (2018). Spectrophotometric methods for determination of vanadium: A review. *Toxicological and Environmental Chemistry*, 100(2), 1–15. (ResearchGate)

3. Gavazov, K. B., et al. (2024). Mono- and binuclear complexes in spectrophotometric analysis. *Molecules*, 29(18), 4511. https://doi.org/10.3390/molecules29184511 (MDPI)

4. Otomo, M. (2020). Spectrophotometric determination of vanadium(IV) with Xylenol Orange. *Analytical Sciences*, 36(5), 1–6. (semanticscholar.org)

5. Budevsky, O. (2025). Colorimetric determination of vanadium with Xylenol Orange. *Talanta*. https://doi.org/10.1016/0039-9140(64)80187-9 (academia.edu)

6. Djurayeva, M. E., Smanova, Z. A., Atakhodjayeva, M. A., & Yakubkhodjaeva, M. R. (2025). Development of new methods for the determination of molybdenum ions in water and seasonal quantitative analysis of these ions. *Universum Chemistry & Biology*, *135*(9). https://doi.org/10.32743/unichem.2025.135.9.20668 Li,

7. X., Zhuang, D., Liu, X., Luo, H., Zhang, K., Jiang, B., Chen, W., & Xie, W. (2026). Rapid determination of molybdenum(VI) in water using phenylfluorone-modified test strips combined with colorimetry and LAB color space analysis. *Sensors, 26*(3), 885. https://doi.org/10.3390/s26030885. (MDPI)

8. Alrasheedi, M., Alanazi, A. H., Al Zbedy, A. S., et al. (2025). Polymer inclusion membranes-based sensor for the determination of molybdenum in food, water, and biological samples. *Monatshefte für Chemie - Chemical Monthly, 156*, 1283–1298. https://doi.org/10.1007/s00706-025-03384-8. (Springer)

9. Dhole, R. S., Patil, N. B., Nangare, S. N., et al. (2026). Analytical prospects of molybdenum oxide quantum dots: Emerging fluorescent platforms for food safety assessment. *Microchemical Journal*. https://doi.org/10.1016/j.microc.2026.117805. (ResearchGate)

10. Li, M., Qiu, L., Su, L., Zhou, C., Yao, L., Ai, X., Huang, C., et al. (2026). Ecological risks of molybdenum in black shale and carbonate areas: Exposure, health effects, and relation with selenium. *Environmental Pollution, 391*, 127576. https://doi.org/10.1016/j.envpol.2025.127576. (ResearchGate)

11. Ugulu, I., Khan, Z. I., Aslam, M., et al. (2026). Molybdenum accumulation in wastewater-irrigated rice and human exposure risks. *Journal of Environmental Science and Health, Part A, 61*(1), 1–15. https://doi.org/10.1080/10934529.2026.2628462. (ResearchGate)

12. Rana, M., Sankhyan, N. K., Thakur, P., Babal, B., Anjali, Sharma, S., Kumari, S., & Kumar, P. (2025). Molybdenum in soil-plant system: Bioavailability, dynamics and implications for sustainable crop production. *Discover Soil, 2*(1), 89. https://doi.org/10.1007/s44378-025-00118-4. (ResearchGate)

13. Dumas, A., De Windt, L., Serclerat, I., Sanchez, F., Huet, B., Kosson, D. S., & Tapsoba, N. (2025). Molybdenum-contaminated soil stabilization/solidification by mixtures of magnesium oxide and limestone calcined clay cement. *Journal of Hazardous Materials, 492*, 138056. https://doi.org/10.1016/j.jhazmat.2025.138056. (ResearchGate)

ПОЛИСАХАРИДНЫЕ КОМПЛЕКСЫ *PHLOMOIDES CANESCENS* КАК ПЕРСПЕКТИВНЫЙ ИСТОЧНИК ПРЕБИОТИЧЕСКИХ КОМПОНЕНТОВ

Рахимова Хилолахон Рустамжоновна

д-р филос. по хим. наукам,

доц. кафедры медицинской химии и биологических наук,

Центральноазиатский медицинский университет,

Узбекистан, г. Фергана

E-mail: hilolaxon.rahimzoda.87@bk.ru

Аннотация. *В работе рассмотрен химический профиль Phlomoides canescens и проведена оценка функциональных свойств углеводных фракций, выделенных из надземной части растения. Основное внимание уделено водорастворимым полисахаридам, пектиновым соединениям и гемицеллюлозным компонентам. Дополнительно обобщены сведения об эфирномасличном и флавоноидном составе растения. В условиях in vitro изучено влияние полученных фракций на условно-патогенные и пробиотические микроорганизмы. Установлено, что исследованные образцы практически не обладали выраженным ингибирующим действием на тест-культуры, тогда как их присутствие в питательной среде способствовало сохранению или увеличению жизнеспособности ряда пробиотических штаммов. Наиболее существенная стимуляция выявлена у Bifidobacterium bifidum при использовании пектиновой фракции. Полученные результаты позволяют рассматривать полисахаридный комплекс P. canescens в качестве перспективного растительного сырья для получения пребиотических ингредиентов.*

Ключевые слова: *Phlomoides canescens, Lamiaceae, полисахариды, пектин, гемицеллюлоза, пребиотики, пробиотики, Bifidobacterium bifidum, микробиота.*

ВВЕДЕНИЕ

Современные исследования природных биологически активных веществ все чаще ориентированы не только на поиск соединений с прямым антимикробным действием, но и на выявление веществ, способных поддерживать физиологически полноценную микробиоту. В этом

отношении растительные полисахариды представляют значительный научный и практический интерес. Их структурное разнообразие определяет возможность использования в качестве субстратов для отдельных групп микроорганизмов кишечной экосистемы.

Семейство *Lamiaceae* объединяет значительное количество лекарственно и хозяйственно ценных растений. Для представителей данного семейства характерно присутствие эфирных масел, флавоноидов, фенольных соединений, иридоидов и углеводных полимеров. Род *Phlomoides* Moench занимает заметное место среди представителей семейства и широко представлен в Евразии [3–6].

Phlomoides canescens представляет интерес как источник комплекса природных соединений. Ранее в различных органах растения были изучены углеводы, эфирномасличные компоненты и другие группы биологически активных веществ. Из надземной части растения выделены спирторастворимые сахара, водорастворимые полисахариды, пектиновые вещества и гемицеллюлозы [1, 2].

Химическое исследование эфирного масла также показало сложный состав летучих соединений. В отдельных образцах листьев и цветков методом газовой хромато-масс-спектрометрии выявлено 54 компонента, а в одной из серий анализа 29 соединений составляли 97,81 % общей суммы идентифицированных веществ [1,3].Среди основных компонентов отмечались транс-β-оцимен, 5-метилбензофуразан, транс-β-фарнезен, 6,10,14-триметилпентадекан-2-он, метил-8,11,14-гептадекатриеноат и тритетраконтан.

Однако наличие эфирного масла и флавоноидов не исчерпывает функциональный потенциал растения. Особое значение могут иметь полисахариды, поскольку они способны выступать источниками углерода для отдельных полезных микроорганизмов. Поэтому исследование их влияния на пробиотические культуры представляет самостоятельный интерес.

ЦЕЛЬ ИССЛЕДОВАНИЯ

Целью исследования являлось изучение биологической направленности полисахаридных фракций *P. canescens* с акцентом на сравнительную оценку их антимикробного и пребиотического действия.

МАТЕРИАЛЫ И МЕТОДЫ

Объектом исследования служили полисахаридные компоненты, полученные из надземной части *P. canescens*. В работе использовали три образца, обозначенные как ВГПС-х 1 %, ПВ 6,2 и ВРПСГ-1,22.

Для оценки антимикробных свойств исследовали культуры *Escherichia coli* 002673/477, *Pseudomonas aeruginosa* 003841/114, *Staphylococcus aureus*, *Bacillus subtilis* VKM и *Candida albicans*. В качестве эталонного антибактериального препарата применяли цефазолин.

Пробиотический потенциал определяли с использованием *Lacticaseibacillus rhamnosus*, *Streptococcus salivarius*, *Lactiplantibacillus plantarum* и *Bifidobacterium bifidum*.

Для бактериальных тест-культур использовали мясо-пептонный агар, для *C. albicans* — агар Сабуро. Бактерии культивировали при температуре около 35–36 °C в течение 18–24 часов, грибковую культуру — около 30 °C в течение 44–52 часов.

Пробиотические культуры активировали на среде МРС, а *B. bifidum* выращивали на среде Блаурок. Перед проведением эксперимента культуры активировали дважды.

Для определения антимикробной активности применяли метод диффузии в агар с использованием стерильных лунок диаметром 6 мм. Исследуемые полисахаридные растворы использовали в концентрации 100 мг/мл. После внесения образцов чашки инкубировали в соответствии с условиями культивирования соответствующих микроорганизмов. Результат оценивали по диаметру зоны задержки роста [10].

Пребиотические свойства определяли в модельной системе *in vitro*. Исследуемые фракции в концентрации 0,5 % вносили в среду МРС без

углеводов. Контроль составляла стандартная среда с глюкозой. Жизнеспособность культур оценивали по количеству колониеобразующих единиц — КОЕ/мл [2, 11].

РЕЗУЛЬТАТЫ ИССЛЕДОВАНИЯ

Полученные результаты показали различную направленность биологического действия исследуемых фракций. В отношении большинства условно-патогенных микроорганизмов выраженного подавления роста не наблюдалось.

Таблица 1.

Антимикробное действие полисахаридных фракций *P. canescens.*

№	Исследуемый образец	*E. coli*	*P. aeruginosa*	*S. aureus*	*B. subtilis*	*C. albicans*
1	ВГПС-х 1 %	0	0	0	0	0
2	ПВ 6,2	0	10	0	0	0
3	ВРПСГ-1,22	0	0	0	0	8
4	Цефазолин	20	8	20	16	14

Примечание: значения представлены как диаметр зоны задержки роста, мм.

Таким образом, ВГПС-х 1 % не формировал зон подавления роста исследованных культур. У образца ПВ 6,2 была зарегистрирована зона 10 мм в отношении *P. aeruginosa*, а ВРПСГ-1,22 формировал зону 8 мм в отношении *C. albicans*. Однако полученные значения не сопоставимы с более выраженным действием контрольного препарата и не позволяют характеризовать исследованные полисахариды как сильные антимикробные агенты.

Иная картина наблюдалась при изучении взаимодействия фракций с пробиотическими культурами.

Таблица 2.

Влияние полисахаридных фракций на жизнеспособность пробиотических микроорганизмов

№	Пробиотический штамм	Контроль, КОЕ/мл	ВГПС-х 1, КОЕ/мл	ПВ 6,2, КОЕ/мл	ВРПСГ-1,22, КОЕ/мл
1	*L. rhamnosus*	4×10^9	3×10^9	5×10^9	4×10^9
2	*S. salivarius*	4×10^9	5×10^9	2×10^9	3×10^9
3	*L. plantarum*	4×10^9	4×10^9	5×10^9	4×10^9
4	*B. bifidum*	2×10^3	2×10^4	4×10^7	4×10^6

Наиболее существенное изменение наблюдалось у *B. bifidum*. В контрольной среде количество жизнеспособных клеток составляло 2×10^3 КОЕ/мл. После добавления ВГПС-х 1 показатель увеличивался до 2×10^4 КОЕ/мл. Для ВРПСГ-1,22 значение достигало 4×10^6 КОЕ/мл, тогда как при использовании ПВ 6,2 оно составляло 4×10^7 КОЕ/мл.

У лактобактерий существенного снижения жизнеспособности под действием исследуемых фракций не обнаружено. Для *L. rhamnosus* наиболее высокий показатель получен при добавлении ПВ 6,2 — 5×10^9 КОЕ/мл. Для *L. plantarum* аналогичная фракция также обеспечивала показатель 5×10^9 КОЕ/мл.

ОБСУЖДЕНИЕ

Полученные результаты свидетельствуют о том, что биологическая перспективность исследованных полисахаридов может быть связана прежде всего с их пребиотическим, а не антимикробным потенциалом.

Отсутствие выраженного подавления условно-патогенных микроорганизмов само по себе не является отрицательным результатом при поиске пребиотических ингредиентов. Основная функция пребиотического субстрата заключается в поддержании определенных групп полезных микроорганизмов, а не в неспецифическом уничтожении микрофлоры.

Особого внимания заслуживает результат, полученный для *B. bifidum*. Пектиновая фракция ПВ 6,2 увеличила показатель жизнеспособности с 2×10^3 до 4×10^7 КОЕ/мл. Вероятно, это может быть связано с химической структурой пектиновых полимеров, особенностями их разветвления и

доступностью отдельных углеводных фрагментов для ферментативного метаболизма бактерий.

Положительная динамика также отмечена для *L. rhamnosus* и *L. plantarum*. При этом показатели жизнеспособности оставались на уровне порядка 10^9 КОЕ/мл. Это позволяет предположить, что исследованные полисахариды совместимы с рядом пробиотических микроорганизмов.

Возможный функциональный эффект *P. canescens* следует рассматривать с учетом комплексного химического состава растения. Эфирные масла и флавоноидные соединения характеризуют растение как богатый источник вторичных метаболитов, тогда как полисахаридные компоненты могут определять его пищевую и пребиотическую перспективность [1, 7–9].

Вместе с тем результаты настоящей работы следует рассматривать как этап предварительного *in vitro* скрининга. Для подтверждения пребиотических свойств необходимы дальнейшие исследования, включая определение моносахаридного состава, молекулярно-массовых характеристик и структурных особенностей полисахаридов.

Необходима также оценка устойчивости полимеров к воздействию пищеварительных ферментов, исследование продуктов их ферментации и проведение моделей, максимально приближенных к условиям кишечного микробиоценоза.

ПРАКТИЧЕСКАЯ ЗНАЧИМОСТЬ

Полисахаридные компоненты *P. canescens* могут представлять интерес для получения природных ингредиентов функционального назначения. Наиболее перспективным направлением является создание продуктов, содержащих сочетание пребиотического субстрата и пробиотических микроорганизмов.

В дальнейшем возможно исследование пектиновой фракции ПВ 6,2 в качестве компонента синбиотических композиций. Однако переход к практическому применению требует стандартизации растительного сырья,

контроля химического состава, установления показателей безопасности и оценки стабильности получаемых препаратов или пищевых форм.

ЗАКЛЮЧЕНИЕ

Проведенное исследование позволяет сформулировать следующие положения:

1. *Phlomoides canescens* характеризуется комплексным химическим составом, включающим полисахариды, пектиновые вещества, гемицеллюлозы, эфирные масла и флавоноидные соединения.

2. Исследованные полисахаридные фракции не проявляли выраженного антимикробного действия в отношении большинства использованных тест-культур.

3. Наиболее существенная биологическая активность выявлена при взаимодействии полисахаридов с пробиотическими микроорганизмами.

4. Пектиновая фракция ПВ 6,2 оказала наиболее заметное влияние на *Bifidobacterium bifidum*, увеличив показатель жизнеспособности до 4×10^7 КОЕ/мл.

5. Полученные результаты позволяют рассматривать углеводные компоненты *P. canescens* как перспективный объект дальнейшего изучения в направлении разработки пребиотических и синбиотических продуктов.

СПИСОК ЛИТЕРАТУРЫ

1. Рахимова Х. Р. Исследование летучих компонентов растения *Phlomoides canescens* // ActaCAMU. 2023. Т. 4, № 4. С. 108–114. DOI: 10.5281/zenodo.10429832.

2. Рахимова Х. Р. Комплекс углеводов *Phlomoides canescens*, распространенного в Ферганской долине // Asian Journal of Multidimensional Research. 2021. Vol. 10, No. 10. P. 1154–1159.

3. Рахимова Х. Р., Ибрагимов А. А. Исследование летучих веществ растения *Phlomoides canescens* // Научные новости ФарДУ. 2022. № 3. С. 289–293.

4. *Phlomis* // The Plant List. Version 1.1. 2013.

5. Адылов Т. А., Махмедов А. М. Род *Phlomoides* Moench — Фломоидес // Определитель растений Средней Азии. Ташкент: Фан, 1987. Т. 9. С. 104–105.

6. Иллюстрированный определитель растений Средней России. М.: Товарищество научных изданий КМК, 2004. Т. 3.

7. Olennikov D. N., Dudareva L. V., Tankhaeva L. M. Chemical composition of essential oils from *Galeopsis bifida* and *Phlomoides tuberosa* // Chemistry of Natural Compounds. 2010. Vol. 46, No. 2. P. 316–318.

8. Glyzin V. I., Peshkova V. A., Khokhrina T. A. Luteolin 7-β-D-glucosiduronic acid from *Phlomis tuberosa* // Chemistry of Natural Compounds. 1972. Vol. 8, No. 6. P. 785.

9. Vavilova N. K., Gella E. V. Flavonoids from *Phlomis tuberosa* // Chemistry of Natural Compounds. 1973. Vol. 9, No. 2. P. 147–149.

10. ОФС.1.2.4.0010.15. Определение антимикробной активности антибиотиков методом диффузии в агар. Методические указания.

11. Лысак В. В. Микробиология: учебное пособие. Минск: БГУ, 2007.

VITAMIN COMPOSITION OF FRUITS CALLED *RUBUS CAESIUS L.* GROWING IN THE FERGANA REGION

Shakhzodakhon M. Mukhtorova

Doctor of Philosophy (PhD) in Chemical Sciences,

Kokand State University

Ibrakhimjon R. Askarov

Professor at Andijan State University,

Doctor of Chemical Sciences

Vakhobjon U. Khujayev

Professor at Kokand State University,

Doctor of Chemical Sciences

Annotation. *This study focuses on the investigation of the vitamin composition of* Rubus caesius *L. (dewberry) fruits growing in the Fergana Region at different stages of ripening. The qualitative and quantitative profiles of water-soluble vitamins in unripe and fully ripe fruits were analyzed using high-performance liquid chromatography (HPLC). The results obtained made it possible to identify quantitative changes in vitamin components during fruit maturation, characterize their compositional features, and assess the potential significance of* Rubus caesius *L. fruits as a source of biologically active compounds.*

Keywords*: Rubus caesius L. (dewberry), high-performance liquid chromatography, water-soluble vitamins, B-group vitamins.*

INTRODUCTION

In recent years, the application of medicinal plants and plant-derived preparations in clinical practice has attracted increasing attention. This growing interest is largely associated with concerns regarding the prolonged and unsupervised use of certain chemically synthesized pharmaceutical agents, which may contribute to the development of adverse effects and functional disturbances in both humans and animals. In this context, medicinal plants containing a wide range of naturally occurring bioactive compounds are increasingly recognized as valuable sources of raw materials for the pharmaceutical and healthcare industries.

At the global level, demand for herbal medicinal products, as well as for medicinal plant materials and plant-based pharmaceutical products, has continued to expand, highlighting the growing importance of medicinal plants in contemporary medicine and pharmaceutical research [1].

MAIN PART

The fruits of plants belonging to the genus *Rubus* can be consumed both fresh and dried and can also be processed for use in the food and canning industries. In this regard, investigating the accumulation of biologically active compounds, particularly vitamins, in different organs of these plants can contribute to a more comprehensive assessment of their practical applications and pharmaceutical potential [2].

The fruits of *Rubus caesius L.* represent a valuable natural source of biologically active substances. Their chemical composition includes a diverse range of compounds, such as vitamins, organic acids, natural pigments, phenolic compounds, pectic substances, and essential mineral elements [3].

For this study, unripe and ripe fruits of *Rubus caesius* L. (dewberry) collected from the territory of Uzbekistan District, Fergana Region were selected as biological materials. The component composition and quantitative characteristics of water-soluble vitamins accumulated in the generative organs of the collected samples were comprehensively investigated. The identification and quantification of the vitamins were carried out using high-performance liquid chromatography (HPLC) under gradient elution conditions. A diode array detector (DAD) was employed for chromatographic separation and detection, enabling the qualitative and quantitative characteristics of the identified vitamin components to be evaluated [4].

Table 1 presents the composition and quantitative characteristics of water-soluble vitamins identified in the ripe and unripe fruits of *Rubus caesius* L. collected as study samples from the territory of Uzbekistan District, Fergana Region.

Table 1

Quantitative composition of water-soluble vitamins in unripe and ripe fruits of *Rubus caesius* L. (mg/100 g)

№	Water-soluble vitamins	Unripe	Ripe
1.	B_1 - thiamine	0	0
2.	B_2 - riboflavin	3,457	12,254
3.	B_6 - pyridoxine	12,785	10,321
4.	B_9 - folic acid	5,547	42,854
5.	C - ascorbic acid	1,954	1,325
6.	PP - nicotinic acid	0	0

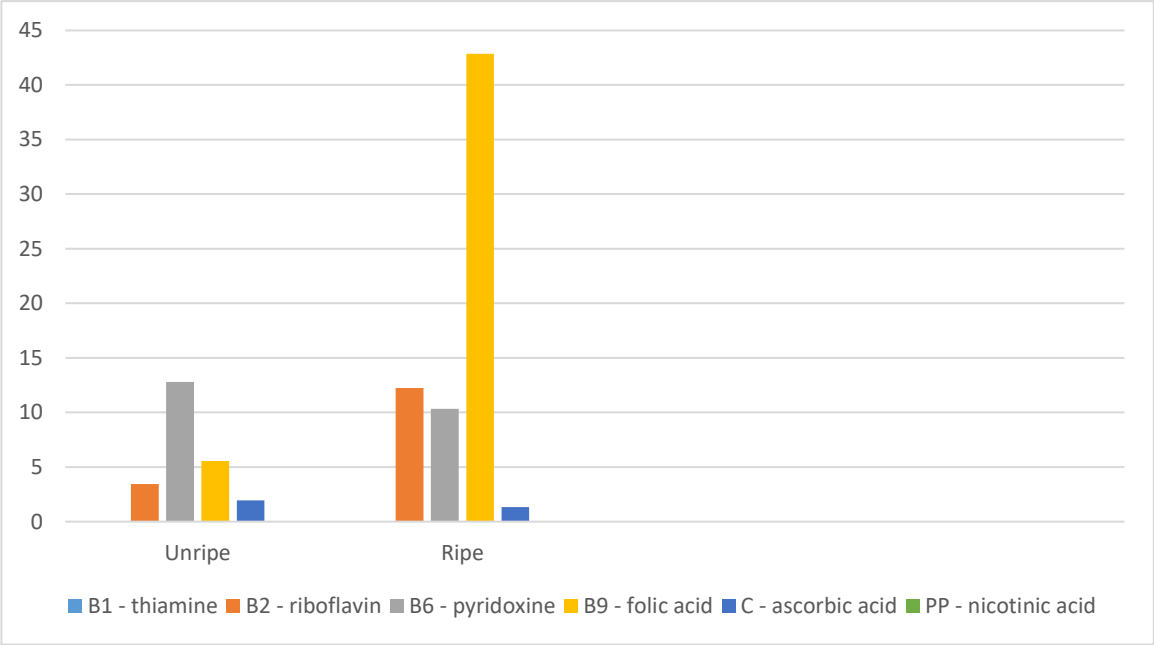
According to the results presented in Table 1, considerable differences were observed in the concentrations of water-soluble vitamins between the unripe and ripe stages of *Rubus caesius* L. fruits. Among the vitamins detected in the unripe fruits, vitamin B_6 (pyridoxine) showed the highest concentration, reaching 12.785 mg/100 g. This was followed by vitamin B_9 (folic acid) at 5.547 mg/100 g, vitamin B_2 (riboflavin) at 3.457 mg/100 g, and vitamin C (ascorbic acid) at 1.954 mg/100 g. Vitamins B_1 (thiamine) and PP (nicotinic acid) were not detected in the unripe fruits.

A quantitative shift in the vitamin profile was observed in the ripe fruits. At this stage, vitamin B_9 (folic acid) was present at the highest concentration, reaching 42.854 mg/100 g. Vitamin B_2 followed with a concentration of 12.254 mg/100 g, while vitamin B_6 was detected at 10.321 mg/100 g. In contrast, vitamin C was present at 1.325 mg/100 g, representing the lowest concentration among the vitamins detected in the ripe fruits. Vitamins B_1 and PP were not detected at either stage of fruit development.

A comparison of the unripe and ripe fruits revealed distinct changes in the concentrations of individual vitamins during fruit maturation. The concentration of vitamin B_2 increased from 3.457 mg/100 g in the unripe fruits to 12.254 mg/100 g in the ripe fruits. A considerably more pronounced increase was observed for vitamin B_9, whose concentration rose from 5.547 mg/100 g to 42.854 mg/100 g. In contrast, the concentration of vitamin B_6 decreased from 12.785 mg/100 g in the unripe fruits to 10.321 mg/100 g at the ripe stage. Vitamin C also showed a

declining trend, decreasing from 1.954 mg/100 g in the unripe fruits to 1.325 mg/100 g during maturation (Figure 1).

Figure 1. Diagram of water-soluble vitamin content in unripe and ripe fruits of *Rubus caesius* L. (mg/100 g)



CONCLUSION

In conclusion, the component composition and quantitative characteristics of water-soluble vitamins in the unripe and ripe fruits of Rubus caesius L. (European dewberry) collected from Uzbekistan District, Fergana Region, were comprehensively investigated and comparatively evaluated using high-performance liquid chromatography (HPLC) with a diode array detector (DAD). The results demonstrated that the accumulation patterns of vitamins changed considerably throughout the fruit-ripening process. Overall, the findings indicate that the accumulation of water-soluble vitamins in *Rubus caesius* L. fruits is closely associated with the physiological stage of fruit development and maturation.

REFERENCES

1. Z. Sanoyev, P. Turdiyev, N. Alimova, B. Berdimurodova. Farmokognoziya. Toshkent-2023, 5-b.

2. Asqarov I.R.Tabobat qomusi. Toshkent. 2019. 373-374 b.

3. https://ethnobotany.uz/plant/rubus-caesius-l-2/

4. Мухторова Ш. М., Мукимжонова У. В., Аскаров И. Р., Хужаев В. У. // Анализ витаминов в растении Lonicera nummularifolia, собранном в Байсунских горах. Universum: химия и биология: научный журнал. – № 6 (132). Часть 2., М., Изд. «МЦНО», 2025. – 35 с.

O‘ZBEKISTONDA EKOLOGIYA HUQUQI RIVOJLANISHI VA HOZIRGI HOLATI

Mamatov Jamshid Asror o‘g‘li
mamatovjami2@gmail.com

Annotatsiya: *Ushbu tezisda O‘zbekistondagi ekologik-huquqiy munosabatlar va ularning mustahkamlanishi, hozirgi kunda shakllangan munosabatlar hamda O‘zbekiston huquq tizimining bu boradagi ishlari haqida ma’lumot beriladi. Shuningdek, so‘nggi vaqtlarda O‘zbekiston duch kelayotgan muammolar va ularning yechimi, jumladan bir necha ekologiya inspektorlarining xizmat vaqtida halok bo‘lish holatlari va bundan kelib chiqqan huquqiy oqibatlar haqida bevosita ma’lumot beriladi.*

Аннотация: *В данном тезисе представлена информация об эколого-правовых отношениях в Узбекистане, их укреплении и о том, какая работа проводится правовой системой страны в этом направлении. Также приводится информация о проблемах, с которыми в последнее время сталкивается Узбекистан, и путях их решения, в том числе о случаях гибели нескольких экологических инспекторов при исполнении служебных обязанностей и о вытекающих из этого правовых последствиях.*

Abstract: *This thesis provides information on ecological-legal relations in Uzbekistan, their strengthening, and the work being carried out by the country’s legal system in this area. It also provides information on the problems Uzbekistan has faced recently and their solutions, including cases of several ecology inspectors dying while on duty and the resulting legal consequences.*

Kalit so‘zlar: *ekologiya huquqi; atrof-muhit muhofazasi; tabiiy resurslar; barqaror rivojlanish; suv resurslari; iqlim o‘zgarishi; ekologik xavfsizlik; qonunchilik.*

Ключевые Слова: *экологическое право; охрана окружающей среды; природные ресурсы; устойчивое развитие; водные ресурсы; изменение климата; экологическая безопасность; законодательство.*

Key words: *environmental law; environmental protection; natural resources; sustainable development; water resources; climate change; ecological safety; legislation.*

KIRISH

Ekologik siyosat yangi O‘zbekistonning kun tartibida muhim o‘rin tutadi. Vazirlik faoliyatini takomillashtirish, ekologiya va atrof-muhitni muhofaza qilish sohasini transformatsiya qilish chora-tadbirlari, iqlim o‘zgarishi va uning oqibatlariga qarshi kurashish bo‘yicha harakatlar, daraxtlarning kesilishiga moratoriy, toza «yashil» energiyani joriy etish, qattiq maishiy chiqindilarni boshqarish, «yashil» transport infratuzilmasini rivojlantirish, muhofaza etiladigan tabiiy hududlar tarmog‘ini kengaytirish, ekotizimlarni tiklash va bioxilma-xillikni saqlash, cho‘llanish va qurg‘oqchilikka qarshi kurashish, ekologik qonunchilikni xalqaro standartlar asosida unifikatsiya qilish, sohaga zamonaviy axborot texnologiyalarini joriy etish chora-tadbirlari ijobiy tendentsiyalarni namoyon etmoqda.

ADABIYOTLAR TAHLILI VA METODOLOGIYA

Davlatimiz rahbari Shavkat Mirziyoyev tomonidan ilgari surilgan «Yashil Makon» tashabbusi chinakam umummilliy loyihaga aylanib ulgurdi. Orol inqirozi oqibatlarini yumshatish, chang bo‘ronlariga qarshi kurashish, Orolbo‘yida ijtimoiy-ekologik vaziyatni barqarorlashtirish masalalariga alohida e’tibor qaratilmoqda. Davlatimiz rahbari tomonidan Orolbo‘yi mintaqasini ekologik innovatsiyalar va texnologiyalar hududi deb e’lon qilish haqidagi tashabbusi bo‘yicha BMT Bosh Assambleyasining maxsus rezolyutsiyasi qabul qilindi. Bu, Orolbo‘yi mintaqasida qulay muhitni ta’minlash, institutsional asoslarni rivojlantirish va «yashil» transformatsion o‘zgarishlarni rivojlantirish uchun zamin bo‘ldi. Bundan tashqari, yuzaga kelayotgan ekologik muammolarning transchegaraviy xususiyatini inobatga olgan holda, O‘zbekiston Respublikasi

Prezidenti tashabbusi bilan BMT Bosh Assambleyasining navbatdagi «Markaziy Osiyo global iqlim tahdidlari qarshisida: umumiy farovonlik yo‘lida hamjihatlik» rezolyutsiyasi qabul qilindi.

Hozirgi vaqtda fundamental va amaliy-ilmiy tadqiqotlarni samarali amalga oshirish, jumladan yangi bilimlarni egallashdan tortib, undan amaliy foydalanishgacha bo‘lgan tezkor usullarni topish har qachongidan ham muhim ahamiyatga ega. Shuningdek, ekologik, ijtimoiy-iqtisodiy va ilmiy-texnikaviy muammolarning zamonaviy yechimlarini taklif qilish zarur. Shularni inobatga olgan holda, O‘zbekiston Respublikasi Prezidentining farmoni bilan Markaziy Osiyo atrof-muhit va iqlim o‘zgarishini o‘rganish universiteti «Green University» tashkil etildi. Shu bilan birga, erishilgan yutuqlar bilan cheklanib qolmasdan, ichki resurslarni yanada samarali safarbar etish, yashil investitsiyalarni jalb etish, shuningdek, global hamkorlikni kengaytirish va mustahkamlash zarur. Kelajak avlodlar uchun ekologik xavfsizlikni ta’minlash, tabiiy resurslarni muhofaza qilishni takomillashtirishda har bir fuqaroning ishtiroki mamlakatimizning barqaror rivojlanishini ta’minlashning asosiy omilidir.

NATIJALAR

Tadqiqot natijalari shuni ko‘rsatadiki, hozirgi kunda O‘zbekistonda bir necha marta ekologiya inspektorlarining xizmat vaqtida halok bo‘lish holatlari yuz bergan. Bu holatlar tegishli huquqiy oqibatlarni keltirib chiqargan bo‘lib, ular ekologiya sohasidagi xodimlarning huquqiy va ijtimoiy himoyasi masalasini dolzarb tarzda ko‘tarib chiqmoqda.

MUHOKAMA

Yuqoridagi holatlar ekologiya inspektorlari faoliyatini huquqiy va institutsional jihatdan mustahkamlash zaruratini ko‘rsatadi. Shu sababli, kelajakda bunday hodisalarning oldini olish, inspektorlarning xizmat davomidagi xavfsizligini ta’minlash hamda ularning huquqiy maqomini yaxshilash bo‘yicha aniq rejalar va chora-tadbirlarni ishlab chiqish zarur.

XULOSA

2019-yilda O‘zbekiston Respublikasi qishloq xo‘jaligini rivojlantirishning 2020–2030-yillarga mo‘ljallangan strategiyasi tasdiqlandi. Unda aholining oziq-ovqat xavfsizligini ta’minlash, agrosanoat majmuasini rivojlantirish, tabiiy resurslardan oqilona foydalanish va atrof-muhit muhofazasini ta’minlash asosida boshqaruvning strategik ustuvor yo‘nalishlari qamrab olingan (O‘zbekiston Respublikasi Prezidentining Farmoni, 23.10.2019-yildagi PF–5853-son). Mamlakatda suv resurslaridan oqilona foydalanishni ta’minlash, ekinlarni yetishtirishda suvni tejaydigan texnologiyalarni keng joriy etish hamda ularni davlat tomonidan qo‘llab-quvvatlash, shuningdek, qishloq xo‘jaligida yer va suv resurslaridan samarali foydalanish konsepsiyasiga muvofiq sug‘oriladigan yerlarning meliorativ holatini yaxshilash bo‘yicha tizimli chora-tadbirlar amalga oshirilmoqda (O‘zbekiston Respublikasi Prezidentining Farmoni, 17.06.2019-yildagi PF–5742-son). Suvni tejaydigan texnologiyalar bilan qamrab olingan maydon sug‘oriladigan maydonlarning taxminan 25 foizini tashkil etadi.

2022–2026-yillarga mo‘ljallangan Yangi O‘zbekistonning taraqqiyot strategiyasida (O‘zbekiston Respublikasi Prezidentining Farmoni, 28.01.2022-yildagi PF–60-son) suv resurslarini boshqarish tizimini tubdan isloh qilish va suvni tejash, suv resurslaridan samarali foydalanish, suv xo‘jaligi obyektlarida elektr energiyasi iste’molini kamaytirish bo‘yicha davlat dasturini amalga oshirishga qaratilgan ustuvor vazifalar belgilangan (31-maqsad). O‘zbekiston Respublikasida suv resurslarini boshqarish va irrigatsiya sektorini rivojlantirishning 2021–2023-yillarga mo‘ljallangan strategiyasi (Prezidentning 24.02.2021-yildagi PQ–5005-son qarori) hamda 2022–2024-yillarda ijtimoiy va ishlab chiqarish infratuzilmasini rivojlantirish chora-tadbirlarida (Prezidentning 22.01.2022-yildagi PQ–98-son qarori) irrigatsiya va meliorativ loyihalarning samaradorligini tahlil qilishga ham e’tibor qaratilgan, jumladan bu obyektlarni suv va elektr energiyasi sarfini o‘lchash va nazorat qilishning avtomatlashtirilgan uskunalari bilan jihozlash bo‘yicha rasmiy takliflar qayd etilgan.

Xulosa qilib aytganda, O‘zbekiston Respublikasi suv xo‘jaligini rivojlantirishning 2020–2030-yillarga mo‘ljallangan konsepsiyasida

(Prezidentning 10.07.2020-yildagi PF–6024-son Farmoni) belgilangan vazifalarni izchil amalga oshirish va asosiy maqsadli ko‘rsatkichlarga erishishni ta’minlash maqsadida Yo‘l xaritasi qabul qilindi. Shuningdek, qishloq xo‘jaligida suvni tejaydigan texnologiyalarni joriy etishni yanada takomillashtirish chora-tadbirlari amalga oshirilmoqda (Prezidentning 01.03.2022-yildagi PQ–144-son qarori). Mazkur qarorda tomchilatib va yomg‘irlatib sug‘orish kabi suvni tejaydigan texnologiyalarni qo‘llash orqali suvdan foydalanish samaradorligini oshirish bo‘yicha ustuvor yo‘nalishlar va davlat tomonidan qo‘llab-quvvatlash tartibi belgilangan. So‘nggi yillarda energetika sohasiga resurs va energiya tejaydigan texnologiyalarni joriy etishga katta e’tibor qaratilmoqda, bu esa 2018–2022-yillarga mo‘ljallangan «Yo‘l xaritasi» (PQ–3981-son) hamda energiya samaradorligini oshirish bo‘yicha tezkor chora-tadbirlarga oid qarorda (Prezidentning 22.08.2019-yildagi PQ–4422-son qarori) o‘z aksini topgan.

ADABIYOTLAR RO‘YXATI

1. O‘zbekiston Respublikasi Prezidentining 2020-yil 10-noyabrdagi «Aholining sog‘lom ovqatlanishini ta’minlash bo‘yicha qo‘shimcha chora-tadbirlar to‘g‘risida»gi PQ–4887-sonli qarori. URL: https://lex.uz/docs/5090384

2. O‘zbekiston Respublikasi Prezidentining 2020-yil 11-noyabrdagi «2020–2023-yillarda Qoraqalpog‘iston Respublikasini kompleks ijtimoiy-iqtisodiy rivojlantirish chora-tadbirlari to‘g‘risida»gi PQ–4889-sonli qarori. URL: https://lex.uz/docs/5100705

3. O‘zbekiston Respublikasi Prezidentining 2020-yil 29-sentyabrdagi «Maishiy va qurilish chiqindilari bilan bog‘liq ishlarni boshqarish tizimini yanada takomillashtirish chora-tadbirlari to‘g‘risida»gi PQ–4846-sonli qarori. URL: https://lex.uz/docs/5023628

4. O‘zbekiston Respublikasi Prezidentining 2021-yil 24-fevraldagi «O‘zbekiston Respublikasida suv resurslarini boshqarish va irrigatsiya sektorini rivojlantirishning 2021–2023-yillarga mo‘ljallangan strategiyasini tasdiqlash to‘g‘risida»gi PQ–5005-sonli qarori. URL: https://lex.uz/docs/5307918

5. O‘zbekiston Respublikasi Prezidentining 2021-yil 29-iyuldagi «Birlashgan Millatlar Tashkiloti Bosh Assambleyasining 2021-yil 18-maydagi «Orolbo‘yi mintaqasini ekologik innovatsiyalar va texnologiyalar hududi deb e’lon qilish to‘g‘risida»gi maxsus rezolyutsiyasini amalga oshirish choralari to‘g‘risida»gi PQ–5202-sonli qarori. URL: https://lex.uz/docs/5538638

6. O‘zbekiston Respublikasi Prezidentining 2022-yil 22-yanvardagi «2022–2024-yillarda O‘zbekiston Respublikasining ijtimoiy va ishlab chiqarish infratuzilmasini rivojlantirish chora-tadbirlari to‘g‘risida»gi PQ–98-sonli qarori. URL: https://lex.uz/pdfs/5834443

7. O‘zbekiston Respublikasi Prezidentining 2022-yil 10-iyundagi «Yerlar degradatsiyasiga qarshi kurashishning samarali tizimini yaratish chora-tadbirlari to‘g‘risida»gi PQ–277-sonli qarori. URL: https://lex.uz/docs/6058690

8. O‘zbekiston Respublikasi Prezidentining 2022-yil 1-martdagi «Quyi bo‘g‘inda suv resurslarini boshqarishni takomillashtirish hamda suv iste’molchilari orasidagi munosabatlarni tartibga solish chora-tadbirlari to‘g‘risida»gi PQ–145-sonli qarori. URL: https://lex.uz/docs/5884123

9. O‘zbekiston Respublikasi Prezidentining 2022-yil 1-martdagi «Qishloq xo‘jaligida suvni tejaydigan texnologiyalarni joriy etishni yanada takomillashtirish chora-tadbirlari to‘g‘risida»gi PQ–144-sonli qarori. URL: https://lex.uz/ru/docs/5884584

10. O‘zbekiston Respublikasi Prezidentining 2023-yil 1-apreldagi «Suv resurslaridan foydalanish samaradorligini oshirish bo‘yicha kechiktirib bo‘lmaydigan chora-tadbirlar to‘g‘risida»gi PQ–107-sonli qarori. URL: https://lex.uz/docs/6420836

2-SECTION

SUN’IY INTELLEKT TEXNOLOGIYALARI VA ULARNING KO‘P QAVATLI UYLARNI BOSHQARISH HAMDA KOMMUNAL SOHADAGI AMALIY TATBIQI

Muallif: Aziz Muxammadqulov Ixtiyor o‘g‘li

Tashkilot: O‘zbekiston Respublikasi Qurilish va uy-joy kommunal xo‘jaligi vazirligi

Manzil: Toshkent shahri

Tel: +99897 912 33 99

E-mail: azizmukhammadkulov1992@gmail.com

Annotatsiya: *Ushbu maqolada sun’iy intellekt texnologiyalarining kommunal xo‘jalik sohasida, xususan, ko‘p qavatli uylarni boshqarish tizimida qo‘llanilishi tahlil qilinadi. Ko‘p qavatli uylarda boshqaruv servis kompaniyalari faoliyatini raqamlashtirish, aholiga ko‘rsatiladigan xizmatlar sifatini oshirish, to‘lov intizomini kuchaytirish, texnik xizmat ko‘rsatishni avtomatlashtirish va “Mening uyim” billing tizimi orqali boshqaruv jarayonlarini shaffoflashtirish masalalari yoritiladi. Shuningdek, sun’iy intellekt yordamida murojaatlarni tahlil qilish, qarzdorlikni prognozlash, ta’mirlash ishlarini rejalashtirish va resurslardan samarali foydalanish imkoniyatlari ko‘rib chiqiladi.*

Kalit so‘zlar: *Sun’iy intellekt, kommunal xo‘jalik, ko‘p qavatli uylar, boshqaruv servis kompaniyasi, BSK, “Mening uyim”, billing tizimi, raqamlashtirish, energiya samaradorligi, xizmat sifati, avtomatlashtirish.*

Abstract: *This article analyzes the application of artificial intelligence technologies in the utilities sector, particularly in the management of multi-apartment residential buildings. It examines the digitalization of management service companies' operations, improving the quality of services provided to residents, strengthening payment discipline, automating technical maintenance, and enhancing the transparency of management processes through the “Mening uyim” billing system. It also considers the possibilities offered by artificial intelligence for analyzing residents' requests, forecasting debts, planning repair works, and making efficient use of resources.*

Keywords: *Artificial intelligence, utilities (communal services), multi-apartment buildings, management service company, MSC, “Mening uyim”, billing system, digitalization, energy efficiency, service quality, automation.*

KIRISH

So‘nggi yillarda kommunal xo‘jalik tizimini modernizatsiya qilish, ko‘p qavatli uy-joy fondini samarali boshqarish va aholiga ko‘rsatilayotgan xizmatlar sifatini oshirish dolzarb masalalardan biriga aylandi. Ayniqsa, ko‘p kvartirali uylar sonining ortib borishi, ularning muhandislik-kommunikatsiya tizimlariga yuklamaning ko‘payishi hamda aholining xizmatlardan foydalanish bo‘yicha talablarining oshishi boshqaruvning zamonaviy mexanizmlarini joriy etishni talab qilmoqda.

An’anaviy boshqaruv usullarida ko‘p hollarda ma’lumotlar qo‘lda yuritiladi, to‘lovlar bo‘yicha hisob-kitoblar kechikadi, murojaatlar tizimli tahlil qilinmaydi va xizmat ko‘rsatish jarayonlarida inson omiliga bog‘liq xatoliklar yuzaga keladi. Natijada boshqaruv servis kompaniyalari faoliyatida shaffoflik, tezkorlik va samaradorlik yetarli darajada ta’minlanmasligi mumkin.

Shu nuqtai nazardan, sun’iy intellekt texnologiyalari, raqamli platformalar va billing tizimlarini kommunal sohada qo‘llash katta amaliy ahamiyatga ega. Xususan, “Mening uyim” billing tizimi orqali ko‘p qavatli uylarni boshqarish, aholining to‘lovlarini hisobga olish, qarzdorlikni nazorat qilish, xizmat ko‘rsatish jarayonlarini raqamlashtirish va boshqaruv servis kompaniyalari faoliyatini avtomatlashtirish imkoniyati yaratilmoqda.

Ko‘p qavatli uylarda boshqaruv servis kompaniyalarining o‘rni

Ko‘p qavatli uylarni samarali boshqarish aholining yashash sharoitlari, uy-joy fondining texnik holati, kommunal xizmatlar uzluksizligi va umumiy mulkdan oqilona foydalanish bilan bevosita bog‘liqdir. Boshqaruv servis kompaniyalari ushbu jarayonda asosiy ijrochi subyektlardan biri hisoblanadi.

BSKlarning asosiy vazifalari quyidagilardan iborat:

ko‘p qavatli uylarning umumiy foydalanishdagi joylarini saqlash;

muhandislik tarmoqlarining texnik holatini nazorat qilish;

lift, tom, yerto‘la, kirish yo‘laklari, elektr, issiqlik va suv tarmoqlariga xizmat ko‘rsatish;

aholidan tushadigan majburiy badallar va xizmat to‘lovlarini hisobga olish;

ta’mirlash va profilaktika ishlarini tashkil etish;

fuqarolarning murojaatlarini qabul qilish va bajarilishini ta’minlash;

moliyaviy tushumlar va xarajatlar bo‘yicha shaffof hisobot yuritish.

Amaliyotda BSKlarning samarali ishlashi ko‘p jihatdan ularning raqamli boshqaruv tizimlariga ega bo‘lishiga bog‘liq. Chunki ko‘p qavatli uylar soni, xonadonlar miqdori, xizmat turlari, to‘lovlar, qarzdorliklar, ta’mirlash ishlari va murojaatlar hajmi ortib borgani sari ularni an’anaviy usulda boshqarish murakkablashadi.

Kommunal sohada raqamlashtirish - bu faqat ma’lumotlarni elektron shaklga o‘tkazish emas, balki boshqaruv jarayonlarini tubdan takomillashtirishdir. Raqamlashtirish orqali har bir xonadon, har bir to‘lov, har bir murojaat va har bir xizmat turi yagona axborot tizimida qayd etiladi.

Bu jarayon quyidagi natijalarni beradi:

to‘lovlar bo‘yicha hisob-kitoblar aniqlashadi;

qarzdorliklar real vaqt rejimida kuzatiladi;

BSK faoliyati bo‘yicha shaffoflik oshadi;

aholi va boshqaruvchi tashkilot o‘rtasidagi aloqa tezlashadi;

murojaatlarning bajarilish holati nazorat qilinadi;

xizmat ko‘rsatish sifati baholanadi;

nizoli holatlar kamayadi.

Ayniqsa, “Mening uyim” kabi billing tizimlari ko‘p qavatli uylarda boshqaruvni raqamlashtirishda muhim vosita hisoblanadi. Mazkur tizim BSKlar uchun moliyaviy hisob-kitob, aholi bilan ishlash, xizmatlar monitoringi va to‘lov intizomini shakllantirish imkonini beradi.

“Mening uyim” billing tizimining ahamiyati

“Mening uyim” billing tizimi ko‘p qavatli uylarni boshqarish jarayonida BSKlar va aholi o‘rtasidagi munosabatlarni raqamli asosda tashkil etishga xizmat qiladi. Ushbu tizim orqali har bir xonadon bo‘yicha shaxsiy hisob yuritilishi,

to‘lovlar va qarzdorliklar aks ettirilishi, xizmatlar uchun hisob-kitoblar avtomatlashtirilishi mumkin.

Tizimning asosiy afzalliklari quyidagilardan iborat:

birinchidan, aholi uchun to‘lov jarayonlari qulaylashadi. Fuqarolar o‘z xonadoni bo‘yicha hisoblangan to‘lovlarni ko‘rishi, qarzdorlik yoki ortiqcha to‘lov holatini tekshirishi mumkin;

ikkinchidan, BSKlar uchun moliyaviy nazorat kuchayadi. Har bir uy, har bir xonadon va har bir xizmat turi bo‘yicha tushumlar tahlil qilinadi;

uchinchidan, boshqaruvda shaffoflik ta’minlanadi. BSK tomonidan ko‘rsatilgan xizmatlar, amalga oshirilgan ishlar va to‘lovlar bo‘yicha ma’lumotlarni tizimli yuritish imkoniyati paydo bo‘ladi;

to‘rtinchidan, qarzdorlik bilan ishlash jarayoni soddalashadi. Tizim qarzdor xonadonlarni avtomatik aniqlashi, ogohlantirishlar yuborishi va to‘lov intizomini nazorat qilishi mumkin;

beshinchidan, statistik va tahliliy ma’lumotlar shakllanadi. Bu esa tuman, shahar yoki respublika darajasida uy-joy fondini boshqarish bo‘yicha qarorlar qabul qilishga yordam beradi.

Sun’iy intellekt texnologiyalarini “Mening uyim” billing tizimi va BSK faoliyatiga integratsiya qilish kommunal sohada yangi bosqichni boshlab berishi mumkin. Chunki sun’iy intellekt oddiy ma’lumotlar bazasi emas, balki katta hajmdagi axborotni tahlil qilish, muammolarni oldindan aniqlash va qaror qabul qilishga ko‘maklashuvchi texnologiyadir.

Sun’iy intellekt orqali xonadonlarning to‘lov tarixi, kechikish holatlari, mavsumiy to‘lov o‘zgarishlari va umumiy moliyaviy intizom tahlil qilinadi. Natijada tizim qaysi xonadonlarda kelgusida qarzdorlik yuzaga kelishi mumkinligini oldindan aniqlaydi.

Bu BSKlarga quyidagi imkoniyatlarni beradi:

qarzdorlikning oldini olish;

fuqarolarga o‘z vaqtida eslatma yuborish;

tushumlarni barqarorlashtirish;

ta’mirlash va xizmat ko‘rsatish xarajatlarini rejalashtirish.

Aholidan kelib tushadigan murojaatlar BSK faoliyatining eng muhim yo‘nalishlaridan biridir. Murojaatlar odatda lift, tomdan suv o‘tishi, yerto‘la, issiqlik, elektr, suv bosimi, chiqindi, obodonlashtirish yoki kirish yo‘laklari holati bilan bog‘liq bo‘ladi.

Sun’iy intellekt murojaatlarni quyidagicha tahlil qilishi mumkin:

murojaat mavzusini aniqlash;

dolzarblik darajasini belgilash;

takroriy shikoyatlarni ajratish;

muammo qaysi uy yoki hududda ko‘p uchrayotganini aniqlash;

mas’ul xodimga avtomatik yo‘naltirish.

Bu orqali murojaatlar bilan ishlashda tezkorlik oshadi va fuqarolarning noroziligi kamayadi.

Ko‘p qavatli uylarda lift, elektr ta’minoti, suv tarmoqlari, kanalizatsiya, tom va yerto‘la kabi obyektlar doimiy texnik nazoratni talab qiladi. An’anaviy yondashuvda ta’mirlash ko‘pincha nosozlik yuzaga kelgandan keyin amalga oshiriladi. Sun’iy intellekt esa profilaktik yondashuvni kuchaytiradi.

Masalan, tizim quyidagilarni tahlil qilishi mumkin:

avvalgi nosozliklar tarixi;

murojaatlar soni;

ta’mirlash xarajatlari;

obyektning foydalanish muddati;

mavsumiy xavf omillari.

Natijada qaysi uylarda tom ta’miri, qaysi joyda lift profilaktikasi yoki qaysi tarmoqda nosozlik xavfi yuqori ekanligi oldindan aniqlanadi.

BSK faoliyatida mablag‘lardan samarali foydalanish muhim ahamiyatga ega. Sun’iy intellekt tushumlar, xarajatlar, bajarilgan ishlar va xizmatlar hajmini solishtirib, qaysi yo‘nalishda ortiqcha xarajat borligini aniqlashi mumkin.

Masalan:

bir uyda obodonlashtirish xarajati yuqori, ammo murojaatlar soni kamaymagan bo‘lsa;

ayrim xizmatlar uchun ko‘p mablag‘ sarflangan, lekin natija past bo‘lsa;

ta’mirlash ishlari muntazam takrorlanayotgan bo‘lsa;

sun’iy intellekt bu holatlarni tahlil qilib, boshqaruv qarorlarini takomillashtirishga yordam beradi.

Energiya samaradorligi va resurslardan oqilona foydalanish

Ko‘p qavatli uylarda energiya samaradorligi masalasi kommunal sohaning eng muhim yo‘nalishlaridan biridir. Issiqlik, elektr energiyasi, suv va boshqa resurslarning ortiqcha sarflanishi nafaqat aholining xarajatlarini oshiradi, balki kommunal tizimlarga ham ortiqcha yuklama beradi.

Sun’iy intellekt yordamida:

uylarning energiya iste’moli tahlil qilinadi;

ortiqcha sarf holatlari aniqlanadi;

mavsumiy iste’mol prognoz qilinadi;

energiya tejamkor choralar taklif etiladi;

umumiy foydalanish joylarida elektr sarfi nazorat qilinadi.

Masalan, kirish yo‘laklari va umumiy hududlarda yoritish tizimlarini avtomatlashtirish, sensorli chiroqlarni joriy etish, issiqlik yo‘qotishlarini tahlil qilish va binolarning texnik holatini baholash orqali resurslardan samarali foydalanish mumkin.

“Mening uyim” billing tizimi mavjud hisob-kitob va ma’lumotlar bazasini shakllantirsa, sun’iy intellekt ushbu ma’lumotlarni chuqur tahlil qilib, boshqaruv qarorlarini qabul qilishda yordam beradi.

Bunday integratsiya quyidagi yo‘nalishlarda samarali bo‘ladi:

to‘lovlar bo‘yicha avtomatik tahlil;

qarzdorlik xavfini oldindan aniqlash;

murojaatlarni avtomatik guruhlash;

ta’mirlash ishlari ustuvorligini belgilash;

uylar kesimida reyting shakllantirish;

BSKlar faoliyati samaradorligini baholash;

aholiga xizmat ko‘rsatish sifatini monitoring qilish.

Bu esa BSKlar faoliyatini oddiy ijrochi tashkilotdan ma’lumotlarga asoslangan zamonaviy boshqaruv subyektiga aylantiradi.

Amaliy natijalar

Sun’iy intellekt va raqamli billing tizimlarini BSK faoliyatiga joriy etish natijasida quyidagi amaliy natijalarga erishish mumkin:

aholi murojaatlariga javob berish muddati qisqaradi;

to‘lov intizomi yaxshilanadi;

qarzdorlik darajasi kamayadi;

xizmat ko‘rsatish jarayonlari shaffoflashadi;

ta’mirlash ishlari rejalashtirilgan holda amalga oshiriladi;

resurslardan foydalanish samaradorligi oshadi;

BSKlar faoliyati bo‘yicha aniq statistik ma’lumotlar shakllanadi;

aholi va boshqaruv tashkilotlari o‘rtasida ishonch ortadi.

Ayniqsa, tuman miqyosida bir nechta BSK faoliyati yagona raqamli tizim orqali kuzatilsa, mahalliy ijro organlari uchun real holatni baholash, muammoli hududlarni aniqlash va tezkor choralar ko‘rish imkoniyati kengayadi.

Muammolar va takliflar

Mazkur yo‘nalishda ayrim muammolar ham mavjud. Jumladan:

barcha BSKlarda raqamli savodxonlik darajasi bir xil emas;

ayrim xodimlar an’anaviy ish uslubidan voz kechishga qiynaladi;

ma’lumotlarni to‘liq va sifatli kiritish bo‘yicha muammolar mavjud;

aholining raqamli xizmatlardan foydalanish ko‘nikmasi yetarli emas;

texnik infratuzilma doim ham talab darajasida emas.

Ushbu muammolarni bartaraf etish uchun quyidagi takliflar maqsadga muvofiq:

BSK xodimlari uchun raqamli tizimlardan foydalanish bo‘yicha o‘quv kurslarini tashkil etish;

“Mening uyim” billing tizimidan foydalanish bo‘yicha yagona metodik qo‘llanma ishlab chiqish;

aholi uchun mobil ilova va shaxsiy kabinet imkoniyatlarini kengaytirish;

BSKlar faoliyatini baholashda raqamli ko‘rsatkichlardan foydalanish;

sun’iy intellekt asosida avtomatik tahliliy hisobotlar shakllantirish;

qarzdorlik, murojaatlar va texnik xizmatlar bo‘yicha reyting tizimini joriy etish.

XULOSA

Xulosa qilib aytganda, sun’iy intellekt texnologiyalari va “Mening uyim” billing tizimi kommunal sohada, ayniqsa ko‘p qavatli uylarni boshqarishda katta amaliy ahamiyatga ega. Boshqaruv servis kompaniyalari faoliyatini raqamlashtirish orqali hisob-kitoblar aniqlashadi, xizmat ko‘rsatish sifati oshadi, qarzdorlik kamayadi va boshqaruv jarayonlari shaffoflashadi.

Sun’iy intellekt esa ushbu jarayonni yanada yuqori bosqichga olib chiqadi. U ma’lumotlarni oddiy saqlash bilan cheklanmay, ularni tahlil qiladi, muammolarni oldindan aniqlaydi va boshqaruv qarorlarini ilmiy asoslashga xizmat qiladi.

Shu bois ko‘p qavatli uylarni boshqarish tizimida sun’iy intellekt va raqamli billing platformalarini keng joriy etish kommunal sohaning zamonaviy, shaffof va samarali rivojlanishi uchun muhim omil hisoblanadi.

FOYDALANILGAN ADABIYOTLAR RO‘YXATI

1. O‘zbekiston Respublikasi Prezidentining 2026-yil 5-fevraldagi PQ-48-son qarori**.**
2. O‘zbekiston Respublikasi Vazirlar Mahkamasining 2024-yil 21-noyabrdagi 778-son qarori
3. O‘zbekiston Respublikasi Uy-joy kodeksi
4. Birlashgan Millatlar Tashkiloti. *E-Government Survey 2022: The Future of Digital Government*. – New York, 2022.
5. Jahon banki. *Digital Development Overview*. – Washington, 2021.
6. International Energy Agency. *Energy Efficiency 2022*. – Paris, 2022.
7. McKinsey & Company. *The State of AI in 2023*. – 2023.

SEARCHING, FILTERING, AND VERIFYING INFORMATION USING GENERATIVE ARTIFICIAL INTELLIGENCE TOOLS

Bekzod Khaitboyevich Baydjanov –

Associate Professor, Fergana State University; Doctor of Philosophy (PhD) in Pedagogical Sciences

E-mail: baybekzod@gmail.com;

Tel.: (+998-91) 667-01-51;

ORCID: https://orcid.org/0000-0002-1580-8569

Abstract. *The rapid integration of generative artificial intelligence (GenAI) into education has changed the logic of information work: learners can formulate queries, obtain summaries, compare viewpoints, and generate preliminary explanations within seconds. At the same time, fluent AI-generated responses may contain outdated, incomplete, biased, or fabricated information, which makes verification a necessary component of information-analytical competence. This article examines how GenAI tools can be pedagogically used for three interconnected operations: searching, filtering, and verifying information. The study adopts a theoretical-conceptual design based on comparative analysis of international guidance, peer-reviewed research on AI literacy and large language models, and recent evidence concerning hallucination and retrieval-augmented generation.*

Keywords: *generative artificial intelligence, information search, information filtering, verification, AI literacy, information-analytical competence, critical thinking, source evaluation, hallucination.*

INTRADUCTION

Generative artificial intelligence has become an important part of contemporary information environments because large language models can synthesize text, reformulate questions, summarize documents, generate keywords, and support exploratory analysis. In higher education, these functions create new opportunities for students who work with large and rapidly changing information flows. However, the educational value of GenAI does not lie in the speed of answer generation itself. It depends on whether the learner can transform an AI-

produced response into a transparent evidence chain consisting of a well-defined information need, identifiable sources, relevant evidence, and a justified conclusion. UNESCO therefore recommends a human-centred approach in which GenAI strengthens human agency rather than replacing judgement, while educational institutions retain responsibility for ethical and pedagogically appropriate use [1]. The problem becomes especially significant in the development of information-analytical competence. Traditional information literacy required the learner to formulate a search request, locate sources, evaluate authority, compare evidence, and interpret results. GenAI compresses several of these operations into one conversational interface. A learner may ask a single question and receive an apparently coherent synthesis without directly observing how the evidence was selected. This convenience produces a new pedagogical contradiction: access to information becomes easier, but the epistemic work required to assess the reliability of that information becomes less visible. Research on large language models in education has consequently emphasized critical thinking, fact checking, human oversight, and awareness of model limitations as necessary conditions for responsible use [2].

The need for verification is not theoretical. Natural-language generation systems can produce hallucinations: statements that are fluent and contextually plausible but unsupported or incorrect [3]. Even when a model provides references, bibliographic details may be inaccurate or invented. At the same time, recent retrieval-augmented generation approaches show that connecting models to external sources can improve traceability and factual grounding, although retrieval quality and source selection remain critical [4]. Therefore, GenAI should be approached as an interactive layer for information processing rather than as an autonomous authority. The learner must be able to separate generation from evidence.

The study used a theoretical-conceptual design. Its source base included international guidance on generative AI in education, peer-reviewed research on AI literacy and educational applications of large language models, scholarship on

hallucination in natural-language generation, and recent work on retrieval-augmented generation. The analysis focused on sources that directly address at least one of four issues: responsible educational use of GenAI; competencies required for critical AI use; factuality and hallucination; or the relationship between generative models and external information sources. This design was selected because the purpose of the article is not to report an experimental effect size, but to construct a pedagogically coherent procedure from established findings.

Four analytical methods were employed. First, conceptual analysis was used to distinguish information search, filtering, and verification as different cognitive operations. Second, comparative analysis identified tasks that can reasonably be delegated to GenAI and tasks that require human judgement. Third, risk analysis was used to connect each operation with characteristic failure modes such as fabricated citations, relevance drift, confirmation bias, or overreliance on generated summaries. Fourth, pedagogical modelling was used to combine these findings into a sequence that can be taught, observed, and assessed. The resulting framework was also aligned with established descriptions of AI literacy that include understanding AI, applying it, evaluating its outputs, and considering ethical implications [5]. Within the model, “search” means constructing and expanding an information request and identifying candidate sources; “filter” means reducing the information set according to relevance, authority, recency, methodological quality, and task-specific criteria; and “verify” means checking individual claims against accessible evidence, tracing information to primary or authoritative sources, and triangulating important statements across independent sources. This distinction prevents a common methodological error in which an AI answer is treated simultaneously as a search result, summary, and proof.

The analysis resulted in the Search Filter Verify (SFV) framework. Its central principle is functional asymmetry: GenAI is strong at linguistic transformation, query expansion, clustering, comparison, and synthesis, whereas final decisions about source reliability and evidential sufficiency must remain with

the learner. In this sense, GenAI performs cognitive support functions, but epistemic responsibility is not delegated. The three stages are sequential but iterative. Verification may expose a gap that requires a new search; filtering may reveal contradictory sources that require a narrower query; and a search may be reformulated when the model produces concepts that are too broad or ambiguous. At the search stage, students can use GenAI to translate a research problem into alternative keywords, synonyms, Boolean-style combinations, disciplinary terms, and multilingual equivalents. The model can also suggest categories of primary and secondary sources, relevant databases, and possible counter-arguments. However, the output should be converted into actual searches in bibliographic databases, institutional repositories, official websites, or other traceable information systems. This practice preserves the distinction between a generated suggestion and a retrieved source. At the filtering stage, GenAI can help organize a candidate corpus by topic, methodology, publication date, population, or type of evidence. It can produce comparison matrices and identify duplicated or semantically overlapping items. Yet automated filtering must be checked against explicit criteria. A highly relevant source may still be methodologically weak, a recent source may merely repeat older claims, and a frequently cited statement may not be supported by the original study. Thus, the learner needs predefined inclusion and exclusion criteria rather than accepting the model's ranking as neutral. At the verification stage, the unit of analysis changes from the document to the claim. Each important factual statement should be linked to a source that can be opened and examined. The learner checks whether the source actually contains the claim, whether the cited evidence is primary or derivative, whether the date and context match the current question, and whether independent sources converge. For high-stakes or central claims, verification should involve at least one authoritative or primary source and, when possible, corroboration from an independent source. This stage directly addresses the hallucination problem documented in research on natural-language generation [3] and the broader

responsible-AI concern that fluent language should not be confused with factual accuracy [6].

Table 1.

Search–Filter–Verify framework for pedagogical use of generative AI

Stage	GenAI-supported operation	Required human analytical action	Main verification criterion	Expected product
Search	Generate keywords, synonyms, query variants, source categories and counter-questions	Formulate the information need; run searches in traceable databases and repositories	Retrievability and traceability of candidate sources	Documented source pool
Filter	Cluster, summarize, compare and classify candidate materials	Apply explicit relevance, authority, recency and methodological-quality criteria	Fit between source quality and research task	Reduced and structured evidence set
Verify	Extract claims, identify contradictions, propose checks and cross-source comparisons	Open the source; confirm claim–evidence match; trace provenance; triangulate key claims	Primary/authoritative evidence and independent corroboration	Verified claim-evidence chain

The framework also yields a practical rule for prompting: a prompt should not merely request an answer; it should make the evidence procedure visible. For example, students can instruct a GenAI system to distinguish confirmed facts from hypotheses, list the exact claims that require external verification, identify what type of source would be appropriate for each claim, and flag missing or uncertain evidence. Such prompts support metacognition because they transform the dialogue from “give me the answer” into “show me what must be checked.” This shifts the learner from passive consumption to active analytical control.

A second result concerns documentation. Students should maintain a verification log containing the original claim, AI output, retrieved source, checked passage or data point, verification outcome, and final decision. This log can be assessed by the teacher and makes the use of GenAI academically transparent. It also creates a bridge between AI literacy and information-analytical competence: the student demonstrates not only the ability to obtain information, but also the ability to justify why particular information was retained or rejected.

The SFV framework supports a balanced interpretation of GenAI in education. On one side, prohibiting generative tools would ignore their real capacity to accelerate exploratory searching, vocabulary expansion, summarization, and comparative analysis. On the other side, treating them as reliable answer engines would weaken students' contact with original evidence and may encourage cognitive outsourcing. Kasneci et al. argue that educational use of large language models requires specific literacies, critical evaluation, and fact-checking strategies [2]. The present framework operationalizes this requirement by making verification a separate and mandatory stage rather than an optional final check. The framework also corresponds with contemporary AI-literacy models. Ng et al. describe AI literacy through understanding, use, evaluation, and ethics [5]. In the SFV model, these dimensions are embedded in the workflow: understanding is required to recognize model limitations; use is represented by purposeful search and filtering; evaluation is concentrated in source and claim verification; and ethics appears in transparent attribution, privacy awareness, and responsible decision making. This integration is pedagogically important because AI literacy should not be taught only as knowledge about algorithms. It must also be expressed in disciplined information behaviour.

Retrieval-augmented generation further clarifies the boundary between generation and evidence. By connecting a language model to external documents, RAG can improve access to current or domain-specific information and can make supporting passages more visible [4]. Nevertheless, retrieval does not remove the need for human checking. The retrieved set may be incomplete, ranking may be

suboptimal, source quality may vary, and generated synthesis may still misrepresent the source. Therefore, the presence of citations in an AI interface should be treated as an invitation to inspect evidence, not as a guarantee of truth. From a pedagogical perspective, the most valuable outcome is the development of epistemic independence. Students should be able to ask: What is the original source? Is this a primary or secondary claim? Does the source actually support the wording? Is the information current for the population and time period under study? What evidence would falsify this statement? These questions are transferable across disciplines and protect the learner from both AI-specific errors and traditional misinformation. The 2025 Stanford AI Index notes continued challenges in factuality and truthfulness despite rapid model progress, reinforcing the need for independent evaluation [6]. A further implication concerns assessment. If students are permitted to use GenAI, assessment criteria should evaluate the quality of the information process rather than merely the fluency of the final text. Teachers can require a short verification appendix or log showing the search formulation, the reason for selecting specific sources, the claims that were checked, and any AI-generated statements that were rejected. Such evidence makes analytical work visible and discourages uncritical copying. It also allows assessment to focus on judgement, traceability, and methodological discipline - competencies that remain distinctly human even when text generation is automated.

Prompt design should likewise be taught as part of analytical literacy rather than as a collection of technical tricks. Strong prompts specify the task, the scope, the type of source required, the time frame, and the uncertainty that the model should report. They can ask the model to separate factual claims from interpretation, identify assumptions, provide alternative explanations, and formulate verification questions. Nevertheless, a sophisticated prompt does not guarantee a correct answer. Its pedagogical value lies in helping the learner externalize a reasoning plan that can then be tested against evidence. Ethical transparency is another condition of responsible use. Students should disclose

substantial GenAI assistance when institutional rules require it, avoid uploading confidential or personally identifiable information, and distinguish their own analytical conclusions from machine-generated suggestions. UNESCO's human-centred approach is particularly relevant here because the objective is not maximal automation but meaningful augmentation of human learning [1]. In information-analytical training, this means preserving the learner's responsibility for interpretation, citation, and final claims while using AI to reduce routine cognitive load and widen the space for comparison and critical inquiry.

Generative AI changes the speed and form of information activity, but it does not eliminate the pedagogical need for critical search, selection, and verification. The proposed Search–Filter–Verify framework treats GenAI as an instrument for expanding queries, structuring candidate information, and supporting claim analysis, while reserving source evaluation and final judgement for the learner. Its main methodological requirement is the separation of generated language from verified evidence. For educational practice, three rules follow. First, AI-generated references or claims should never be accepted without opening and checking the underlying source. Second, filtering should be based on explicit criteria of relevance, authority, recency, and methodological quality. Third, key claims should be triangulated and documented in a transparent claim-evidence chain. When these rules are embedded in teaching, GenAI can contribute to information-analytical competence by increasing efficiency while simultaneously strengthening critical thinking, source awareness, and responsible academic practice.

REFERENCES

1. UNESCO. Guidance for Generative AI in Education and Research. – Paris: UNESCO, 2023. – 44 p.

2. Kasneci E., Sessler K., Küchemann S. et al. ChatGPT for good? On opportunities and challenges of large language models for education Learning and Individual Differences. – 2023. – Vol. 103.

3. Ji Z., Lee N., Frieske R., Yu T., Su D., Xu Y., Ishii E., Bang Y.J., Madotto A., Fung P. Survey of hallucination in natural language generation ACM Computing Surveys. – 2023. – Vol. 55. – No. 12. – Article 248. – P. 1–38.

4. Gao Y., Xiong Y., Gao X., Jia K., Pan J., Bi Y., Dai Y., Sun J., Wang M., Wang H. Retrieval-Augmented Generation for Large Language Models: A Survey arXiv. – 2023.

5. Stanford Institute for Human-Centered Artificial Intelligence. Artificial Intelligence Index Report 2025. – Stanford, CA: Stanford University, 2025.

6. Chiu T.K.F., Xia Q., Zhou X., Chai C.S., Cheng M. Systematic literature review on opportunities, challenges, and future research recommendations of artificial intelligence in education Computers and Education: Artificial Intelligence. – 2023.

7. Ng D.T.K., Leung J.K.L., Chu K.W.S., Qiao M.S. AI literacy: Definition, teaching, evaluation and ethical issues Proceedings of the Association for Information Science and Technology. – 2021. – Vol. 58. – No. 1. – P. 504–509.

8. Baydjanov B.X. Teacher's Digital Competences as a Factor in the Development of Students' Information-Analytical Competence // American Journal of Social and Humanitarian Research. – 2025. – Vol. 6. – No. 3. – P. 499–506. – DOI: 10.31150/ajshr.v6i3.3366.

9. Байджанов Б.Х. Технология Big Data как средство развития у студентов информационно-аналитических навыков // Среднее профессиональное образование. – Москва, 2025. – № 6. – С. 41–49.

10. Baydjanov B.X. Germenevtik texnologiya vositasida talabalarda informatsion-analitik kompetentlikni rivojlantirish samaradorligi // Tadbirkorlik va pedagogika. – 2025. – J. 3. – № 4. – B. 87–96. – DOI: 10.71337/inlibrary.uz.entrepreneurship-pedagogy.58983.

11. Baydjanov B.X., Madaliev B.E., Dudek J. Applied digital verification and analytics architecture for structured competence modeling in digital learning environments // ESE-2026 Conference Proceedings. – Tashkent, 2026. – P. 277–280.

THEORETICAL FOUNDATIONS FOR DESIGNING AN AI-BASED METHODOLOGY

Amilxanova Nigina Orinboy qizi

English Teacher, Secondary School No. 100,

Yakkasaray District, Tashkent, Uzbekistan

E-mail: niginaamilxanova97@mail.ru

Abstract. *This study examines the theoretical foundations for designing an AI-based methodology for developing English communicative competence among high school learners. It analyzes recent pedagogical approaches that integrate artificial intelligence into communicative language teaching, emphasizing adaptive learning, personalized instruction, learner autonomy, and authentic interaction. The study argues that effective AI integration depends on sound pedagogical design rather than technology itself.*

Keywords: *AI-assisted learning; communicative language teaching; adaptive learning; personalized learning; learner autonomy; methodology.*

Аннотация. *В настоящем исследовании рассматриваются теоретические основы проектирования методики развития коммуникативной компетенции по английскому языку у учащихся старших классов на основе технологий искусственного интеллекта. Анализируются современные педагогические подходы к интеграции искусственного интеллекта в коммуникативное обучение иностранному языку с акцентом на адаптивное обучение, персонализированное обучение, автономность обучающихся и аутентичное коммуникативное взаимодействие.*

Ключевые слова: *обучение с использованием искусственного интеллекта; коммуникативное обучение иностранному языку; адаптивное обучение; персонализированное обучение; автономность обучающихся; методика.*

Annotatsiya. *Ushbu tadqiqotda yuqori sinf o‘quvchilarida ingliz tili bo‘yicha kommunikativ kompetensiyani sun’iy intellekt asosidagi metodika yordamida rivojlantirishning nazariy asoslari tahlil qilinadi. Tadqiqotda sun’iy intellektni kommunikativ til o‘qitish jarayoniga integratsiya qiluvchi zamonaviy pedagogik yondashuvlar ko‘rib chiqilib, adaptiv ta’lim, shaxsga yo‘naltirilgan o‘qitish, o‘quvchilarning mustaqil ta’lim olishi hamda autentik kommunikativ o‘zaro ta’sir masalalariga alohida e’tibor qaratiladi.*

Kalit so‘zlar: *sun’iy intellekt asosidagi ta’lim; kommunikativ til o‘qitish; adaptiv ta’lim; shaxsga yo‘naltirilgan ta’lim; o‘quvchilarning mustaqil ta’lim olishi; metodika.*

INTRODUCTION

The rapid expansion of artificial intelligence in education has generated a paradigm shift in the conceptualization of language teaching methodology. While previous technological innovations primarily supplemented conventional instructional practices, contemporary AI technologies have become capable of transforming the entire teaching and learning process. Consequently, the development of an AI-based methodology should not be regarded as the simple incorporation of digital tools into existing pedagogical models. Rather, it requires a systematic reconsideration of methodological principles governing communicative language teaching, learner engagement, instructional design, assessment, and classroom interaction. Recent educational research emphasizes that effective AI integration depends primarily on pedagogy rather than technology itself. Lo argues that artificial intelligence does not automatically improve learning outcomes; instead, its educational effectiveness is determined by the methodological framework within which it is implemented. According to the author, AI should function as a cognitive scaffold that facilitates learners' active construction of knowledge rather than merely providing ready-made answers. Therefore, instructional design remains the decisive factor influencing the educational value of AI-assisted learning [1, p. 11]. This pedagogical perspective is closely associated with constructivist learning theory, which views learning as an active process of knowledge construction through interaction, reflection, and problem-solving. Within AI-supported environments, learners are encouraged to negotiate meaning, formulate questions, analyze alternative linguistic expressions, and evaluate the appropriateness of communicative responses. Such learning activities correspond closely to the principles of communicative language teaching, where meaningful communication constitutes both the objective and the primary means of language acquisition. Another theoretical foundation for designing an AI-based methodology is adaptive learning. Unlike traditional

classroom instruction, which often follows a uniform sequence of activities regardless of individual learner differences, AI systems continuously analyze learners' performance and modify instructional content accordingly. This adaptability enables teachers to provide differentiated instruction without increasing classroom workload. Research demonstrates that adaptive learning environments significantly improve learner motivation, engagement, and academic achievement because instructional tasks correspond more closely to learners' current proficiency levels and learning needs [2, p. 63].

According to Sharples, generative AI should be conceptualized as a collaborative educational partner rather than an automated information retrieval system. Educational interaction with AI involves dialogue, reflection, negotiation, and collaborative knowledge construction. The researcher argues that meaningful learning emerges through continuous interaction between learners and intelligent systems, where artificial intelligence stimulates inquiry instead of replacing human thinking [3, p. 164].

An equally important theoretical principle concerns personalized learning. Contemporary educational psychology consistently recognizes learner individuality as a fundamental determinant of successful instruction. Differences in motivation, learning strategies, cognitive styles, emotional factors, and linguistic backgrounds require flexible instructional approaches capable of addressing diverse educational needs. Artificial intelligence offers unprecedented opportunities for personalization because it continuously collects learning analytics and adapts instructional content in real time. Zhai maintains that AI-assisted education enables highly individualized learning experiences by adjusting linguistic complexity, selecting appropriate communicative scenarios, monitoring learner progress, and providing customized recommendations for improvement. Such personalization significantly enhances learners' engagement while simultaneously reducing cognitive overload and language anxiety [4, p. 8].

Psychological factors represent another essential component of AI-based methodology. Numerous studies have demonstrated that foreign language anxiety

remains one of the principal barriers preventing learners from participating actively in communicative activities. Fear of making mistakes, negative evaluation, and public speaking frequently reduce learners' willingness to communicate, particularly in secondary education. Recent investigations by AlTwijri and Alghizzi indicate that conversational AI systems contribute to reducing language anxiety by providing psychologically safe learning environments in which learners can practice communication without fear of criticism or embarrassment. Because AI responds patiently, consistently, and without negative emotional judgment, learners gradually develop greater confidence and communicative self-efficacy, which subsequently improves classroom participation and oral performance [5, p. 15].

The proposed methodology in this study is based on five interconnected theoretical principles:

Communicative authenticity – learning activities should simulate realistic communicative situations.

Adaptive personalization – instructional tasks should be adjusted according to learners' proficiency, needs, and progress.

AI-mediated interaction – artificial intelligence should function as a communicative partner that facilitates meaningful dialogue.

Reflective learning – learners should critically evaluate AI-generated responses and develop independent communicative judgment.

Human-centered pedagogy teachers remain responsible for instructional design, ethical guidance, and educational decision-making, while AI serves as an intelligent pedagogical assistant.

Collectively, these principles constitute the theoretical framework for designing an innovative methodology aimed at developing English communicative competence among high school learners.

CONCLUSION

The theoretical analysis demonstrates that designing an AI-based methodology for developing communicative competence requires the integration

of contemporary pedagogical theories with the capabilities of artificial intelligence. Recent studies indicate that AI should not be viewed merely as a technological innovation but as a pedagogically meaningful tool that supports learner-centered instruction, adaptive learning, authentic communication, and continuous formative assessment. Its effectiveness depends largely on sound instructional design and teachers' ability to integrate AI into communicative language teaching in a purposeful and pedagogically appropriate manner.

REFERENCES

1. Lo C. K. A systematic review of the applications of ChatGPT in artificial intelligence-assisted language learning: Benefits, challenges, and future directions // Smart Learning Environments. 2024. Vol. 11. Art. 10.

2. Holmes W., Bialik M., Fadel C. Artificial Intelligence in Education: Promises and Implications for Teaching and Learning. Boston: Center for Curriculum Redesign, 2019. 240 p.

3. Sharples M. Towards social generative AI for education: Theory, practices and ethics // Learning, Media and Technology. 2024. Vol. 49. No. 2. P. 159–167.

4. Zhai X. ChatGPT in education: Opportunities, challenges, and future research // The Innovation. 2024. Vol. 5. No. 1. Art. 100612.

5. AlTwijri L., Alghizzi T. Artificial intelligence applications in English language learning: Effects on learners' motivation, anxiety, and engagement // Education and Information Technologies. 2024. Vol. 29. P. 10345–10369.

THE EFFECT OF PHET INTERACTIVE SIMULATIONS AND ARTIFICIAL INTELLIGENCE-BASED LEARNING ON SEVENTH-GRADE STUDENTS' PHYSICS ACHIEVEMENT

Satimova Mukambarkhon Davlatovna

Independent researcher at the A. Avloni

ORCID: https://orcid.org/0009-0005-1197-4905

Abstract: *The integration of digital technologies into science education has created new opportunities for improving teaching effectiveness and student learning outcomes. This study investigates the effectiveness of interactive technologies, particularly PhET Interactive Simulations combined with Artificial Intelligence (AI)-supported learning approaches, in teaching physics at the secondary school level. A quasi-experimental research design was conducted among 60 seventh-grade students from general secondary schools. The participants were divided into an experimental group and a control group, with 30 students in each group. During a two-month intervention, the experimental group studied physics topics related to motion and force using PhET simulations, digital learning activities, and AI-supported feedback tools, while the control group received traditional instruction. The results demonstrated greater improvement in the experimental group: its mean achievement increased from 62.4% to 86.7%, compared with an increase from 61.8% to 72.5% in the control group. Students using the integrated approach also demonstrated stronger conceptual understanding, higher participation, and positive perceptions of technology-supported learning. PhET simulations provided opportunities to visualize abstract physical concepts, manipulate variables, and conduct virtual experiments, while AI-supported activities contributed personalized feedback and support for individual learning needs. The findings indicate that the combined use of simulation and AI can support student-centered physics learning when accompanied by appropriate pedagogical planning and teacher guidance.*

Keywords: *interactive technologies, physics education, PhET simulations, artificial intelligence, STEM education, digital learning, secondary education.*

1. INTRODUCTION

The rapid development of digital technologies has significantly influenced educational practices worldwide. Modern education is increasingly moving from traditional teacher-centered approaches toward student-centered learning environments that encourage active participation, critical thinking, independent knowledge construction, and collaboration. In science education, particularly physics, interactive technologies have become an important means of supporting students' understanding of complex scientific concepts.

Physics contains many abstract ideas that are difficult to understand through textbook explanations and lectures alone. Concepts related to motion, force, energy, and interactions between objects often require visualization and practical investigation. In a conventional classroom, opportunities to manipulate variables and repeatedly observe physical processes can be limited by available equipment, lesson time, and class size. Digital tools that support visualization, experimentation, and inquiry-based learning can therefore complement established teaching practices.

Interactive technologies give learners opportunities to participate directly in the learning process. Digital simulations, virtual laboratories, multimedia resources, and online assessment systems allow students to observe scientific processes, manipulate variables, formulate predictions, and receive feedback. Such activities can help learners connect theoretical knowledge with practical situations and develop more meaningful conceptual representations.

PhET Interactive Simulations, developed by the University of Colorado Boulder, is a prominent example of a research-based simulation environment. PhET simulations allow learners to explore scientific models interactively, change parameters, observe outcomes, and explain relationships on the basis of evidence. In physics, simulations concerning motion, force, electricity, energy, and waves can make otherwise abstract relationships visible and manipulable.

Artificial Intelligence (AI) has also emerged as an important educational technology. AI-supported systems can analyze learners' responses, provide individualized explanations, identify learning difficulties, and support adaptive

learning. In physics education, these functions may complement simulations by helping students interpret results and by giving teachers additional information about students' progress.

The combination of PhET simulations and AI creates a learning environment in which students can investigate phenomena while receiving individualized guidance. Such integration is relevant to the development of problem-solving, digital literacy, creativity, and scientific reasoning. At the same time, AI should remain a supportive instrument: effective implementation depends on teacher preparation, pedagogical design, ethical practice, and appropriate attention to data privacy.

Although previous research has examined the benefits of digital simulations and AI-supported education, further experimental work is needed on their combined use in secondary-school physics, particularly with younger learners studying foundational concepts. The present study addresses this need by examining seventh-grade students learning motion and force.

Research question: How does the integration of PhET Interactive Simulations and Artificial Intelligence-supported learning influence students' learning outcomes in physics education?

The study evaluates three closely related outcomes: academic achievement, conceptual understanding, and student engagement during physics learning activities.

2. LITERATURE REVIEW

2.1. Interactive Technologies in Science Education

Interactive technologies have become an important area of research in science education because they can shift learners from passive reception of information toward active exploration. Technology-enhanced environments can provide opportunities to formulate hypotheses, test ideas, analyze observations, and revise explanations. These processes are consistent with constructivist approaches in which learners build knowledge through meaningful activity and experience. *(Perkins et al., 2006, pp. 18–23).*

In physics, interactive visualization is especially valuable because many processes cannot be observed directly or are difficult to reproduce repeatedly in a school laboratory. Dynamic representations can help students form mental models of relationships among variables. Digital environments may also allow learners to repeat an investigation, compare different conditions, and immediately see the consequences of changing a parameter. *(Perkins et al., 2006, pp. 18–23).*

2.2. PhET Interactive Simulations in Physics Education

PhET provides free, research-based simulations designed for science learning. Its virtual environments enable students to interact with models rather than merely observe static diagrams. For example, in lessons on force and motion, learners can change mass, applied force, or friction and observe how the movement of an object changes. This supports understanding of relationships instead of relying exclusively on memorization. *(Perkins et al., 2006, pp. 18–23).*

The literature cited in the source article identifies Perkins et al. (2006) and Wieman, Adams, and Perkins (2008) as important studies demonstrating the educational value of PhET. The source also emphasizes that simulations are not necessarily replacements for real laboratory work; rather, they can complement physical experiments and expand learning opportunities where equipment, time, or other resources are limited. *(Perkins et al., 2006, pp. 18–23; Wieman et al., 2008, pp. 682–683).*

2.3. Artificial Intelligence in Education

AI-supported education can provide individualized assistance by analyzing responses and learning patterns. Such systems may generate feedback, explain errors, recommend additional activities, and provide learning analytics to teachers. These functions are potentially useful in physics classrooms, where students can have different learning speeds and different misconceptions. *(Chen et al., 2020, pp. 75264–75278).*

The educational value of AI depends on how it is integrated into pedagogy. The source article stresses teacher preparation, ethical considerations, and data privacy. AI is described as a supportive technology rather than a replacement for

educators. Teachers remain responsible for selecting learning objectives, designing meaningful activities, interpreting evidence, and guiding students' scientific reasoning. *(Chen et al., 2020, pp. 75264–75278).*

2.4. Integration of PhET and Artificial Intelligence

PhET and AI offer complementary functions. PhET supplies an interactive environment in which students explore physical phenomena, whereas AI-supported learning can provide personalized feedback and identify areas requiring additional explanation. For example, a student may manipulate force, mass, and friction in a simulation and then receive targeted support when interpreting the resulting motion.

The integrated approach is therefore expected to support conceptual understanding, motivation, personalized learning, critical thinking, and scientific inquiry. Its value lies not simply in adding technologies to a lesson, but in coordinating simulation, questioning, feedback, and reflection around explicit learning objectives.

2.5. Research Gap

The source article identifies a need for additional experimental research on the combined use of interactive simulations and AI in secondary-school physics. In particular, relatively limited attention has been given to seventh-grade learners studying fundamental concepts such as motion and force. The present study contributes to this area by using a quasi-experimental pre-test/post-test design.

3. METHODS

3.1. Research Design

A quasi-experimental pre-test and post-test control-group design was used. Both groups completed an initial assessment before instruction and a final assessment after the two-month intervention. The comparison focused on changes in achievement and on qualitative indicators of engagement and conceptual understanding.

3.2. Participants and Research Context

The participants were 60 seventh-grade students from two classes in general secondary schools. Thirty students formed the experimental group and thirty formed the control group. Both groups studied the same curriculum content and the same topics; the principal difference was the instructional approach.

3.3. Learning Topics and Intervention

The intervention lasted two months and focused on motion and force. The selected content included types of motion, interaction between forces and objects, effects of force on movement, relationships among physical variables, and applications of Newton's laws in everyday situations.

The experimental group used PhET simulations as virtual experimental tools. Students changed relevant parameters, observed outcomes, tested predictions, discussed evidence, and connected observations with theoretical explanations. AI-supported activities were used to provide personalized feedback, identify difficulties, and offer additional explanations or recommendations.

The control group studied the same topics through traditional instructional approaches, including teacher explanations, textbook exercises, classroom discussions, and standard problem-solving activities. This arrangement allowed the study to focus on the difference associated with the instructional technology rather than a difference in curriculum content.

3.4. Data Collection Instruments

Three instruments were used. First, physics achievement tests were administered before and after the intervention. They included multiple-choice questions, short-answer questions, and problem-solving tasks concerning motion and force. Second, classroom observations examined participation, collaboration, interaction, and involvement in experimental activities. Third, students in the experimental group completed a questionnaire concerning motivation, interest, confidence, attitudes toward technology-based learning, and perceived usefulness.

3.5. Data Analysis

The collected data were analyzed comparatively. Pre-test and post-test mean scores were compared, and improvement was calculated as the change in mean

percentage score. Descriptive analysis was used to summarize the achievement results and questionnaire responses. Classroom observations were interpreted to identify differences in participation and engagement between the two groups.

3.6. Ethical Considerations

The study was conducted within the normal school learning process. Students' personal information was treated confidentially, and collected information was used for research purposes related to improving physics teaching and learning practices.

4. RESULTS

4.1. Academic Achievement

The pre-test results showed similar starting levels. The experimental group had a mean score of 62.4%, while the control group had a mean of 61.8%. After two months, the experimental group reached 86.7%, whereas the control group reached 72.5%. Thus, the change in the experimental group was +24.3 percentage points, compared with +10.7 percentage points in the control group.

Group	n	Pre-test mean (%)	Post-test mean (%)	Improvement (pp)
Experimental (PhET + AI)	30	62.4	86.7	+24.3
Control (traditional)	30	61.8	72.5	+10.7

The results show a larger observed increase in achievement for the experimental group. Because the study used a small quasi-experimental sample and descriptive analysis, the results should be interpreted as evidence within this research context rather than as a universal estimate of effect.

4.2. Conceptual Understanding

Students in the experimental group demonstrated stronger explanations of relationships among force, mass, and motion. By manipulating simulation parameters, learners could repeatedly observe cause-and-effect relationships and compare predictions with outcomes. The source article reports that this process

helped reduce common misconceptions related to force and movement and supported more accurate application of theoretical concepts to problem-solving.

4.3. Engagement and Motivation

Classroom observations indicated higher participation during simulation-based activities. The reported changes included increased participation in discussions, greater interest in virtual experiments, improved collaboration, greater confidence in explaining scientific concepts, and stronger motivation to solve physics problems. Students also reported that direct observation of variable changes made physics more understandable and interesting.

4.4. AI-Supported Learning

AI-supported activities contributed to faster feedback and individualized assistance. The reported functions included personalized explanations, identification of learning difficulties, support for independent learning, and more effective teacher monitoring of progress. According to the source article, teachers used learning information to adjust instructional strategies and provide additional support.

4.5. Student Feedback

Questionnaire statement	Agree (%)
PhET simulations helped me understand physics concepts better.	90
Interactive activities increased my interest in physics.	87
Virtual experiments helped me learn independently.	85
AI-based feedback supported my learning progress.	82
I would like to use interactive technologies in future lessons.	91

The questionnaire results show generally positive perceptions among students in the experimental group. The highest reported agreement concerned continued use of interactive technologies (91%), followed by improved understanding of physics concepts (90%).

5. DISCUSSION

The results indicate that the integrated instructional approach was associated with greater improvement in physics achievement than the traditional approach in this two-month study. The observed difference can be interpreted in relation to the learning functions provided by the technologies. PhET made relationships among physical variables visible and manipulable, while AI-supported activities supplied individualized feedback. *(Perkins et al., 2006, pp. 18–23; Wieman et al., 2008, pp. 682–683).*

The conceptual results are consistent with the inquiry-oriented nature of simulation learning. Instead of only receiving definitions and formulas, students could formulate predictions, manipulate variables, observe consequences, and construct explanations from evidence. This sequence creates more opportunities for active reasoning and may help learners connect mathematical representations with physical meaning. *(Perkins et al., 2006, pp. 18–23).*

The findings also emphasize the role of student-centered learning. During simulation activities, students were not limited to receiving information from the teacher; they investigated questions, discussed results, and collaborated with peers. Increased participation and motivation were observed alongside the improvement in test performance.

AI added a different form of support. Whereas simulation provided the experimental environment, AI-based feedback was intended to respond to individual difficulties. This is particularly relevant in mixed-ability classrooms. However, AI feedback should be monitored by teachers because automated explanations may require pedagogical checking and adaptation to curriculum goals.

Accessibility is another relevant consideration. Virtual simulations can provide experimental experiences where laboratory equipment is limited. Nevertheless, simulations should not automatically be treated as complete substitutes for physical experiments. Where real equipment is available and safe to use, combining physical experimentation with virtual investigation can provide complementary experiences. *(Finkelstein et al., 2005, pp. 010103-1–010103-10).*

The results should also be interpreted in light of the study's limitations. The sample consisted of 60 students from two classes, and the intervention lasted only two months. The design was quasi-experimental rather than a fully randomized controlled trial, and the analysis was primarily descriptive. Consequently, the findings provide context-specific evidence and do not by themselves establish long-term or universally generalizable effects.

Future studies should use larger samples, longer intervention periods, multiple schools, and additional statistical analyses. Further research could also examine separate contributions of PhET and AI, because the present design combines the two technologies in one experimental condition. Such research would help determine which learning mechanisms contribute most strongly to observed changes.

6. CONCLUSION

This study examined the use of PhET Interactive Simulations combined with Artificial Intelligence-supported learning in seventh-grade physics education. Within the two-month quasi-experimental context, students in the experimental group demonstrated a larger improvement in mean achievement than students in the control group, together with stronger reported conceptual understanding and engagement.

PhET supported visualization, manipulation of variables, virtual experimentation, and inquiry-based learning. AI-supported activities contributed personalized feedback, identification of learning difficulties, and support for teacher monitoring. Together, these functions created a learning environment that

was more interactive and individualized than the traditional approach used by the control group.

The findings support the use of PhET and AI as pedagogical tools for technology-enhanced physics instruction, while also emphasizing that technology does not replace the teacher. Effective implementation requires clear learning objectives, appropriate digital infrastructure, teacher preparation, careful task design, and responsible treatment of learner data.

Given the limited sample and duration, further research is needed before extending the findings to broader populations. Future investigations should examine long-term learning outcomes, different physics topics, different school contexts, and the individual contribution of simulation and AI components.

SOURCE-PAGE NOTE. The page numbers below refer to the printed page numbers of the cited original publications, not to the page numbers of this Word document. For the main PhET-related statements, the source is Perkins et al. (2006), pp. 18–23, and Wieman et al. (2008), pp. 682–683. For the AI-related general statements, Chen et al. (2020), pp. 75264–75278, was used. For the statement concerning simulation as a complement/substitute for physical laboratory equipment, Finkelstein et al. (2005), article pages 010103-1–010103-10, were used. The empirical results in Sections 3–4 (60 students, group means, questionnaire percentages) are the study data presented in the manuscript itself and are not taken from these external sources.

REFERENCES

1. Adams, W. K., Paulson, A., & Wieman, C. E. (2015). PhET Interactive Simulations: Transforming physics education through research-based design. University of Colorado Boulder.

2. Azevedo, R., & Gašević, D. (2019). Analyzing the effects of adaptive learning technologies in education. Computers & Education, 133, 1–5.

3. Baker, R. S., & Inventado, P. S. (2014). Educational data mining and learning analytics. In J. A. Larusson & B. White (Eds.), Learning Analytics: From Research to Practice (pp. 61–75). Springer.

4. Bond, M., Buntins, K., Bedenlier, S., Zawacki-Richter, O., & Kerres, M. (2020). Mapping research in student engagement and educational technology in higher education: A systematic evidence map. International Journal of Educational Technology in Higher Education, 17, 1–30.

5. Chiu, T. K. F., Moorhouse, B. L., Chai, C. S., & Ismailov, M. (2023). Teacher support and artificial intelligence in education: Opportunities and challenges. Education and Information Technologies, 28, 1–20.

6. Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial Intelligence in Education: Promises and Implications for Teaching and Learning. Center for Curriculum Redesign.

7. Hwang, G. J., Xie, H., Wah, B. W., & Gašević, D. (2020). Vision, challenges, roles and research issues of artificial intelligence in education. Computers and Education: Artificial Intelligence, 1, 100001.

8. Luckin, R. (2018). Machine Learning and Human Intelligence: The Future of Education for the 21st Century. UCL Institute of Education Press.

9. Mayer, R. E. (2021). Multimedia Learning (3rd ed.). Cambridge University Press.

10. Moore, E. B., Chamberlain, J. M., Parson, R., & Perkins, K. K. (2014). PhET interactive simulations: Transformative tools for teaching chemistry. Journal of Chemical Education, 91(8), 1191–1197.

11. OECD. (2023). Education at a Glance 2023: OECD Indicators. OECD Publishing.

12. Perkins, K., Adams, W., Dubson, M., Finkelstein, N., Reid, S., Wieman, C., & LeMaster, R. (2006). PhET: Interactive simulations for teaching and learning physics. The Physics Teacher, 44(1), 18–23. [cited pages: 18–23]

13. UNESCO. (2023). Guidance for Generative AI in Education and Research. UNESCO.

14. Wieman, C. E., Adams, W. K., & Perkins, K. K. (2008). PhET: Simulations that enhance learning. Science, 322(5902), 682–683. [cited pages: 682–683]

15. Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education. International Journal of Educational Technology in Higher Education, 16, Article 39.

16. Zheng, L., Niu, J., Zhong, L., & Gyasi, J. F. (2021). The effectiveness of artificial intelligence in education: A systematic review. Educational Technology Research and Development, 69, 1–20.

17. Bates, T. (2022). Teaching in a Digital Age: Guidelines for Designing Teaching and Learning. BCcampus.

18. Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. IEEE Access, 8, 75264–75278. [cited pages: 75264–75278]

19. Finkelstein, N. D., Adams, W. K., Keller, C. J., Kohl, P. B., Perkins, K. K., Podolefsky, N. S., Reid, S., & LeMaster, R. (2005). When learning about the real world is better done virtually: A study of substituting computer simulations for laboratory equipment. Physical Review Special Topics - Physics Education Research, 1(1), 010103. [cited article pages: 010103-1–010103-10]

20. González-Calatayud, V., Prendes-Espinosa, P., & Roig-Vila, R. (2021). Artificial intelligence for student assessment: A systematic review. Applied Sciences, 11(12), 5467.

21. Kizilcec, R. F., Pérez-Sanagustín, M., & Maldonado, J. J. (2017). Self-regulated learning strategies predict learner behavior and goal attainment in massive open online courses. Computers & Education, 104, 18–33.

22. Wang, Y., Liu, C., & Tu, Y. F. (2021). Factors affecting the adoption of AI-based educational technologies. Education and Information Technologies, 26, 1–20.

Source	Where used	Source pages
Perkins et al. (2006), PhET: Interactive Simulations for Teaching and Learning Physics	PhET, interactive exploration, visualization, inquiry, student engagement	18–23

Wieman, Adams & Perkins (2008), PhET: Simulations That Enhance Learning	Research-based value of PhET and conceptual learning through simulations	682–683
Chen, Chen & Lin (2020), Artificial Intelligence in Education: A Review	AI-supported learning, personalization, analytics and educational applications	75264–75278
Finkelstein et al. (2005), When learning about the real world is better done virtually	Simulation/virtual laboratory evidence and relation to physical laboratory work	010103-1–010103-10

3-SECTION

УДК 626/627

INNOVATIVE TECHNOLOGICAL SOLUTIONS FOR ENHANCING FOUNDATION RELIABILITY IN LOW-HEAD HYDRAULIC STRUCTURES

Nurekeshov Shuxrat Sapargali ugli

Doctoral Researcher, Scientific Research Institute of Irrigation and Water Problems

Mambetov Azamat Kuanishbay uli

Doctoral Researcher, Scientific Research Institute of Irrigation and Water Problems

Abstract. *Low-head hydraulic structures play a vital role in ensuring sustainable surface water management and supply across various economic sectors. During operation, structural damage and degradation of these facilities are driven by a complex interplay of objective environmental factors and subjective operational parameters. This paper analyzes the key failure mechanisms, highlights methodological deficiencies in current design codes, and outlines strategic interventions to enhance structural reliability.*

Keywords. *Low-head hydraulic structures, foundation soil, water resources, design methodology, construction, structural stability, operational safety.*

INTRODUCTION

Water scarcity across Central Asian nations is progressively escalating, exacerbating the region's economic and environmental challenges. Climate change induces unpredictable meteorological patterns that are projected to persist long-term. Over the coming decade, climate variability combined with increasing water consumption in neighboring states will reduce Uzbekistan's water intake from the Amudarya and Syrdarya river basins. Consequently, desertification and drought dynamics may intensify, posing severe risks to regional livelihoods and biodiversity. Implementing water-, energy-, and resource-saving technologies represents a primary strategic countermeasure to mitigate water deficits.

MAIN PART

Driven by rapid demographic growth, the national demand for water resources is rising steadily. Ensuring a reliable water supply for the population remains a paramount priority. Within this context, hydraulic structures (HS) serve as indispensable infrastructure for efficient water management across diverse economic sectors [1, 2].

Meeting these demands requires not only optimizing existing systems but also constructing new hydraulic facilities. However, engineers and planners face severe constraints due to the scarcity of topographically and geologically ideal construction sites, forcing new developments into complex geotechnical conditions.

In response to water deficits, recent years have seen increased emphasis on the design, construction, and operation of low-head hydraulic structures. In Uzbekistan, low-head structures far outnumber major dams. While leading researchers have contributed significantly to this field by developing analytical calculation methods and diagnostic software for fault detection, existing solutions often remain insufficient.

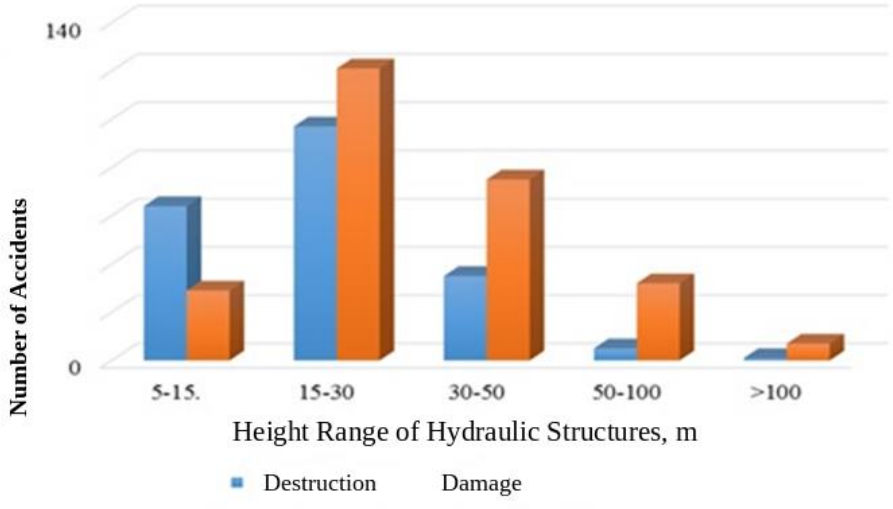
Primary limitations include:

- Difficulties in accurately modeling the soil-structure interaction (SSI) under complex engineering-geological conditions;
- A lack of specialized regulatory frameworks and design guidelines tailored specifically to low-head infrastructure;
- Insufficient empirical data regarding the long-term performance of novel construction types.

Consequently, developing resource-efficient foundation stabilization techniques and cost-effective design solutions for low-head hydraulic structures remains an urgent priority.

In 2023, an updated edition of the Law "On the Safety of Hydraulic Structures" was enacted to regulate technical monitoring and ensure the

operational safety of the nation's water assets [3]. A major challenge is that most low-head structures have been operating for over 40 years, experiencing cumulative structural degradation. Figure 1 illustrates the distribution of structural failure rates relative to dam height.



Timely repair, rehabilitation, and modernization using contemporary monitoring equipment are essential to maintain operational safety. Furthermore, directly extrapolating design principles established for high dams to low-head structures is a methodological error that leads to unjustifiably high capital expenditures. Addressing these issues requires specialized approaches to improve foundation strength, structural stability, and overall operational efficiency.

Failures in low-head structures stem from both objective and subjective factors. Objective causes encompass natural hazards such as intense precipitation, mudflows, landslides, and seismic events. Subjective factors include design miscalculations, non-compliance with technical regulations during construction, and improper operational procedures. Many structural defects are direct consequences of cost-cutting measures during preliminary geotechnical investigations or the use of substandard construction materials.

Despite advances in construction technology and material science, dam incidents continue to occur globally. Ensuring the long-term safety of both existing

and planned low-head hydraulic infrastructure necessitates leveraging both positive and negative international operational experiences [4, 5].

Moreover, material degradation and foundation weakening over time are inevitable processes. Key engineering properties—such as shear strength and impermeability—deteriorate under sustained environmental and hydrodynamic loads. Therefore, proactive maintenance, structural reinforcement, or the complete replacement of obsolete structures with modern, high-performance materials must be systematically planned.

CONCLUSION

The operational safety of low-head hydraulic structures demands immediate engineering interventions. Operating for over four decades without substantial reconstruction, many of these facilities represent high-risk infrastructure.

Based on comprehensive evaluations of foundation stability, hydrodynamic processes, and operational safety under Central Asian water scarcity conditions, the following key findings and recommendations are established:

1. **Infrastructure Degradation:** The majority of low-head hydraulic structures in Uzbekistan have exceeded 40 years of service life without major rehabilitation. Progressive degradation—driven primarily by mechanical suffosion, soil mass displacement, and material fatigue—places these facilities in a high-risk category requiring urgent technical remediation.

2. **Design Methodology Realignment:** Directly applying design criteria meant for high dams to low-head structures is methodologically flawed. This practice ignores the specific soil-structure interaction under localized geological conditions and leads to excessive capital costs. A dedicated, differentiated regulatory framework tailored specifically for low-head infrastructure must be established.

3. **Hydrodynamic and Cavitation Risks:** Operational analysis of pumping stations (e.g., the "Mash'al" station) reveals that water level drops in the forebay below critical thresholds (2.3 – 2.5 m) generate vortices, air entrainment, and severe cavitation. The collapse of cavitation bubbles induces severe hydrodynamic

shocks (up to several thousand atmospheres), high-frequency vibration (20 – 25 kHz), and accelerated hydro-abrasive erosion of impeller blades due to suspended sediment friction. Maintaining design water levels is essential to prevent cavitation damage.

4. **Strategic Recommendations:**

- Implement automated digital monitoring systems and IoT sensors for real-time tracking of soil displacement and hydraulic parameters, minimizing human error;
- Transition from quantitative flow control (throttling valves) to energy-efficient qualitative methods, specifically by integrating variable frequency drives (VFDs);
- Stabilize and reinforce dam foundations using modern geosynthetic and composite materials.

Adhering to these recommendations in alignment with the updated Law "On the Safety of Hydraulic Structures" will mitigate parametric failure risks, reduce maintenance costs, and ensure sustainable water management for the economy.

REFERENCES

1. Aitbaeva, F. R., Nurekeshov, Sh. S., & Paluanov, D. T. (2024). Criterion for ensuring the strength of the foundation of low-head hydraulic structures. *Problems of Architecture and Construction*, (1), 274–277.
2. Tlegenova, G. M., Nurekeshov, Sh. S., & Paluanov, D. T. (2024). Static analysis of the use of dams in ensuring water resources in the economic sector. *Proceedings of the International Scientific and Practical Conference "Conservation of Water Resources and Environmental Protection defined in the Uzbekistan-2030 Strategy"*, Samarkand, 100–106.
3. Law of the Republic of Uzbekistan "On the Safety of Hydraulic Structures". (2023). Tashkent.
4. Ablatova, A. M., & Paluanov, D. T. (2023). Rules for the use of low-head hydraulic structures. *Agro Processing*, 5(5), 32–35.
5. Paluanov, D. T. (2015). Investigation of soil mass displacement in the foundation of low-head dams. *Technical Science and Innovation (Vestnik TashGTU)*, (3), 257–261.

ANALYSIS OF MATHEMATICAL METHODS AND EXISTING APPROACHES FOR OPTIMIZING MINING-TECHNOLOGICAL PROCESS PARAMETERS USING HETEROGENEOUS SPATIO-TEMPORAL DATA

Abbosbek Abduvokhobov

National University of Uzbekistan named after Mirzo Ulugbek, Tashkent, Uzbekistan

e-mail: aabduvoxobov98@gmail.com

Abstract: *This paper presents a detailed analysis of mathematical optimization methods applied to mining-technological processes and of approaches for processing and integrating heterogeneous spatio-temporal data in industrial and geoscientific settings. Classical operations-research techniques, hybrid neural-network-based optimization schemes, geostatistical and machine-learning spatial-interpolation methods, numerical geomechanical modeling, and empirical drilling-and-blasting fragmentation models are examined in relation to one another. The analysis shows that these research directions have largely developed independently, and that no existing framework simultaneously integrates heterogeneous data fusion, physically grounded process modeling, and dedicated software support for mining-technological parameter optimization. This gap is used to justify the direction of the broader dissertation research.*

Keywords: *mining-technological processes; parameter optimization; heterogeneous data; spatio-temporal data fusion; geostatistics; kriging; geomechanical modeling; drilling and blasting; Kuz-Ram model; software systems*

INTRODUCTION

The efficiency of mining-technological processes - including drilling, blasting, excavation, and transport - depends on the timely optimization of numerous interrelated parameters described by data of fundamentally different nature: geological block models, real-time equipment telemetry, geomechanical monitoring records, and GIS layers. Such sources differ in format, sampling frequency, and resolution, and are commonly referred to as *heterogeneous spatio-temporal data* [4]. This paper analyzes four interrelated directions: (1)

mathematical optimization of mining-technological parameters; (2) processing and fusion of heterogeneous spatio-temporal data; (3) numerical and geostatistical modeling of the rock mass; and (4) empirical models of the drilling-and-blasting process, which forms the applied case study of the broader research this paper contributes to.

MAIN PART

1. Mathematical Optimization Methods in Mining-Technological Processes

Mathematical optimization has a long history of application to mining systems. Gorai and Chatterjee [1] provide a systematic treatment of linear and dynamic programming, network analysis, queuing theory, and non-linear optimization applied to mine planning and equipment reliability, confirming that classical operations-research techniques remain foundational even as computational capabilities expand. Song, Rinne, and van Wageningen [2] reviewed real-time optimization in underground mining production and found that its mine-wide application remained limited, largely because of the difficulty of integrating heterogeneous, dynamically changing production data into a single decision-support framework. Zhao, Xu, Li, and Pan [3] proposed a hybrid artificial neural network and genetic algorithm strategy to optimize process-control parameters of a fully mechanized coal mining face, reporting improved accuracy compared with experience-based manual adjustment. These studies indicate a clear trajectory from purely analytical models toward hybrid schemes combining mathematical programming with machine-learning components.

2. Heterogeneous Spatio-Temporal Data Processing and Fusion

Sun and Ren [4] proposed a multi-source heterogeneous data-fusion method for Internet-of-Things-based intelligent systems, using a mixed information-gain strategy to evaluate correlations between dissimilar data types prior to fusion, with results showing substantial gains over conventional techniques. Although developed outside the mining domain, the underlying challenge - reconciling spatially referenced, asynchronously sampled data of differing resolution - is

structurally identical to that faced in mining data environments. Within mining specifically, the classical approach is geostatistical interpolation (kriging), originally developed by D. G. Krige for gold-grade estimation. Maniteja et al. [5] compared ordinary kriging with several machine-learning regression methods for iron-ore grade estimation, finding comparable but not consistently superior accuracy for machine learning ($R^2 \approx 0.73–0.74$), suggesting that fusion methods should be benchmarked against established geostatistical baselines rather than assumed superior.

3. Numerical and Geomechanical Modeling of the Rock Mass

Because the physical state of the rock mass constrains which parameters are feasible or safe, numerical geomechanical modeling forms a third essential direction. Teng, He, Wang, Sun, and Yan [6] applied a synthetic rock mass approach, combining a discrete fracture network with the distinct element method and a strength-reduction technique to assess open-pit slope stability, validating results against limit-equilibrium and finite-element benchmarks. Such studies confirm that realistic process modeling depends on integrating multiple heterogeneous data types - discontinuity geometry, rock properties, and in situ stress.

4. Drilling-and-Blasting Fragmentation Modeling

Kuznetsov [7] first established the empirical relationship between mean fragment size, powder factor, and rock properties, an equation later incorporated, together with the Rosin–Rammler distribution, into the widely used Kuz-Ram model. Morin and Ficarazzo [8] embedded this model within a Monte Carlo simulation framework to propagate rock-mass and explosive-property variability, achieving favorable agreement with quarry field data. Gheibie, Aghababaei, Hoseinie, and Pourrahimian [9] proposed a modified Kuz-Ram formulation calibrated for the Sungun copper mine, showing that site-specific calibration substantially improves accuracy. These studies show that, while Kuz-Ram-type models provide a robust empirical basis for blast-design optimization, their

accuracy is highly sensitive to local conditions and requires calibration using data that is itself heterogeneous in origin.

DISCUSSION AND CONCLUSION

Synthesizing the four directions reviewed reveals a consistent pattern: optimization methods [1–3] are well developed for individual sub-processes but rarely treat data as explicitly heterogeneous; fusion and interpolation methods [4, 5] offer rigorous techniques for multi-source data but are rarely coupled with mining-specific physical models; and geomechanical and fragmentation models [6–9] are physically grounded yet applied in isolation from broader data-integration considerations. This gap - the absence of a framework that simultaneously processes heterogeneous spatio-temporal mining data, embeds it within physically grounded process models, and exposes the resulting optimization through dedicated software - constitutes an unresolved and practically significant research problem. Future work should focus on developing mathematical models that integrate heterogeneous spatio-temporal data with physically grounded mining process models, together with software implementations validated on real production data.

REFERENCES

1. Gorai, A. K., & Chatterjee, S. (2022). Optimization techniques and their applications to mine systems. CRC Press.

2. Song, Z., Rinne, M., & van Wageningen, A. (2013). A review of real-time optimization in underground mining production. Journal of the Southern African Institute of Mining and Metallurgy, 113(12), 889–897.

3. Zhao, H., Xu, Z., Li, Q., & Pan, T. (2021). Optimization of process control parameters for fully mechanized mining face based on ANN and GA. Computational Intelligence and Neuroscience, 2021, Article 5557831. https://doi.org/10.1155/2021/5557831

4. Sun, R., & Ren, Y. (2024). A multi-source heterogeneous data fusion method for intelligent systems in the Internet of Things. Intelligent Systems with Applications, 23, Article 200424. https://doi.org/10.1016/j.iswa.2024.200424

5. Maniteja, M., Samanta, G., Gebretsadik, A., Tsae, N. B., Rai, S. S., Fissha, Y., Okada, N., & Kawamura, Y. (2025). Advancing iron ore grade estimation: A comparative study of machine learning and ordinary kriging. Minerals, 15(2), Article 131. https://doi.org/10.3390/min15020131

6. Teng, L., He, Y., Wang, Y., Sun, C., & Yan, J. (2024). Numerical stability assessment of a mining slope using the synthetic rock mass modeling approach and strength reduction

technique. Frontiers in Earth Science, 12, Article 1438277. https://doi.org/10.3389/feart.2024.1438277

7. Kuznetsov, V. M. (1973). The mean diameter of the fragments formed by blasting rock. Soviet Mining Science, 9(2), 144–148. https://doi.org/10.1007/BF02506177

8. Morin, M. A., & Ficarazzo, F. (2006). Monte Carlo simulation as a tool to predict blasting fragmentation based on the Kuz-Ram model. Computers & Geosciences, 32(3), 352–359. https://doi.org/10.1016/j.cageo.2005.06.022

9. Gheibie, S., Aghababaei, H., Hoseinie, S. H., & Pourrahimian, Y. (2009). Modified Kuz-Ram fragmentation model and its use at the Sungun copper mine. International Journal of Rock Mechanics and Mining Sciences, 46(6), 967–973. https://doi.org/10.1016/j.ijrmms.2009.05.003

TALABALARNI MUHANDISLIK KASBIY FAOLIYATIGA TAYYORLASHDA INTERFAOL METODLARNING ROLI

Eshquvvatov Ulug‘bek Abdulla o‘g‘li

Termiz davlat muhandislik va agrotexnologiyalar universiteti

“Yo‘l muhandisligi” kafedrasi dotsenti

E-mail:eshkuvvatov.ulugbek@mail.ru.

ORCID ***0000-0002-6129-2583***

Annotasiya*. Maqolada texnik oliy ta’lim muassasalarida talabalarni muhandislik kasbiy faoliyatiga tayyorlashda kreativ qobiliyatlarini rivojlantirishning tashkiliy metodik modeli ishlab chiqilgan va uning asosiy qoidalari mazmun – mohiyati yoritib berilgan.*

Kalit so‘zlar va tushunchalar: *talaba, ta’lim, tarbiya, muhandis, interfaol, metod, ijod, qobiliyat, model, o‘quv jarayoni, qiziqish, ko‘nikma, malaka, kasb, samaradolik.*

Аннотация. *В статье разработана организационно-методическая модель развития творческих способностей студентов технических вузов при подготовке к инженерной профессиональной деятельности, раскрыты ее основные положения и сущность.*

Ключевые слова и понятия: *студент, образование, воспитание, инженер, интерактивный, метод, творчество, способность, модель, учебный процесс, интерес, навык, умение, профессия, эффективность.*

Abstract. *student, education, upbringing, engineer, interactive, method, creativity, ability, model, learning process, interest, skill, qualification, profession, effectiveness.*

Keywords and concepts: *student, education, upbringing, engineer, creativity, ability, model, learning process, interest, skill, qualification, profession, effectiveness.*

KIRISH

O’zbekiston Respublikasini yanada rivojlantirish bo’yicha harakatlar strategiyasida “Uzluksiz ta’lim tizimini yanada takomillashtirish, sifatli ta’lim xizmatlari imkoniyatlarini oshirish, mehnat bozorining zamonaviy ehtiyojlariga mos yuqori malakali kadrlar tayyorlash siyosatini davom ettirish” kabi muhim vazifalar belgilandi. Fan va texnika yutuqlari, ishlab chiqarish va xizmati

ko‘rsatish soxalarida kognitiv va nomoddiy omillar roli oshishi texnik oliy ta’lim muassasalarida bo‘lajak kadrlarni tayyorlashga yangicha yondashuv bo‘lishini talab etadi. Tadqiqotlarga ko‘ra [1] shaxsiy qobiliyatni rivojlantirishning extiyoj katta sifati bu – ijodiy rivojlanish va ijodiy yechim qabul qilishga tayyorlik qobiliyati ekan. Shuning uchun talabalarning faqatgina intellektual rivojlanishigina emas balki ijodiy qobiliyatlarini ham rivojlantirish talab qilinadi.

ASOSIY QISM

An’anaviy didaktik o‘qitish metodikasidan farqli ravishda interfaol ta’limda asosiy etibor dialog kontsepsiyasi asosida qurilib, tushunish va o‘zaro tushunishga asoslangan. Boshqacha aytganda interfaol metodikada ta’lim olayotgan muhandis talaba o‘zaro hamkorlik jarayonida yoki suxbatda bo‘ladi, bu esa ta’lim oluvchining intellektual va ijodiy qobiliyatlarini ochilishini, o‘z ustida ishlashini ta’minlab, ixtiro va kashfiyot qilishga yo‘naltirilgan kreativ qobiliyatini rivojlantirishiga olib keladi.

Ta’lim jarayoninini o‘rganish shuni ko‘rsatdiki, o‘quv darslari ko‘pincha akademik rejimda olib boriladi. Muxandis talaba kreativ qobiliyatini ochuvchi interfaol metodikadan foydalanilmaydi yoki juda oz miqdorda foydalaniladi.

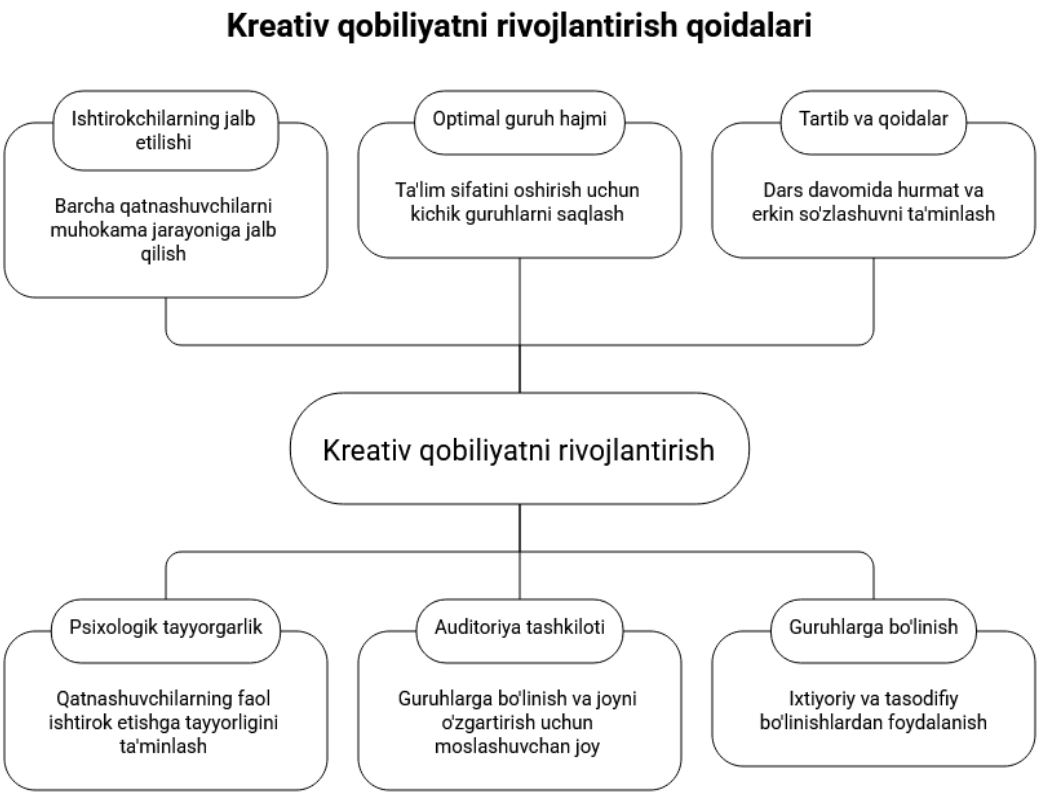
Ushbu ish oldiga qo‘yilgan muammo va maqsadidan kelib chiqib quyidagi vazifalar shakllantirildi:

1. Texnik oliy ta’lim muassasalarida talabalar kreativ qobiliyatini rivojlantirish mohiyati, tuzilishi va mezonlari.

2. Texnik oliy ta’lim muassasalarida muhandis talabalarning kreativlik qobiliyatlarini rivojlantirishda interfaol usullarni joriy etishning asosiy qoidalarini ishlab chiqish.

3. Texnik oliy ta’lim muassasalarida talabalari kreativlik qobiliyati rivojlanish pedagogik – psixologik sharoitlarini o‘rganish.

4. Muhandislarni tayyorlash jarayonida talabalarning kreativlik qobiliyatlarini rivojlantirishning tashkiliy-metodik modelini ishlab chiqish.



1-rasm. Talabalarda kreativ qobilyatni rivojlantirish modeli

Kreativ qobiliyat strukturasi bo‘yicha olimlar tomonidan turli fikrlar bildirilgan. T.B. Shiloning takidlashiga ko‘ra, kreativlik – fikrlashning kognitiv-intellektual ijodiy omili (tezkorlik, egiluvchanlik, originallik, ishlab chiqilganlik) va shaxsning individual omili (tavakkalchilik, murakkablik, qiziquvchanlik, tasavvurga egalik) tashkil etadi. Umumiy qilib kreativlik strukturasi motivasion, samarador, intellektual, estetik, ekzistentsial, kirishuvchanlik, kompetentlik kabi kreativ sifatlarning o‘ziga xos va noyob birlashmasidir [3].

Asosiy vazifalar: bir kurs davomida o‘rta umumta’lim maktablarida olingan bilimlarni mustaxkamlash; ta’lim oluvchilarda motivasiya muxitini rivojlantirish; guruxlarda umumiy ijobiy psixologik iqlim yaratish; gurux talabalari hamda pedagog va talaba o‘rtasida erkin fikrini bildirish muhitini yaratish.

Tadqiqotlarimiz natijasida biz oliy ta’lim muassasalaridagi talabalarda kreativ qobiliyatni rivojlantirishni tashkiliy metodik modelini ishlab chiqdik. Ushbu taklif etilayotgan modelning afzalliklari quyidagicha aniqlandi:

1. Talabaning ta’lim olish jarayonini faollashtiradi, chunki ta’lim berishning interfaol metodlari ta’lim oluvchilar o‘quv faoliyatini motivasiyalaydi;

2. Do‘stona pedagogik mikroiqlimini yaratadi, bu o‘z navbatida erkin bo‘lish, intuisiya va tasavvurdan foydalanish sharoitini hosil qiladi;

3. Shaxslararo munosabatni yaratadi, kasbiy faoliyatda yoki xayotda duch kelishi mumkin bo‘lgan muammoli holatlarni modellashtirish orqali jamoaviy qaror qabul qilishga o‘rgatadi;

4. O‘quv materialini muammodorligi, qiyinchiligi va murakkabligini keng doirada rostlash imkonini beradi;

5. Ta’lim olish va o‘qitish usullari va metodlarini egiluvchan birlashtirish imkonini beradi;

6. Muhandislik kasbiy faoliyatni modellashtiradi;

7. O‘qitishning interfaol metodlari talabalar ijodiy madaniyatini rivojlantirish fenomeni sifatida qo‘llaniladi, chunki talabalarda kreativ qobiliyatini rivojlantirishni kengaytiruvchi va chuqurlashtiruvchi vazifani bajaradi.

XULOSA

Xulosa qilib aytganimizda, talaba o‘quv jarayonining to‘la huquqli qatnashuvchisiga aylanadi, uning muhandislik tayyorgarlik jarayonida kasbiy faoliyatiga bo‘lgan tajribasi bilim olish asosiy manbasiga aylanadi. Yuqorida biz ishlab chiqgan modeldan korinadiki pedagog tayyor bilim bermaydi, lekin qatnashuvchilarni mustaqil izlanishga undaydi va topshiriqni bajarishda yordamchi funktsiyasini bajaradi.

FOYDALANILGAN ADABIYOTLAR

1. Musurmanova O. Kreativlik – pedagog kadrlar kompetentligini belgilovchi muhim indikator sifatida. Oliy ta’lim: muammo va echimlar respublika ilmiy-amaliy konferentsiyasi ilmiy maqola va tezislar to‘plami (2020 yil 25 may) 27-32 betlar.

2. Avazboyev A. I., Pardaboyev J. E. talabalar ijodkor sifatlarini rivojlantirishning samarali yo‘llari. Oliy ta’lim / oliy ta’lim jurnali. 20-25 betlar.

3. Шило Т.Б. Структура креативности: современные взгляды на проблему. Тенденции развития психологии, педагогики и образования/Сборник научных трудов по итогам международной научно-практической конференции. Казань, 2014.

4. Махмутов, М. И., Ибрагимов, Г. И., & Чошанов, М. А. Педагогические технологии развития мышления учащихся. *Казань: ТГЖИ*,- (1993). С.*88*.

5. Шарипов Ш.С. Талабалар ихтирочилигини шаклланти-ришнинг педагогик шароитлари: Дисс. ... пед. фан. номз. – Т.,2001. – Б.140

6. Eshquvvatov U.A., Talabalarning muhandislik kasbiga oid ijodiy qobiliyatlarini rivojlantirishning didaktik talablari va shartlari. Ta’lim va innovatsion taqiqotlar jurnali 377-380 betlar.

UDC: 626.82:627.824:624.131.5

STABILIZATION AND SAFETY CRITERIA FOR LOW-HEAD HYDRAULIC STRUCTURES ON DEFORMABLE FOUNDATIONS

Kadirov Javakhir Yaxshimuratovich

Doctoral student at the Research Institute of Irrigation and Water Problems of Tashkent

e-mail: kadirovjavohir59@gmail.com

Kdirniyazova Zulxumar Polatovna

Nukus State Pedagogical Institute named after Ajiniyaz, Manager of the Registrar Office Department

e-mail: zkdirniyazova98@gmail.com

Abstract. *This paper investigates the operational stability of Class III and IV low-head hydraulic structures and earth dikes operating under the challenging geotechnical conditions of the Aral Sea basin, specifically within the Mezhdurechye reservoir and the artificial lake systems of the Amudarya River delta. In-situ investigations and analytical calculations were performed to evaluate the rewetting behavior, internal suffosion, and differential settlements of the water-saturated silty sand and sandy loam foundation layers. Rather than utilizing heavy grouting and cementation techniques, an environmentally and economically efficient structural approach was developed based on the integration of polymer nanocomposites (HDPE geomembrane and geotextile), multilayer granulometric inverted filters, and flexible gabion mattresses. The experimental and numerical modeling results demonstrated that this proposed technology reduces the exit seepage gradient to J_{out} = 0.11 increases the slope stability factor of safety to k_{st} = 1.38, and extends the incident-free service life of these structures by an additional 20–25 years.*

Keywords: *Amudarya delta, Mezhdurechye reservoir, Class III–IV structures, protective dike, deformable foundation, mechanical suffosion, critical hydraulic gradient, HDPE geomembrane, inverted filter, gabion mattress.*

INTRODUCTION

The desiccation of the Aral Sea has led to severe ecological, hydrological, and hydrogeological alterations in the lower reaches and deltaic regions of the Amudarya River. Drastic reductions in river discharge along with seasonal runoff imbalances necessitated the construction of an interconnected system of artificial wetlands and lakes (Muynak, Rybachye, Zhyltyrbas), governed by the Mezhdurechye reservoir. The primary hydraulic infrastructure supporting this system comprises Class III and IV low-head facilities—such as water distributors, regulators, spillways, pumping station intakes, and protective earthen dikes spanning over 150 kilometers. Currently, over 75% of these facilities have been in continuous operation for more than 40 years. Law of the Republic of Uzbekistan No. ZRU-865 of August 30, 2023, "On the Safety of Hydraulic Structures," establishes that regular technical monitoring and the guarantee of operational safety are top national priorities—even for low-head hydraulic facilities. However, design interventions originally developed for major Class I and II dams are prohibitively expensive and technically impractical for smaller facilities, underscoring the urgent need for simpler, cost-effective, and dependable localized engineering solutions. The foundation strata across the Amudarya delta predominantly consist of fine silty sands, sandy loams, and organic alluvial silts, which are classified geotechnically as "deformable foundations". During flood periods, strong hydrodynamic seepage flows develop beneath the structures and within the dike embankments, triggering grain migration (mechanical suffosion) and non-uniform ground settlement. Consequently, developing stabilization techniques using deformation-tolerant polymeric geomembranes, inverted filters, and gabion mattresses—without relying on heavy drilling and chemical grouting—is of vital scientific and engineering importance.

Research methodology and computational models

This research utilizes field monitoring data from the Mezhdurechye reservoir hydro-complex and dikes, combined with fundamental soil mechanics and limit-state design principles for hydraulic structures.

Seepage flow modeling

Pressurized and unconfined steady-state seepage flow through the embankment body and its anisotropic foundation was formulated using the two-dimensional Laplace differential equation: [7]:

$$k_x \frac{\partial^2 H}{\partial x^2} + k_z \frac{\partial^2 H}{\partial z^2} = 0$$

where:

k_x, k_z - are the hydraulic conductivity coefficients in the horizontal and vertical directions, respectively (m/day);

H - is the total piezometric head function.

Suffosion Stability and Critical Hydraulic Gradient. The resistance of the deltaic silty-sandy soils to internal mechanical suffosion was evaluated by comparing the actual exit seepage gradient (J_{out}) with the critical hydraulic gradient (J_{cr}) [6]:

$$J_{cr} = (1 - n)\frac{\rho_s - \rho_w}{\rho_w} \cdot \beta$$

$$J_{out} = \frac{\Delta h}{\Delta l} \leq \frac{J_{cr}}{K_s}$$

where:

- n— is the soil porosity;
- ρ_s — is the soil grain density (averaging 2.65–2.68 g/cm^3);
- ρ_w — is the density of water (1.0 g/cm^3);
- β — is an empirical coefficient accounting for the quicksand/fluidity characteristics of silty sands (β = 0.70 - 0.78);
- K_s — is the required factor of safety ($K_s \geq 125$).

Slope Stability Analysis. The slope stability factor of safety (k_{st}) was determined using the Bishop simplified circular-cylindrical slip surface method, incorporating seepage body forces and pore water pressures [4]:

$$k_{st} = \frac{\sum[c_i' b_i + (W_i - u_i b_i)\tan\varphi_i'] \frac{1}{\cos\alpha_i(1 + \tan\alpha_i \tan\varphi_i'/k_{st})}}{\sum W_i \sin\alpha_i}$$

where: c_i', φ_i' — are the effective cohesion and internal friction angle of the soil; W_i — is the total slice weight; u_i — is the pore water pressure acting along the slice base; b_i — is the slice width; α_i — is the inclination angle of the slice base relative to the horizontal.

Results and discussion

In-situ geotechnical investigations of the hydraulic structures and distribution canals of the Mezhdurechye reservoir revealed critical adverse subsoil properties:

- High natural moisture content: W = 21 – 27 %, with a high degree of water saturation: S_r = 0.82 - 0.90;
- Extremely low deformation modulus: E = 6.2 - 8.5 МПа;
- Sharp reduction in internal friction angle upon saturation: $\varphi = 17° - 21°$;
- Poor gradation uniformity of fine sands, rendering them exceptionally susceptible to suffosion ($d_{60}/d_{10} > 12$).

During high-water seasons, the actual exit seepage gradient behind the downstream aprons reached J_{out} = 0.28 - 0.33, exceeding the computed critical threshold (J_{cr} = 0.21). As a consequence, fine sand particles were actively washed out, forming subsurface piping cavities and causing differential settlements up to 30–45 mm.

Proposed Engineering Solution and Technology:

1. **Upstream HDPE Geomembrane Impervious Barrier:** A 1.5 mm thick high-density polyethylene (HDPE) geomembrane is installed along the upstream slope and the foundation heel of the water distributor. To protect against mechanical puncture and wear, it is encapsulated on both sides with 350 g/m^2 thermally bonded non-woven geotextile and keyed into the underlying impervious layer via an anchor trench.

2. **Multilayer Granulometric Inverted Filter (Downstream):** A three-stage reverse filter prism is constructed at downstream seepage exit zones to arrest particle migration: [7]:

- Base layer: coarse sand mixed with fine gravel (d = 1 - 3 mm, thickness 20 cm);
- Intermediate layer: fine crushed stone (d = 5 - 20 mm, thickness 25 cm);
- Top surcharge layer: coarse rock riprap (d = 40 - 70 mm, thickness 30 cm).

3. **Flexible Gabion and Reno Mattresses for Bank Protection:** A 0.5 m thick system of zinc- and polymer-coated woven wire mesh gabions filled with rock is placed across downstream aprons and bank slopes vulnerable to dynamic scour. This arrangement dissipates hydraulic energy, relieves seepage pressure, and conforms flexibly to differential settlement without structural collapse.

Performance Comparison Before and After Implementation:

Parameter	Baseline / Damaged State	After Proposed Technology	Dynamic Change
Exit seepage gradient (J_{out})	0.31	0.11	Reduced 2.8 times ($J_{out} < J_{cr}$)
Specific seepage discharge through dike (q), m³/day·m	2.45	0.85	Decreased by 65.3%
Slope stability factor of safety (k_{st})	1.14 (hazardous)	1.38 (meets regulatory standard)	Increased by 21.0%
Suffosion turbidity concentration (S_m), g/l	0.24	0.008	Suffosion fully halted
Relative differential settlement ($\Delta S/L$)	0.0041	0.0016	Reduced by 61.0%

The installation of the geomembrane barrier suppressed the phreatic surface and eliminated excess pore water pressure within the embankment. Concurrently, the coupled inverted filter and flexible gabion mattress eliminated particle wash-out and internal piping failure [10].

CONCLUSION

1. The primary cause of structural damage and failures in Class III and IV hydraulic facilities and dikes within the Amudarya delta is the severe vulnerability of water-saturated silty sand and loam foundations to internal piping suffosion, caused by exit gradients exceeding critical limits ($J_{out} > 0.28$).

2. Combining polymeric geomembranes, protective geotextiles, multi-stage granulometric inverted filters, and rock-filled gabion structures provides high technical and economic efficiency for stabilizing low-head structures on deformable alluvial soils.

3. The proposed integrated technology lowers seepage discharge by 65%, brings exit gradients to safe design limits ($J_{out} = 0.11$), and extends the safe operational life of these hydraulic structures by an additional 20–25 years.

REFERENCES

1. Law of the Republic of Uzbekistan. *On the Safety of Hydraulic Structures* (No. ZRU-865, August 30, 2023). — Tashkent, 2023. — URL: https://lex.uz/docs/6589332

2. Bazarov, D.R., Mallaev, Sh.S. *Reliability and Safety of Low-Head Hydraulic Structures under Complex Ground Conditions*. — Tashkent: Fan va texnologiya, 2021. — 210 p. — URL: https://tiiame.uz/uz/page/science-monographs

3. Mirsaidov, M.M., Sultanov, T.Z. Dynamic behavior and assessment of safety of earth dams. *Magazine of Civil Engineering*, 2021, no. 4(104), p. 10408. — DOI: https://doi.org/10.34910/MCE.104.8

4. KMK 2.06.03-97. *Foundations of Hydraulic Structures (Design Codes)*. — Tashkent: State Committee for Architecture and Construction of the Republic of Uzbekistan, 1997. — 74 p. — URL: https://mc.uz/en/normative-documents

5. ICOLD (International Commission on Large Dams). *Small Dams: Design, Surveillance and Rehabilitation*. Bulletin 157. — Paris: ICOLD, 2018. — 145 p. — URL: https://www.icold-cigb.org/GB/publications/bulletins.asp

6. Terzaghi, K., Peck, R.B., Mesri, G. *Soil Mechanics in Engineering Practice*. 3rd ed. — New York: John Wiley & Sons, 1996. — 592 p. — ISBN: 978-0471086581. — URL: https://www.wiley.com/en-us/Soil+Mechanics+in+Engineering+Practice%2C+3rd+Edition-p-9780471086581

7. Cedergren, H.R. *Seepage, Drainage, and Flow Nets*. 3rd ed. — New York: John Wiley & Sons, 1997. — 496 p. — DOI: https://doi.org/10.1002/9780470172780

8. Koerner, R.M. *Designing with Geosynthetics*. 6th ed. — Xlibris Publishing, 2012. — Vol. 1. — 508 p. — ISBN: 978-1462882885. — URL: https://www.geosynthetic-institute.org/books.htm

9. Agostini, R., Conte, A., Malaguti, L., Papetti, A. *Flexible Gabion and Reno Mattress Structures in River and Stream Training Works*. — Bologna: Officine Maccaferri S.p.A., 2015. — 120 p. — URL: https://www.maccaferri.com/technical-library/

10. Mitchell, J.K., Santamarina, J.C. Impermeabilization and ground improvement in hydraulic structures. *Journal of Geotechnical and Geoenvironmental Engineering, ASCE*, 2022, vol. 148, iss. 5, pp. 04022018. — DOI: https://doi.org/10.1061/(ASCE)GT.1943-5606.0002781

“TIKUVCHILIK SOHASIDA ZAMONAVIY KASBIY KOMPETENSIYALARNI SHAKLLANTIRISH: TA’LIM VA MEHNAT BOZORI INTEGRATSIYASI”

Jo‘rayeva Sanobar Toshtemirovna

Jizzax viloyati Zarbdor tumani

2-sonli texnikum ishlab chiqarish ustasi

Annotatsiya: *Mazkur maqolada tikuvchilik sohasida zamonaviy kasbiy kompetensiyalarni shakllantirishning dolzarb masalalari hamda ularni kasbiy ta’lim jarayonida rivojlantirish imkoniyatlari yoritilgan. Bugungi kunda mehnat bozorida raqobatbardosh, zamonaviy texnologiyalarni puxta egallagan va amaliy ko‘nikmalarga ega mutaxassislarga bo‘lgan talab ortib bormoqda. Shu nuqtayi nazardan, tikuvchilik yo‘nalishida ta’lim mazmunini ishlab chiqarish talablari bilan uyg‘unlashtirish, o‘quvchilarda kasbiy, texnologik, kreativ va tadbirkorlik kompetensiyalarini rivojlantirish muhim ahamiyat kasb etadi. Maqolada tikuvchilik ta’limida innovatsion texnologiyalardan foydalanish, amaliy mashg‘ulotlarning samaradorligini oshirish, ta’lim muassasalari va ish beruvchilar o‘rtasidagi hamkorlikni kuchaytirish masalalari tahlil qilinadi. Shuningdek, kasbiy ta’limni mehnat bozori ehtiyojlari asosida takomillashtirish orqali zamonaviy va malakali tikuvchilik mutaxassislarini tayyorlash istiqbollari ko‘rib chiqiladi.*

Kalit so‘zlar: *tikuvchilik, kasbiy ta’lim, kasbiy kompetensiya, mehnat bozori, zamonaviy texnologiyalar, innovatsion ta’lim, amaliy ko‘nikma, malakali mutaxassis, tadbirkorlik kompetensiyasi, ta’lim integratsiyasi.*

ABSTRACT

This article examines the aкmyal issues of developing modern professional competencies in the field of sewing and the opportunities for their formation within vocational education. Today, the labor market is increasingly demanding competitive specialists who possess practical skills and are proficient in modern technologies. In this regard, it is important to align the content of vocational education in sewing with the requirements of production and to develop students’ professional, technological, creative, and entrepreneurial competencies. The article analyzes the use of innovative technologies in sewing education, ways to improve the effectiveness of practical training, and the importance of strengthening cooperation between educational institutions and employers. In addition, the prospects for training qualified and

modern sewing specialists through the improvement of vocational education based on labor market requirements are considered.

Keywords: *sewing, vocational education, professional competence, labor market, modern technologies, innovative education, practical skills, qualified specialist, entrepreneurial competence, educational integration.*

KIRISH

Bugungi kunda jahon iqtisodiyotida yuz berayotgan texnologik o‘zgarishlar, ishlab chiqarish jarayonlarining modernizatsiyalashuvi hamda mehnat bozorida yangi kasbiy talablarning shakllanishi kasbiy ta’lim tizimini takomillashtirishni taqozo etmoqda. Ayniqsa, yengil sanoatning muhim tarkibiy qismi bo‘lgan tikuvchilik sohasida zamonaviy texnologiyalarni egallagan, ijodiy fikrlaydigan, amaliy ko‘nikmalarga ega va bozor talablariga moslasha oladigan malakali mutaxassislarni tayyorlash dolzarb masalalardan biri hisoblanadi. Shu jihatdan kasbiy ta’limni faqat nazariy bilim beruvchi tizim sifatida emas, balki shaxsning muayyan kasbni egallashi, amaliy faoliyatga tayyorlanishi va mehnat bozorida mustaqil faoliyat yuritishi uchun zarur kompetensiyalarni shakllantiruvchi muhim ijtimoiy institut sifatida qarash zarur. O‘zbekiston Respublikasida ta’lim tizimini, xususan, kasbiy ta’limni rivojlantirish davlat siyosatining ustuvor yo‘nalishlaridan biri sifatida belgilanmoqda. O‘zbekiston Respublikasining **2020-yil 23-sentabrdagi O‘RQ-637-son “Ta’lim to‘g‘risida”gi Qonuni** ta’lim sohasidagi munosabatlarni huquqiy jihatdan tartibga soluvchi asosiy hujjatlardan biri bo‘lib, unda ta’limning uzluksizligi, ta’lim olish shakllarining xilma-xilligi, ta’lim va tarbiyaning insonparvarlik hamda demokratik xususiyati kabi muhim tamoyillar belgilangan. Mazkur qonun kasbiy ta’limni zamonaviy talablar asosida tashkil etish, ta’lim oluvchilarning bilim, ko‘nikma va malakalarini rivojlantirish uchun huquqiy asos yaratadi.

Kasbiy ta’limni mehnat bozori ehtiyojlari bilan uyg‘unlashtirish masalasi O‘zbekiston Respublikasi Prezidentining **2019-yil 6-sentabrdagi PF-5812-son “Professional ta’lim tizimini yanada takomillashtirishga doir qo‘shimcha chora-tadbirlar to‘g‘risida”gi Farmoni**da ham alohida ahamiyat kasb etadi.

Mazkur hujjatda mehnat bozori talablariga mos yuqori malakali kadrlar tayyorlash, ta’lim sifatini oshirish, xalqaro standartlarni joriy etish hamda innovatsion yutuqlarni amaliyotga tatbiq etish kabi vazifalar ilgari surilgan. Ushbu yondashuv tikuvchilik kabi amaliy kasblar uchun ayniqsa muhim bo‘lib, ta’lim jarayonida o‘quvchilarning faqat nazariy bilimlarini emas, balki real ishlab chiqarish sharoitida qo‘llay oladigan kasbiy kompetensiyalarini shakllantirishni talab etadi. Professional ta’lim tizimini tartibga solishning keyingi bosqichlarida ham ta’lim va ishlab chiqarish o‘rtasidagi aloqalarni kuchaytirishga e’tibor qaratildi. Xususan, Vazirlar Mahkamasining **2020-yil 7-avgustdagi 466-son qarori** bilan O‘zbekistonda uzluksiz boshlang‘ich, o‘rta va o‘rta maxsus professional ta’lim tizimini tartibga soluvchi normativ-huquqiy hujjatlar tasdiqlangan. Shuningdek, professional ta’lim tizimida **dual ta’limni tashkil etish** bo‘yicha 2021-yil 29-martdagi 163-son qarorning qabul qilinishi ta’lim oluvchilarning nazariy bilimlarini amaliy faoliyat bilan uyg‘unlashtirish imkoniyatlarini kengaytirdi. Mazkur normativ-huquqiy asoslar tikuvchilik ta’limini tashkil etishda ham muhim metodologik ahamiyatga ega. Chunki tikuvchilik kasbi o‘z mohiyatiga ko‘ra bevosita amaliy faoliyat bilan bog‘liq bo‘lib, unda o‘quvchidan bichish, tikish, texnologik jarayonlarni to‘g‘ri tashkil etish, tikuv mashinalari va boshqa jihozlardan foydalanish, kiyim konstruksiyasini ishlab chiqish, material xususiyatlarini hisobga olish, dizayn va estetik talablarni uyg‘unlashtirish kabi ko‘plab ko‘nikmalar talab etiladi. Zamonaviy ishlab chiqarish sharoitida esa ushbu ko‘nikmalarning o‘zi yetarli bo‘lmay, raqamli texnologiyalardan foydalanish, yangi materiallar bilan ishlash, mahsulot sifatini nazorat qilish, mijoz ehtiyojlarini tahlil qilish, jamoada ishlash va tadbirkorlik ko‘nikmalariga ega bo‘lish ham muhim kasbiy kompetensiyalar qatoriga kirmoqda.

nuqtayi nazardan, **zamonaviy kasbiy kompetensiya** tushunchasi tikuvchilik ta’limining mazmunini qayta ko‘rib chiqishni talab etadi. An’anaviy ta’lim modelida asosiy e’tibor muayyan texnologik operatsiyalarni bajarishga qaratilgan bo‘lsa, zamonaviy kompetensiyaviy yondashuv mutaxassisning

mustaqil fikrlashi, muammoli vaziyatlarda maqbul yechim topishi, yangi texnologiyalarni o‘zlashtirishi, ijodkorlik bilan ishlashi va o‘z kasbiy faoliyatini doimiy ravishda takomillashtirib borishini nazarda tutadi. Demak, tikuvchilik bo‘yicha mutaxassis tayyorlash jarayoni “bilim berish” modelidan “bilimni amaliyotda qo‘llash va kasbiy faoliyatga tayyorlash” modeliga bosqichma-bosqich o‘tishi lozim. Bu jarayonda ta’lim muassasalari va ish beruvchilar o‘rtasidagi hamkorlik alohida ahamiyatga ega. Mehnat bozorida qanday mutaxassislarga ehtiyoj mavjudligini aniqlash, o‘quv dasturlarini ishlab chiqarish talablari asosida yangilash, amaliy mashg‘ulotlarni real korxona va ishlab chiqarish muhitiga yaqinlashtirish hamda bitiruvchilarning bandligini ta’minlash kasbiy ta’lim samaradorligining muhim ko‘rsatkichlaridan hisoblanadi. Ayniqsa, tikuvchilik sohasida kichik ishlab chiqarish korxonalari, atelyelar, dizayn studiyalari va yakka tartibdagi tadbirkorlik subyektlari bilan hamkorlikni rivojlantirish o‘quvchilarning kasbiy tajriba orttirishiga xizmat qiladi.

O‘zbekistonning uzoq muddatli rivojlanish strategiyasida ham inson kapitalini rivojlantirish va sifatli ta’lim uchun munosib sharoitlar yaratish ustuvor vazifalardan biri sifatida belgilangan. Jumladan, **“O‘zbekiston — 2030” strategiyasi** doirasida har bir insonning o‘z salohiyatini ro‘yobga chiqarishi uchun munosib sharoitlar yaratish va sifatli ta’limni ta’minlashga qaratilgan vazifalar belgilangan. Bu esa kasbiy ta’limni zamonaviy iqtisodiyot va mehnat bozori talablariga mos ravishda rivojlantirish zaruratini yanada kuchaytiradi. Shuningdek, kasbiy ta’lim tizimini boshqarish va uning samaradorligini oshirish bo‘yicha yangi bosqichdagi islohotlar davom etmoqda. Xususan, **2025-yil 23-oktabrdagi PF-190-son “Kasbiy ta’lim tizimida boshqaruv samaradorligini oshirish chora-tadbirlari to‘g‘risida”gi Prezident Farmoni** kasbiy ta’lim tizimini yanada takomillashtirishga qaratilgan zamonaviy davlat siyosatining davomiyligini ko‘rsatadi.

Yuqoridagilardan kelib chiqib, tikuvchilik sohasida kasbiy kompetensiyalarni shakllantirish masalasi nafaqat ta’lim sifatini oshirish, balki yoshlarning bandligini ta’minlash, ularni zamonaviy mehnat bozoriga tayyorlash,

tadbirkorlik faoliyatiga yo‘naltirish va yengil sanoatning rivojlanishiga munosib hissa qo‘shadigan inson kapitalini shakllantirish nuqtayi nazaridan ham muhimdir. Shu sababli tikuvchilik ta’limida zamonaviy pedagogik texnologiyalar, amaliyotga yo‘naltirilgan o‘qitish, dual ta’lim, raqamli texnologiyalar va ish beruvchilar bilan hamkorlik mexanizmlarini keng joriy etish bugungi kunning dolzarb ilmiy-pedagogik vazifalaridan biri sifatida namoyon bo‘lmoqda.

Mazkur maqolada **tikuvchilik sohasida zamonaviy kasbiy kompetensiyalarni shakllantirishning mazmuni, ta’lim va mehnat bozori integratsiyasining pedagogik imkoniyatlari hamda kasbiy ta’limni zamonaviylashtirishning istiqbolli yo‘nalishlari** ilmiy-nazariy jihatdan tahlil qilinadi.

Zamonaviy jamiyat taraqqiyotining muhim omillaridan biri inson kapitalining sifatini oshirish va mehnat bozorining o‘zgaruvchan talablariga mos ravishda raqobatbardosh mutaxassislarni tayyorlashdan iborat. Iqtisodiyotning turli tarmoqlarida texnologik yangilanishlarning jadallashuvi kasbiy ta’lim mazmuniga ham yangicha talablarni qo‘ymoqda. Ayniqsa, yengil sanoat tarkibida muhim o‘rin egallaydigan tikuvchilik sohasida ishlab chiqarish jarayonlarining modernizatsiyalashuvi, yangi turdagi mato va materiallarning paydo bo‘lishi, zamonaviy tikuv mashinalari va avtomatlashtirilgan qurilmalarning keng qo‘llanilishi, kiyim dizayni va konstruksiyalashda raqamli texnologiyalardan foydalanish natijasida mazkur sohada faoliyat yurituvchi mutaxassislarning kasbiy kompetensiyalariga qo‘yiladigan talablar ham tubdan o‘zgarib bormoqda. Shuning uchun bugungi kasbiy ta’lim tizimida tikuvchilik mutaxassisini tayyorlash jarayonini faqat an’anaviy texnologik operatsiyalarni o‘rgatish bilan cheklab qo‘yish yetarli emas. Ta’lim oluvchi o‘z kasbini chuqur bilishi bilan bir qatorda zamonaviy ishlab chiqarish texnologiyalarini tushunishi, mustaqil qaror qabul qilishi, ijodiy fikrlashi, texnologik muammolarni tahlil qilishi, mahsulot sifatini baholashi, mehnat xavfsizligi qoidalariga rioya qilishi, iste’molchi ehtiyojlarini o‘rganishi va zarur hollarda mustaqil tadbirkorlik faoliyatini yo‘lga qo‘ya olishi lozim. Tikuvchilik sohasidagi kasbiy kompetensiya mazmunan

murakkab va ko‘p komponentli hodisa bo‘lib, u mutaxassisning nazariy bilimlari, amaliy ko‘nikmalari, kasbiy tajribasi, texnologik savodxonligi, ijodiy qobiliyati, kommunikativ madaniyati, mas’uliyati va mehnat faoliyatiga bo‘lgan munosabatining o‘zaro birligi asosida shakllanadi. Kompetensiyaviy yondashuv nuqtayi nazaridan qaralganda, o‘quvchining muayyan mavzu bo‘yicha bilimga ega bo‘lishining o‘zi uning kasbiy jihatdan tayyorligini anglatmaydi. Muhimi, u egallagan bilimlarini real ishlab chiqarish sharoitida qo‘llay olishi, yuzaga kelgan muammoni aniqlashi, uning sabablarini tahlil qilishi va maqbul yechimni mustaqil ravishda tanlay olishidir. Masalan, tikuvchilik yo‘nalishida tahsil olayotgan o‘quvchi matoning xususiyatlarini nazariy jihatdan bilishi mumkin, biroq mazkur mato uchun mos igna, ip, tikuv turi, mashina tezligi va texnologik ishlov berish usulini mustaqil tanlay olmasa, uning bilimlari to‘liq kasbiy kompetensiyaga aylangan deb bo‘lmaydi. Demak, kasbiy ta’lim jarayonida nazariy bilim bilan amaliy faoliyatning uzviyligini ta’minlash asosiy pedagogik vazifalardan biridir. Tikuvchilik kasbining o‘ziga xosligi shundaki, mazkur yo‘nalishda texnik va ijodiy faoliyat bir-biri bilan chambarchas bog‘langan. Kiyim yaratish jarayonida mutaxassis bir vaqtning o‘zida konstruktiv fikrlash, texnologik hisob-kitob, estetik did, ranglar uyg‘unligi, materialshunoslik, ergonomika va iste’molchi talablarini hisobga olishi kerak. Shu sababli tikuvchilik ta’limida o‘quvchilarning ijodiy kompetensiyalarini rivojlantirish ham alohida ahamiyatga ega. O‘quvchiga tayyor namunani takrorlashni o‘rgatish bilan bir qatorda undan yangi model yaratish, mavjud modelni takomillashtirish, turli matolar bilan tajriba o‘tkazish, rang va shakl uyg‘unligini aniqlash, individual buyurtma asosida kiyim loyihalash kabi faoliyatlarni bajarish talab etilishi zarur. Bunday yondashuv o‘quvchining mustaqil fikrlash qobiliyatini rivojlantiradi va uni kelajakdagi kasbiy faoliyatga yanada puxta tayyorlaydi.

Kasbiy kompetensiyalarni shakllantirishda ta’lim mazmunining mehnat bozori ehtiyojlariga mosligi muhim mezon hisoblanadi. Mehnat bozorida talab mavjud bo‘lmagan yoki ishlab chiqarish jarayonida qo‘llanilmaydigan bilim va ko‘nikmalarni ustuvor darajada o‘rgatish kasbiy ta’lim samaradorligini

pasaytirishi mumkin. Shu sababli tikuvchilik bo‘yicha ta’lim dasturlarini ishlab chiqishda hududdagi tikuvchilik korxonalari, kichik biznes subyektlari, dizayn studiyalari, atelyelar va boshqa ish beruvchilarning real ehtiyojlarini hisobga olish maqsadga muvofiq. Ish beruvchilar tomonidan talab qilinayotgan kasbiy ko‘nikmalar muntazam tahlil qilinib, o‘quv dasturlari mazmuniga tegishli o‘zgartirishlar kiritilishi ta’lim va mehnat bozori o‘rtasidagi uzviylikni kuchaytiradi. Bunday integratsiya natijasida bitiruvchi o‘qishni tamomlagach, ishlab chiqarish muhitiga moslashish uchun ortiqcha vaqt sarflamaydi, balki egallagan bilim va ko‘nikmalarini bevosita kasbiy faoliyatida qo‘llash imkoniyatiga ega bo‘ladi. Ta’lim va ishlab chiqarish integratsiyasi ayniqsa amaliy kasblar uchun muhimdir. Tikuvchilik ta’limida o‘quv ustaxonalari va laboratoriyalarning zamonaviy jihozlar bilan ta’minlanishi, ishlab chiqarish korxonalaridagi texnologik jarayonlar bilan ta’lim jarayonining uyg‘unlashtirilishi o‘quvchilarning amaliy kompetensiyalarini rivojlantirish imkoniyatlarini kengaytiradi. O‘quvchi faqat o‘quv mashinasida ishlash bilan cheklanib qolmasdan, zamonaviy ishlab chiqarish liniyalari, maxsus tikuv mashinalari, dazmollash va namlab-isitib ishlov berish uskunalari, sifat nazorati vositalari hamda avtomatlashtirilgan texnologik jarayonlar bilan tanishishi zarur. Bu esa uning real mehnat sharoitiga moslashuvchanligini oshiradi. Tikuvchilik ta’limida dual ta’lim elementlaridan foydalanish ham mazkur integratsiyani kuchaytirishning samarali mexanizmlaridan biridir. Dual ta’limning mohiyati o‘quvchining ta’lim muassasasida nazariy bilim olishi bilan bir vaqtda ishlab chiqarish korxonasida amaliy faoliyat olib borishiga asoslanadi. Bunday yondashuv natijasida o‘quvchi kasbiy faoliyatning real sharoitlarini bevosita kuzatadi, ish jarayonidagi muammolarni amaliy jihatdan o‘rganadi, mehnat intizomi va kasbiy mas’uliyatni his qiladi hamda tajribali mutaxassislarning ish usullarini o‘zlashtiradi. Shu bilan birga, ish beruvchi ham bo‘lajak xodimning kasbiy salohiyatini oldindan baholash imkoniyatiga ega bo‘ladi. Natijada ta’lim muassasasi, o‘quvchi va ish beruvchi manfaatlari o‘zaro uyg‘unlashadi.

Tikuvchilik sohasida zamonaviy kasbiy kompetensiyalarni shakllantirishning yana bir muhim yo‘nalishi raqamli texnologiyalardan samarali foydalanish bilan bog‘liq. Hozirgi vaqtda kiyim konstruksiyasini yaratish, andoza tayyorlash, modelni vizuallashtirish va ishlab chiqarish jarayonlarini rejalashtirishda turli kompyuter dasturlaridan foydalanish imkoniyatlari kengayib bormoqda. Raqamli texnologiyalarning ta’lim jarayoniga joriy etilishi o‘quvchilarga kiyim modelini virtual muhitda yaratish, uning konstruktiv xususiyatlarini tahlil qilish, turli dizayn variantlarini sinab ko‘rish va ishlab chiqarishdan oldin xatolarni aniqlash imkonini beradi. Bu esa moddiy resurslardan tejamkor foydalanish bilan bir qatorda o‘quvchilarning raqamli savodxonligi va texnologik kompetensiyasini rivojlantiradi.

Raqamlashtirish jarayoni tikuvchilik mutaxassisining kasbiy faoliyatini ham o‘zgartirmoqda. Zamonaviy tikuvchilik korxonalarida ishlab chiqarish jarayonlarining ayrim bosqichlari avtomatlashtirilmoqda, mahsulot dizayni va konstruksiyasi elektron shaklda yaratilmoqda, buyurtmalarni qabul qilish va mijozlar bilan muloqot qilishda raqamli platformalardan foydalanilmoqda. Shu bois kasbiy ta’limda o‘quvchilarga faqat tikish texnologiyasini o‘rgatish emas, balki raqamli muhitda ishlash, elektron ma’lumotlardan foydalanish, texnologik axborotni izlash va tahlil qilish, zamonaviy dasturlar bilan ishlash ko‘nikmalarini ham shakllantirish zarur. Kelajakdagi tikuvchi yoki tikuvchilik texnologi uchun raqamli kompetensiya oddiy qo‘shimcha ko‘nikma emas, balki uning kasbiy raqobatbardoshligini belgilovchi muhim omillardan biriga aylanmoqda. Kasbiy ta’limda innovatsion pedagogik texnologiyalardan foydalanish ham o‘quvchilarning kasbiy kompetensiyalarini rivojlantirishda katta imkoniyat yaratadi. An’anaviy tushuntirish va ko‘rsatib berish metodlari bilan bir qatorda muammoli ta’lim, loyiha metodi, amaliy vaziyatlarni tahlil qilish, kichik guruhlarda ishlash, keys-stadi, portfolio, kasbiy modellashtirish va mustaqil amaliy topshiriqlardan foydalanish o‘quvchining ta’lim jarayonidagi faolligini oshiradi. Masalan, o‘quvchilarga “ma’lum yosh guruhiga mo‘ljallangan kiyim kolleksiyasini yaratish” vazifasi berilganda ular bir vaqtning o‘zida bozor talabini

o‘rganish, model tanlash, materiallarni aniqlash, konstruksiya ishlab chiqish, texnologik ketma-ketlikni belgilash, mahsulot tannarxini hisoblash va tayyor mahsulotni taqdim etish kabi bir nechta kasbiy faoliyatni bajaradilar. Bunday kompleks topshiriqlar kasbiy kompetensiyalarning tabiiy ravishda shakllanishiga xizmat qiladi.

Tadbirkorlik kompetensiyasining shakllanishi o‘quvchining kasbiy imkoniyatlarini kengaytiradi. Masalan, tikuvchilikni yaxshi o‘zlashtirgan shaxs o‘z uyida kichik tikuvchilik xizmatini tashkil etishi, individual buyurtmalar asosida ishlashi, milliy liboslar yoki zamonaviy kiyimlar kolleksiyasini yaratishi, tayyor mahsulotlarni ijtimoiy tarmoqlar orqali targ‘ib qilishi va elektron savdo orqali realizatsiya qilishi mumkin. Bunday imkoniyatlar ayniqsa yoshlarning bandligini ta’minlash, o‘zini o‘zi band qilish va kichik biznesni rivojlantirish nuqtayi nazaridan muhimdir. Demak, kasbiy ta’limning vazifasi faqat mavjud ish o‘rinlariga mos kadr tayyorlash emas, balki yoshlarni yangi ish o‘rinlarini yaratishga qodir bo‘lgan faol va tashabbuskor mutaxassis sifatida shakllantirishdan ham iborat bo‘lishi kerak. Tikuvchilikda kasbiy kompetensiyalarni shakllantirish jarayonida mehnat madaniyati va xavfsizlik kompetensiyasiga ham jiddiy e’tibor qaratish lozim. Tikuv mashinalari, elektr jihozlari, dazmollash uskunalari, qaychi va boshqa asbob-uskunalar bilan ishlashda xavfsizlik qoidalariga rioya qilish nafaqat o‘quvchining sog‘lig‘ini muhofaza qilish, balki ishlab chiqarish samaradorligini ta’minlashning ham muhim shartidir. Shu sababli mehnat xavfsizligi qoidalari nazariy tarzda tushuntirib qo‘yilmasdan, har bir amaliy mashg‘ulot jarayonida bevosita qo‘llanilishi va nazorat qilinishi kerak. O‘quvchida ish joyini to‘g‘ri tashkil etish, jihozlardan ehtiyotkorlik bilan foydalanish, texnologik intizomga rioya qilish va ishlab chiqarish madaniyatini saqlash ko‘nikmalari shakllantirilishi zarur. Bundan tashqari, zamonaviy tikuvchilik mutaxassisidan ekologik kompetensiya ham talab etiladi. To‘qimachilik va tikuvchilik sanoatida materiallardan oqilona foydalanish, chiqindilarni kamaytirish, mato qoldiqlarini qayta ishlatish, ekologik xavfsiz materiallardan foydalanish va ishlab chiqarish jarayonida resurslarni tejash

masalalari tobora muhimlashib bormoqda. Kasbiy ta’lim jarayonida o‘quvchilarga materiallarni tejamkor joylashtirish, andozalarni optimal joylashtirish orqali chiqindilarni kamaytirish, qolgan materiallardan yangi mahsulotlar yaratish kabi amaliy topshiriqlar berilishi ekologik va iqtisodiy kompetensiyalarning birgalikda rivojlanishiga xizmat qiladi.

Tikuvchilik sohasida kompetensiyalarni baholash tizimi ham zamonaviy talablarga mos ravishda takomillashtirilishi zarur. Faqat nazariy savollarga berilgan javoblar asosida o‘quvchining kasbiy tayyorgarligini baholash to‘liq natija bermaydi. Chunki kasbiy kompetensiya, avvalo, amaliy faoliyatda namoyon bo‘ladi. Shu sababli baholash jarayonida amaliy topshiriqlar, loyiha ishlari, tayyor mahsulot sifati, texnologik ketma-ketlikka rioya qilish, mustaqil qaror qabul qilish, ish joyini tashkil etish va xavfsizlik qoidalariga rioya qilish kabi mezonlarni hisobga olish lozim. Portfolio asosida baholash ham o‘quvchining kasbiy rivojlanish dinamikasini kuzatish imkonini beradi. Unda o‘quvchining yaratgan modellari, bajargan amaliy ishlari, loyihalari, dizayn namunalari va kasbiy yutuqlari jamlanib boradi. Kasbiy ta’limning samaradorligini oshirishda pedagogning kasbiy kompetensiyasi ham hal qiluvchi omillardan biridir. Zamonaviy tikuvchilik o‘qituvchisi yoki ishlab chiqarish ta’limi ustasi nafaqat pedagogik bilimlarga, balki sohadagi texnologik yangiliklardan xabardor bo‘lishi, yangi uskunalar va materiallar bilan ishlashni bilishi, zamonaviy dizayn tendensiyalarini kuzatib borishi hamda o‘quvchilarni mustaqil ijodiy faoliyatga yo‘naltira olishi zarur. O‘qituvchining o‘zi zamonaviy texnologiyalarni bilmasa, o‘quvchilarda zamonaviy texnologik kompetensiyalarni to‘laqonli shakllantirish qiyinlashadi. Shu sababli kasbiy ta’lim pedagoglarini qayta tayyorlash va malakasini oshirish tizimida ishlab chiqarish korxonalarida stajirovka o‘tash, yangi texnologiyalarni o‘rganish va amaliy tajribani yangilash imkoniyatlarini kengaytirish maqsadga muvofiq.

Umuman olganda, tikuvchilik sohasida zamonaviy kasbiy kompetensiyalarni shakllantirish jarayoni kompleks va uzluksiz xarakterga ega bo‘lib, unda ta’lim mazmuni, pedagogik texnologiyalar, ishlab chiqarish

amaliyoti, raqamli texnologiyalar, mehnat bozori talablari va ish beruvchilar bilan hamkorlik yagona tizim sifatida qaralishi lozim. Kasbiy ta’limning kelajagi aynan mana shu integratsion yondashuv bilan belgilanadi. O‘quvchiga faqat kasbning texnik jihatlarini o‘rgatish emas, balki unda mustaqil fikrlash, ijodkorlik, muammoli vaziyatlarni hal qilish, raqamli texnologiyalardan foydalanish, jamoada ishlash, tadbirkorlik va doimiy kasbiy rivojlanishga tayyorlik kabi universal hamda maxsus kompetensiyalarni shakllantirish zarur. Bunday yondashuv natijasida tikuvchilik yo‘nalishida tahsil olayotgan yoshlar zamonaviy mehnat bozorining o‘zgaruvchan talablariga moslasha oladigan, raqobatbardosh, tashabbuskor va yuqori malakali mutaxassislarga aylanish imkoniyatiga ega bo‘ladilar. Shu ma’noda, tikuvchilik sohasini rivojlantirish va unda zamonaviy kasbiy kompetensiyalarni shakllantirish nafaqat ta’lim tizimining, balki yengil sanoat, tadbirkorlik, bandlik va inson kapitalini rivojlantirishning strategik yo‘nalishlaridan biri sifatida qaralishi lozim.

XULOSA

Tikuvchilik sohasida zamonaviy kasbiy kompetensiyalarni shakllantirish bugungi kunda kasbiy ta’lim tizimining muhim va dolzarb yo‘nalishlaridan biri hisoblanadi. Mehnat bozorining jadal o‘zgarishi, ishlab chiqarish texnologiyalarining takomillashuvi, raqamli texnologiyalarning keng joriy etilishi hamda iste’molchilarning mahsulot sifati va dizayniga bo‘lgan talablarining ortib borishi tikuvchilik sohasida faoliyat yuritadigan mutaxassislardan yangi bilim, ko‘nikma va malakalarni talab qilmoqda. Shu sababli zamonaviy tikuvchilik mutaxassisini tayyorlash jarayonida an’anaviy kasbiy ko‘nikmalar bilan bir qatorda texnologik, raqamli, kreativ, kommunikativ, tadbirkorlik va muammoli vaziyatlarni hal qilish kompetensiyalarini shakllantirish muhim pedagogik vazifa sifatida namoyon bo‘lmoqda. Tikuvchilik ta’limini takomillashtirishda ta’lim muassasalari va ishlab chiqarish korxonalari o‘rtasidagi hamkorlikni kuchaytirish alohida ahamiyatga ega. Ish beruvchilarning ta’lim dasturlarini shakllantirishdagi ishtiroki, amaliy mashg‘ulotlarni ishlab chiqarish korxonalarida tashkil etish, mutaxassislar ishtirokida mahorat darslarini o‘tkazish va o‘quvchilarni real

mehnat sharoitlariga moslashtirish ta’lim samaradorligini sezilarli darajada oshiradi. Ayniqsa, dual ta’lim mexanizmlaridan samarali foydalanish orqali nazariy bilim va amaliy faoliyat o‘rtasidagi uzviylikni ta’minlash mumkin. Professional ta’lim tizimida dual ta’limni tashkil etish bo‘yicha alohida normativ asosning mavjudligi ushbu yo‘nalishning amaliy ahamiyatini ko‘rsatadi. Shuningdek, tikuvchilik ta’limida raqamli texnologiyalardan foydalanish zamonaviy mutaxassis tayyorlashning muhim shartlaridan biridir. Kiyim konstruksiyasini raqamli loyihalash, andozalarni elektron shaklda yaratish, dizaynni vizuallashtirish, ishlab chiqarish jarayonlarini avtomatlashtirish va elektron tijorat imkoniyatlaridan foydalanish bo‘yicha bilimlarning shakllantirilishi bitiruvchilarning mehnat bozoridagi raqobatbardoshligini oshiradi. Shu sababli kasbiy ta’lim dasturlarida raqamli savodxonlikni rivojlantirishga qaratilgan amaliy topshiriqlar ulushini ko‘paytirish maqsadga muvofiq.

Umuman, tikuvchilik sohasida kasbiy ta’limning kelajagi ta’lim, ishlab chiqarish va mehnat bozori o‘rtasidagi integratsiyani mustahkamlash bilan bevosita bog‘liq. Zamonaviy kasbiy ta’lim modeli o‘quvchining faqat ma’lum bir kasbni egallashini emas, balki uning o‘zgaruvchan mehnat bozorida mustaqil faoliyat yurita olishi, yangi texnologiyalarni tez o‘zlashtirishi, o‘z ustida muntazam ishlashi va yangi kasbiy imkoniyatlarni yaratishga qodir bo‘lishini ta’minlashi lozim.

FOYDALANILGAN MANBALAR

1. O‘zbekiston Respublikasi. **“Ta’lim to‘g‘risida”gi Qonun.** O‘RQ-637-son, 2020-yil 23-sentabr.

2. O‘zbekiston Respublikasi Prezidenti. **“Professional ta’lim tizimini yanada takomillashtirishga doir qo‘shimcha chora-tadbirlar to‘g‘risida”gi Farmon.** PF-5812-son, 2019-yil 6-sentabr. Mazkur farmon professional ta’limni mehnat bozori talablariga moslashtirish va yuqori malakali kadrlar tayyorlash vazifalarini belgilagan.

3. O‘zbekiston Respublikasi Vazirlar Mahkamasi. **“O‘zbekiston Respublikasida uzluksiz boshlang‘ich, o‘rta va o‘rta maxsus professional ta’lim tizimini tartibga soluvchi normativ-huquqiy hujjatlarni tasdiqlash to‘g‘risida”gi Qaror.** 466-son, 2020-yil 7-avgust.

4. O‘zbekiston Respublikasi Vazirlar Mahkamasi. **“Professional ta’lim tizimida dual ta’limni tashkil etish chora-tadbirlari haqida”gi Qaror.** 163-son, 2021-yil 29-mart.

5. O‘zbekiston Respublikasi Prezidenti. **“Kasbiy ta’lim tizimida boshqaruv samaradorligini oshirish chora-tadbirlari to‘g‘risida”gi Farmon.** PF-190-son, 2025-yil 23-

oktabr. Mazkur farmon kasbiy ta’lim tizimining boshqaruv samaradorligini oshirishga qaratilgan yangi bosqichdagi chora-tadbirlarni belgilaydi.

6. O‘zbekiston Respublikasi Prezidenti. **“O‘zbekiston — 2030” strategiyasi.** O‘zbekiston Respublikasining uzoq muddatli ijtimoiy-iqtisodiy rivojlanish ustuvor yo‘nalishlariga oid normativ-huquqiy hujjatlar.

7. O‘zbekiston Respublikasi Vazirlar Mahkamasi. **“Boshlang‘ich, o‘rta va o‘rta maxsus professional ta’lim to‘g‘risidagi hujjatlarning davlat namunasini tasdiqlash haqida”gi Qaror.** 734-son, 2020-yil 19-noyabr.

8. O‘zbekiston Respublikasi Vazirlar Mahkamasi. **“Professional ta’lim muassasalarining boshqaruv hamda pedagog kadrlarini qayta tayyorlash va malakasini oshirish tizimini yanada takomillashtirish chora-tadbirlari to‘g‘risida”gi Qaror.** 106-son, 2021-yil 26-fevral.

9. O‘zbekiston Respublikasi Oliy ta’lim, fan va innovatsiyalar vazirligi. **Kasbiy ta’lim tizimiga oid normativ-huquqiy hujjatlar va metodik materiallar.** Toshkent.

10. **Kasbiy ta’lim tizimini rivojlantirish, mehnat bozori va milliy malaka tizimiga oid ilmiy-metodik materiallar.** O‘zbekiston Respublikasi Milliy malaka tizimini rivojlantirish instituti materiallari.

QAYTA TIKLANUVCHI ENERGIYA ASOSIDAGI AQLLI YO‘L INFRASTRUKTURASI VA UNING PEDAGOGIK TIZIMDAGI O‘RNI

N.B.Xolmurzayev

Termiz davlat muhandislik va agrotexnologiyalar universiteti

Annotatsiya: *Mazkur maqolada qayta tiklanuvchi energiya manbalaridan (quyosh energiyasi) foydalanishga asoslangan aqlli yo‘l infratuzilmasini rivojlantirish hamda ushbu texnik-muhandislik yechimlarini muhandislik va texnik ta'lim pedagogikasiga integratsiya qilish masalalari ko‘rib chiqiladi. Aqlli yo‘l infratuzilmasi tarkibidagi avtonom LED yoritish, IoT sensorlari va energiya saqlash tizimlarining ishlash prinsiplari orqali talabalarda ekologik madaniyat, muhandislik tafakkuri hamda STEM/STEAM yondashuvlarini shakllantirish metodikasi yoritilgan.*

Kalit so‘zlar: *aqlli yo‘l, qayta tiklanuvchi energiya, muhandislik pedagogikasi, STEM yondashuv, IoT, ekologik tarbiya, LED yoritish, raqamli ta'lim, energiya samaradorligi.*

Abstract: *This article examines the development of smart road infrastructure based on the use of renewable energy sources (solar energy) and the integration of these engineering and technical solutions into engineering and technical education pedagogy. It highlights the methodology for fostering ecological culture, engineering thinking, and STEM/STEAM approaches among students through the operating principles of autonomous LED lighting, IoT sensors, and energy storage systems integrated within smart road infrastructure.*

Keywords: *smart road, renewable energy, engineering pedagogy, STEM approach, IoT, ecological education, LED lighting, digital education, energy efficiency.*

KIRISH

Zamonaviy transport va raqamli infratuzilmaning jadal rivojlanishi nafaqat texnik sohada, balki oliy ta'lim tizimida ham yangicha pedagogik yondashuvlarni talab etmoqda. Avtomobil yo‘llarini shunchaki harakatlanish vositasi sifatida emas, balki energiya, aloqa hamda monitoring tizimlarini birlashtirgan murakkab muhandislik va ta'lim ob'ekti sifatida qarash lozim. Chekka hududlarda energiyaga bo‘lgan ehtiyojni muqobil energiya manbalari orqali qondirish texnik masala

bo‘lishi bilan birga, bo‘lajak muhandislarni tayyorlashda amaliy pedagogik vosita vazifasini o‘taydi.

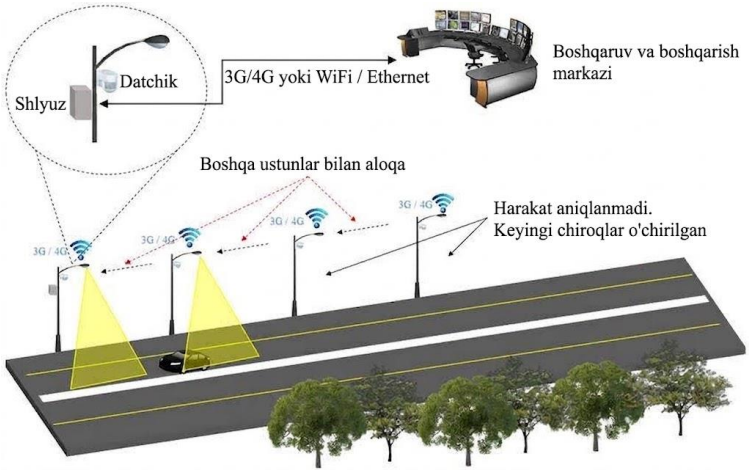
Aqlli Yo‘l Infratuzilmasining Konseptual Tuzilishi va Ta'limiy Qatlamlari. Aqlli yo‘l infratuzilmasini pedagogik jarayonda tushuntirish va o‘rgatish uchun uni funksional qatlamlarga ajratgan holda talabalarga yetkazish yuqori samaradorlik beradi:

Tizim qatlamlari	Asosiy texnik elementlar	Pedagogik va ta'limiy maqsadi
Energiya ishlab chiqarish	PV panellar, MPPT kontroller	Quyosh energiyasini elektr energiyasiga aylantirish fizikasini o‘rgatish.
Energiyani saqlash	Akkumulyator, BMS, invertor	Energiya balansi va zaxira manbalarini boshqarish ko‘nikmalarini shakllantirish.
Monitoring va sezish	Harakat, yorug‘lik, ob-havo sensorlari	IoT va datchiklar bilan ishlash bo‘yicha amaliy mashg‘ulotlar o‘tkazish.
Aloqa va boshqaruv	Mikrokontroller, IoT gateway, simsiz aloqa	Dasturlash hamda ma'lumotlar uzatish algoritmlarini tahlil qilish.
Foydalanuvchi xizmatlari	Aqlli LED, VMS tablolari, kameralar	Yo‘l harakati xavfsizligi va inson omiliga yo‘naltirilgan texnologik yechimlar.

Aqilli LED yoritish tizimi. Yo‘l bo‘yidagi yoritish tizimi aqlli infratuzilmaning eng ko‘zga ko‘rinadigan qismidir. LED texnologiyasi yuqori yorug‘lik samaradorligi, uzoq xizmat muddati va quvvatni boshqarish imkoniyati bilan ajralib turadi. An’anaviy yoritishdan farqli ravishda aqlli LED tizimi yorug‘likni yo‘l sharoitiga qarab dinamik ravishda o‘zgartirishi mumkin.

Masalan, tunning transport oqimi past bo‘lgan vaqtida chiroqlar 30–50 foiz nominal quvvatda ishlashi, harakat sensori transport vositasini aniqlaganda esa 80–100 foizgacha oshirilishi mumkin. Bunda aniq boshqaruv chegaralari yo‘l kategoriyasi, ruxsat etilgan tezlik, piyodalar mavjudligi va amaldagi yoritish me’yorlariga muvofiq belgilanadi. Muhim jihat shundaki, energiya tejash yo‘l harakati xavfsizligi talablaridan ustun qo‘yilmasligi kerak.

LED yoritgichlarining aqlli boshqaruvi dimming, jadval asosidagi boshqaruv yoki sensorli boshqaruv orqali amalga oshirilishi mumkin. Sensorli yondashuvda PIR, radar yoki boshqa mavjudlik sensori qo‘llanadi. Radar sensorlari transport vositalarining tezligi va yo‘nalishini aniqlash imkoniyati bilan ayrim sharoitlarda afzal bo‘lishi mumkin. Sensorlardan kelayotgan ma’lumotlar markaziy serverga yuborilib, ekspluatatsiya va texnik xizmat ko‘rsatish uchun statistik ma’lumotlar bazasi yaratiladi.(1-rasm)



1-rasm. Aqlli yo'l va ITS

Muhandislik Pedagogikasi va STEM/STEAM Yondashuvi Integratsiyasi. Aqlli yo‘l infratuzilmasi texnologiyalarini ta'lim jarayoniga tatbiq etish orqali quyidagi pedagogik maqsadlarga erishiladi:

- **Interdisiplinar (fanlararo) ta'lim:** Talabalar bir vaqtning o‘zida fizika (fotovoltaika), dasturlash (mikrokontrollerlar), ekologiya va transport xavfsizligi fanlarini amalda birlashtiradi.

- **Muammoli ta'lim (Problem-Based Learning):** "O‘zbekistonning issiq va chang iqlimida quyosh panellari samaradorligini oshirish" kabi real loyihaviy vazifalar orqali talabalarda tanqidiy va ijodiy hamda muhandislik tafakkuri rivojlantiriladi.
- **Ekologik tarbiya hamda barqaror rivojlanish:** Muqobil energiya va uglerod chiqindilarini kamaytirish texnologiyalarini o‘rganish orqali yoshlarda yashil iqtisodiyot va atrofdagi muhitni asrashga bo‘lgan mas'uliyat hissi shakllanadi.

O‘zbekiston Sharoitida Amaliy-Pedagogik Pilot Loyihalarni Tashkil Etish. Oliy o‘quv yurtlari hududida yoki unga tutash yo‘llarda 0.5–2 km masofada 20–50 ta aqlli yoritish va monitoring nuqtalaridan iborat "Pilot ta'lim poligonlari"ni yaratish taklif etiladi. Ushbu poligonlar yordamida:

1. Talabalar real vaqt rejimida energiya ishlab chiqarish hamda sarflash monitoringini olib borishadi.
2. Sensor va datchiklardan kelayotgan ma'lumotlarni tahlil qilish bo‘yicha laboratoriya mashg‘ulotlari o‘tkaziladi.
3. Changlanish va iqlimiy omillarning quyosh panellariga ta'sirini kamaytirish bo‘yicha ilmiy-tadqiqot ishlari (VKR va magistrlik dissertatsiyalari) bajariladi.

XULOSA

Qayta tiklanuvchi energiyaga asoslangan aqlli yo‘l infratuzilmasi nafaqat iqtisodiy va ekologik samaradorlikka ega, balki zamonaviy muhandislik pedagogikasining muhim elementidir. U bo‘lajak mutaxassislarni amaliy bilimlarga yo‘naltirish, IoT hamda yashil texnologiyalarni kompleks o‘rgatishda yetakchi vosita bo‘lib xizmat qiladi

FOYDALANILGAN ADABIYOTLAR

1. International Energy Agency (IEA). Renewables 2024: Analysis and Forecast to 2030. Paris: IEA, 2024.
2. International Renewable Energy Agency (IRENA). Renewable Power Generation Costs in 2023. Abu Dhabi: IRENA, 2024.
3. IEC 62446-1. Photovoltaic (PV) systems — Requirements for testing, documentation and maintenance — Part 1: Grid connected systems.

4. ISO 37120. Sustainable cities and communities — Indicators for city services and quality of life. International Organization for Standardization.

5. O‘zbekiston Respublikasi Energetika vazirligi. Qayta tiklanuvchi energiya manbalarini rivojlantirish bo‘yicha ochiq materiallar va statistik ma’lumotlar.

ХУДОЖЕСТВЕННО-ЭСТЕТИЧЕСКИЕ ВОЗМОЖНОСТИ ПУЗЫРЬКОВОГО ГЛАЗИРОВАНИЯ В ОБРАБОТКЕ ПОВЕРХНОСТИ КЕРАМИЧЕСКИХ ИЗДЕЛИЙ

Мадумарова Зухрахон Рашиджон кизи

Выпускница магистратуры Кокандского государственного университета.

E-mail: zuhramadumarova07@gmail.com

Аннотация. *В тезисе рассматриваются художественно-эстетические и педагогические возможности пузырькового глазирования («bubble glazing»). Анализируется синтез традиционных орнаментальных систем керамических школ Ферганской долины (Коканд, Риштан) с экспериментальной фактурной поверхностью на основе композиционных законов наккошлыка. Дополнительно обосновывается целесообразность применения техники диффузии «Мокка» («mocha diffusion») на занятиях по декоративно-прикладному искусству для развития у студентов творческого мышления, чувства фактуры, цветовой гармонии и композиционного анализа.*

Ключевые слова: *художественная керамика, пузырьковое глазирование, bubble glazing, диффузия Мокка, mocha diffusion, декоративно-прикладное искусство, фактура, композиция, ислими, гирих, школы Ферганской долины.*

Abstract*.The paper examines the artistic, aesthetic, and pedagogical possibilities of bubble glazing in ceramic surface treatment. The synthesis of traditional ornamental systems of the Fergana Valley ceramic schools (Kokand, Rishtan) with experimental textured surfaces based on compositional laws of ornamental art is analyzed. In addition, the expediency of integrating the mocha diffusion technique into decorative arts education is substantiated to foster students' creative thinking, sense of texture, color harmony, and compositional analysis.*

Keywords: *artistic ceramics, bubble glazing, mocha diffusion, decorative and applied arts, texture, composition, islimi, girih, Fergana Valley schools.*

ВВЕДЕНИЕ

В системе высшего художественного образования важной задачей является сочетание национальных художественных традиций с современными способами проектирования и обработки материалов [1]. При

подготовке будущих специалистов в области изобразительного и декоративно-прикладного искусства недостаточно ограничиваться только репродуктивными методами. Современное обучение должно создавать условия для самостоятельного проектирования, творческого поиска и осознанного выбора художественно-технологических решений [2].

Традиционная керамика Ферганской долины — в частности кокандская и риштанская школы — отличается богатым историческим наследием, уникальной колористической гаммой и традициями применения щелочных глазурей [3]. В её декоративной системе традиционно преобладают растительные мотивы ислими, геометрические построения гирих, центральные медальоны и орнаментальные бордюры.

Сохранение этих многовековых традиций не исключает их современного переосмысления. Инновационный подход в прикладном искусстве предполагает гармоничное объединение традиционного орнаментального языка с современными фактурными приемами [4]. Одним из таких перспективных направлений является сочетание традиционной орнаментальной композиции с фактурным пузырьковым глазированием («bubble glazing»). Данный подход позволяет рассматривать поверхность керамического изделия не только как основу для нанесения орнамента, но и как самостоятельное выразительное средство.

В работе использованы методы художественно-технологического анализа, композиционно-стилистического анализа, теоретического моделирования и педагогического наблюдения.

ОСНОВНАЯ ЧАСТЬ

Понятие и технология пузырькового глазирования.В данном исследовании термин «puzirok» используется как обозначение способа нанесения глазурной суспензии с помощью устойчивой пены. В англоязычной керамической практике близкий способ описывается термином *bubble glazing* [5].

Суть метода заключается в образовании пузырьков в глазурной суспензии и переносе пенного слоя на предварительно обожжённую керамическую поверхность. После разрушения пузырьков на изделии остаются округлые, сетчатые или органические следы глазури. В результате поверхность приобретает неоднородную фактуру.

Величина и плотность пузырьков зависят от состава глазурной суспензии, её вязкости, количества воды, вида пенообразующего компонента и способа нанесения [6]. При работе необходимо учитывать, что образование пузырей, кратеров и проколов зависит от толщины слоя, выделения газов и режима обжига [7].

Художественно-эстетически возможности. Пузырьковое глазирование обладает несколькими художественно-эстетическими преимуществами:

- **Рельефно-фактурный эффект:** В зависимости от размера пузырьков поверхность приобретает мелкосетчатую, ячеистую или крупноокруглую структуру.
- **Цветовая градация:** Неравномерная толщина глазурного слоя способствует появлению различной интенсивности цвета и мягких тональных переходов, особенно выразительных при использовании бирюзово-синих и зеленых пигментов, характерных для керамики Ферганской долины [3].
- **Контраст фактур:** Фактурный слой может размещаться в качестве фона, внешней каймы или акцента, сохраняя читаемость центрального орнамента.

Сочетание фактуры и орнамента на основе законов композиции.Построение гармоничной орнаментальной композиции требует строгого соблюдения ключевых законов искусства наккошлыка: единства, соподчиненности, ритма и равновесия [4]. При построении узора учитывается размещение основных несущих стеблей (*таноб*), а также их обогащение элементами *бофта* и *шукуфта* [4].

В учебной практике пузырьковую фактуру целесообразно сочетать с традиционными орнаментальными элементами (*ислими*, *гирих*, бордюры). Композиционное сочетание осуществляется в следующих вариантах:

#Фактурный слой как фон для орнамента;

#Размещение пузырьковой поверхности по внешней кайме изделия;

#Сопоставление гладкой центральной части с фактурным периферийным полем;

#Фактура как самостоятельный ритмический элемент.

Методические возможности применения в обучении

Включение техники в практические занятия проходит по четырем этапам [8].

#Аналитический этап: Изучение традиционных орнаментов, их символики, симметрии и ритма [4].

#Эскизный этап: Разработка аналитических эскизов с трансформацией фона и масштаба.

#Технологическая проба: Изготовление тестовых образцов с фиксацией результатов в рабочем журнале.

#Проектирование: Разработка и исполнение самостоятельного керамического проекта, способствующего развитию композиционного мышления студентов [4].

Помимо техники пузыркового глазирования, в процессе преподавания дисциплины «Декоративно-прикладное искусство» представляется целесообразным апробировать набирающую популярность в современной художественной керамике технику «Мокка» (*mocha diffusion*) [9]. Данный метод основан на нанесении кислотного пигментного состава на влажный ангобный слой, в результате чего образуются дендритные, древовидные и органические графические узоры. Внедрение техники «Мокка» наряду с пузырьковым глазированием расширяет технологический кругозор студентов и стимулирует их к экспериментальному поиску новых выразительных форм.

ЗАКЛЮЧЕНИЕ

Пузырьковое глазирование («puzirok») обладает значительным художественно-эстетическим потенциалом для обработки поверхности керамических изделий. Данная техника позволяет создавать выразительные фактурные и цветовые эффекты, гармонично сочетающиеся с традиционными растительными и геометрическими орнаментами узбекской керамики.

Синтез традиционных композиционных правил наккошлыка и современных фактурных методов (включая техники «bubble glazing» и «mocha diffusion») расширяет возможности художественного самовыражения [4]. В образовательном процессе данные техники целесообразно использовать для развития у студентов навыков композиционного анализа, чувства материала, цветовой гармонии и экспериментального мышления.

СПИСОК ЛИТЕРАТУРЫ

1. Shukurov N. M. Synthesis of traditional ornaments and modern textures in Uzbek applied arts // *Heritage and Modernity*. 2021. Vol. 3, No. 1. P. 112–118.

2. Abdullaev A. A. Interactive and experimental methods in teaching fine and decorative arts // *Journal of Pedagogy and Art Education*. 2022. Vol. 5, No. 2. P. 45–50.

3. Каюмов Э. К., Акбаралиев Б. Б. Традиции керамики Ферганской долины [Farg‘ona vodiysi kulolchiligi an‘analari] // *Theory and Analytical Aspects of Recent Research: International Scientific-Online Conference*. 2025. Vol. 35. P. 16–22.

4. Бакаев Ш. Ш. Составление и применение композиции в декоративно-прикладном искусстве с гармонизацией традиционных и современных узоров [Amaliy bezak san’atida an’anaviy va zamonaviy naqshlarini uyg’unlashtirib kompozitsiya tuzish va qo‘llash] // *Inter Education & Global Study*. 2024. No. 1. P. 15–24.

5. Taylor S. *Experimental Glazing Techniques for Studio Ceramics*. Crowood Press, 2018. 160 p.

6. Cooper E. *10,000 Years of Pottery*. 4th ed. British Museum Press, 2019. 352 p.

7. Hamer F., Hamer J. *The Potter's Dictionary of Materials and Techniques*. 6th ed. Bloomsbury Publishing, 2015. 416 p.

8. Рахимов К. С. Методика преподавания декорирования керамики в высшем художественном образовании [Methodology of teaching ceramic decoration in higher art education] // *Artistic Education and Pedagogy*. 2023. Vol. 1, No. 4. P. 88–94.

9. Lou R. *Mocha Diffusion Techniques in Ceramic Art*. Ceramic Arts Network Press, 2020. 128 p.

10. Хакимов А. А. *Традиционные ремесла и декоративно-прикладное искусство Узбекистана* [Traditional Crafts and Decorative Arts of Uzbekistan]. Ташкент: San'at Publishing, 2020. 264 с.

IMPROVING AI-BASED INTERACTIVE TEACHING METHODOLOGY IN THE 'MATERIALS RESISTANCE' COURSE

Allanazarov Qo'ldosh Olimovich

Assistent

Termiz davlat muhandislik va agrotexnologiyalar universiteti

quldosh0616@gmail.com

Abstract. *When students cannot connect stress–strain concepts with real structural problems, Materials Resistance lessons become calculation exercises rather than meaningful engineering learning. This study aimed to improve instructional design through artificial intelligence-supported interactive activities and problem-based visualization. A three-stage quasi-experimental pretest–posttest educational study involved 120 students: an experimental group of 60 and a control group of 60. Achievement was measured before and after the intervention, alongside learning engagement. The overall pretest score was M = 60.4 (SD = 8.1; range 42–78), while the posttest score reached M = 78.6 (SD = 9.2; range 55–94). The experimental group achieved 84.7 points, compared with 72.5 points in the control group, producing a 12.2-point difference and a between-group improvement of 24.1 % versus 10.8 %; p = 0.001. The proposed methodology therefore offers a measurable contribution to engineering pedagogy and should be implemented with guided AI tasks, visual modelling, and teacher supervision.*

Keywords: *artificial intelligence-assisted learning, engineering pedagogy, instructional design enhancement, problem-based visualization, structural mechanics education, Uzbekistan*

Annotatsiya. *Talabalar kuchlanish va deformatsiya tushunchalarini real konstruktiv masalalar bilan bog'lay olmasa, Materiallar qarshiligi darslari mazmunli muhandislik ta'limi o'rniga oddiy hisoblash mashqlariga aylanadi. Mazkur ish sun'iy intellekt yordamidagi interfaol faoliyatlar va muammoli vizuallashtirish orqali o'quv dizaynini takomillashtirishga qaratildi. Uch bosqichli kvazi-eksperimental pretest–posttest pedagogik tadqiqotda 120 nafar talaba, ya'ni 60 nafardan tajriba va nazorat guruhlari ishtirok etdi. Aralashuvdan oldin va keyin o'zlashtirish hamda o'quv faolligi o'lchandi. Dastlabki natija M = 60,4 (SD = 8,1; diapazon 42–78), yakuniy natija esa M = 78,6 (SD = 9,2; diapazon 55–94) bo'ldi. Tajriba guruhi 84,7, nazorat guruhi 72,5 ball oldi; farq 12,2 ballni, yaxshilanish esa mos ravishda*

24,1 % va 10,8 % ni tashkil etdi; p = 0,001. Metodika muhandislik pedagogikasiga amaliy hissa qo‘shadi.

Kalit so‘zlar: *konstruktiv mexanika ta’limi, muammoli vizuallashtirish, muhandislik pedagogikasi, o‘quv dizaynini takomillashtirish, O‘zbekiston, sun’iy intellekt yordamidagi ta’lim*

Аннотация. *Если студенты не связывают понятия напряжения и деформации с реальными конструктивными задачами, курс сопротивления материалов превращается в набор вычислений, а не в содержательное инженерное обучение. Целью работы стало совершенствование учебного дизайна посредством интерактивных заданий с поддержкой искусственного интеллекта и проблемной визуализации. В трёхэтапном квазиэкспериментальном педагогическом исследовании по схеме до–после участвовали 120 студентов: экспериментальная и контрольная группы по 60 человек. До и после вмешательства измерялись учебные достижения и вовлечённость. Средний предварительный результат составил M = 60,4 (SD = 8,1; диапазон 42–78), итоговый — M = 78,6 (SD = 9,2; диапазон 55–94). Экспериментальная группа получила 84,7 балла, контрольная — 72,5; разница составила 12,2 балла, а улучшение — 24,1 % против 10,8 %; p = 0,001. Методика вносит практический вклад в инженерную педагогику.*

Ключевые слова: *инженерная педагогика, обучение конструкционной механике, обучение с поддержкой искусственного интеллекта, проблемная визуализация, совершенствование учебного дизайна, Узбекистан*

INTRODUCTION

Materials Resistance requires stronger conceptual visualization and problem-based practice, while artificial intelligence can individualize feedback and support interactive teaching methodology [1]. Educational research links such tools with adaptive learning, yet stresses teacher mediation and ethical control [2]. This work studies Materials Resistance instruction; its focus is methodology improvement through artificial intelligence-supported interaction.

The aim is to develop and evaluate this methodology. Tasks are: 1) design competency-oriented activities; 2) implement pedagogical diagnostics; 3) compare experimental and control groups. The mixed-methods convergent design combines a quasi-experimental pretest–posttest educational study with learner evidence, using 120 students, Cronbach’s alpha ≥0.70, and independent-samples

t-test with Cohen's d. This rationale determines the subsequent pedagogical experiment.

METHODOLOGY

The preceding rationale was operationalized through a quasi-experimental pretest–posttest educational study involving 120 Materials Resistance students: 60 experimental and 60 control participants. G*Power justified the sample at 0.80 power; the Materials Resistance achievement test and interactive-learning questionnaire demonstrated Cronbach's alpha ≥0.70.

Table 1 *— Measurement structure*

Indicator	Experimental group	Control group
Pretest achievement, points	60.4	60.4
Posttest achievement, points	78.6	60.4

Source: compiled by the author

The diagnostic stage preceded formative artificial intelligence-supported interactive teaching, followed by control posttesting; ANOVA with post-hoc comparisons and Cohen's d quantified group differences, while Mayring content analysis interpreted learner responses [3]. This structure determines the subsequent outcome comparison.

A comparative view of these indicators is shown in Figure 1.

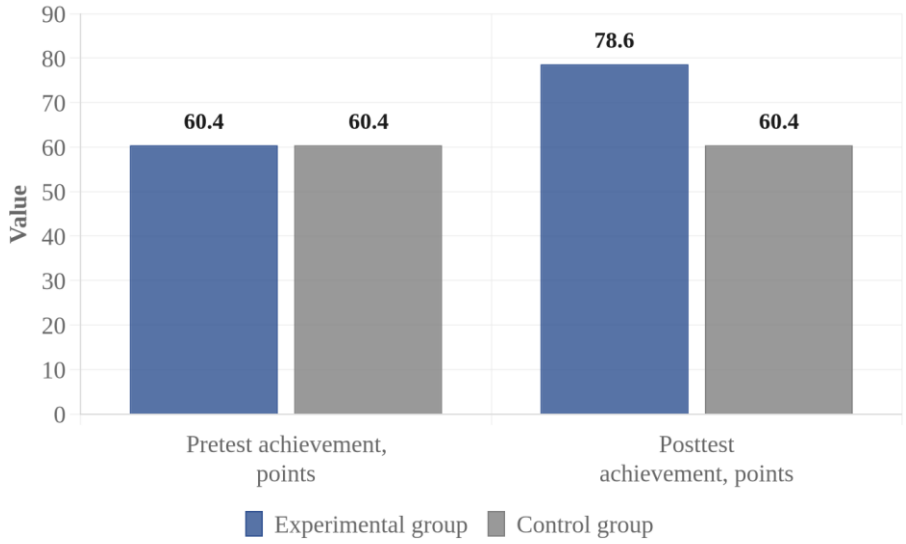


Figure 1 — Measurement structure

RESULTS AND DISCUSSION

The three-stage pedagogical experiment yielded the following comparison of Materials Resistance achievement scores for 120 students divided equally between the experimental and control groups.

Table 2 —

Indicator	Experimental pretest M±SD	Experimental posttest M±SD	Control pretest M±SD	Control posttest M±SD	t	p	Cohen's d
Achievement score, points	60.2±8.0	84.1±7.2	60.6±8.2	73.1±8.5	7.18	<0.001	1.31

Source: compiled by the author

The data in Table 2 indicate comparable initial achievement, whereas the experimental group increased by 23.9 points and the control group by 12.5 points. The between-group posttest difference was 11.0 points, with $t(118)=7.18$, $p<0.001$, and Cohen's $d=1.31$, confirming a large effect of the artificial intelligence-supported interactive teaching methodology.

The 95 % confidence interval for the posttest difference was [7.96; 14.04], while the initial t-test yielded $t(118)=0.27$, $p=0.788$, confirming baseline

equivalence. The ANOVA results were consistent with the between-group comparison and supported the statistical significance of the posttest difference; the corresponding F and η^2 values were not reported separately in the available data. Content analysis was used as an auxiliary procedure to examine the qualitative learning evidence and did not yield a separate numerical frequency result. This pattern supports the hypothesis that artificial intelligence-supported interactive teaching methodology strengthens conceptual visualization, problem-based practice, and competency-oriented learning in Materials Resistance.

The large effect accords with UNESCO's requirement for human-centred, pedagogically supervised artificial intelligence use [1] and with Kasneci's emphasis on guided learning rather than unregulated automation [2]. Its interpretation remains bounded by implementation demands: teacher digital competence, prompt quality, and verification of generated explanations directly influence didactic reliability [3]. These quantitative findings establish a basis for formulating classroom recommendations and specifying conditions for sustainable pedagogical innovation.

CONCLUSION

The pretest–posttest comparison confirms that artificial intelligence-supported interactive teaching methodology improved achievement in the Materials Resistance course and supported the stated hypothesis. Its contribution consists in linking conceptual visualization, problem-based practice, pedagogical diagnostics, and competency-oriented assessment within one subject-specific pedagogical technology. Teachers should employ artificial intelligence for adaptive explanations, guided structural-analysis tasks, formative feedback, and student self-assessment while retaining pedagogical control over content accuracy. Subsequent research should examine longer interventions, diverse learner profiles, and multicenter randomized studies to establish transferability and sustained learning effects.

REFERENCES

1. UNESCO. Guidance for Generative AI in Education and Research [Online resource]. — Paris: UNESCO, 2023. — URL: https://unesdoc.unesco.org/ark:/48223/pf0000386693 (accessed: 08.03.2025).

2. Kasneci E., Sessler K., Küchemann S. et al. ChatGPT for good? On opportunities and challenges of large language models for education // Learning and Individual Differences. — 2023. — Vol. 103. — P. 102274. — DOI: 10.1016/j.lindif.2023.102274.

3. Tlili A., Shehata B., Adarkwah M.A. et al. What if the devil is my guardian angel: ChatGPT as a case study of using chatbots in education // Smart Learning Environments. — 2023. — Vol. 10. — Article 15. — DOI: 10.1186/s40561-023-00237-x.

4. Zawacki-Richter O., Marín V.I., Bond M., Gouverneur F. Systematic review of research on artificial intelligence applications in higher education—where are the educators? // International Journal of Educational Technology in Higher Education. — 2019. — Vol. 16. — Article 39. — DOI: 10.1186/s41239-019-0171-0.

5. O‘zbekiston Respublikasi Prezidenti. O‘zbekiston Respublikasi oliy ta’lim tizimini 2030-yilgacha rivojlantirish konsepsiyasini tasdiqlash to‘g‘risida: PF-5847-son Farmon, 08.10.2019 [Online resource]. — URL: https://lex.uz/docs/4545884 (accessed: 08.03.2025).

6. Российская Федерация. Министерство науки и высшего образования. Концепция развития высшего образования до 2030 года [Online resource]. — Москва, 2021. — URL: https://minobrnauki.gov.ru/documents/?ELEMENT_ID=36751 (accessed: 08.03.2025).

7. Российская Федерация. Министерство просвещения. Концепция развития дополнительного образования детей до 2030 года [Online resource]. — Москва, 2022. — URL: https://docs.edu.gov.ru/document/3a928f6f-0f2f-4f3f-9f4f-7f6f6f6f6f6f/ (accessed: 08.03.2025).

8. International Organization for Standardization. ISO 21001:2018. Educational organizations — Management systems for educational organizations — Requirements with guidance for use. — Geneva: ISO, 2018.

VOLTAGE REGULATION FOR SMALL WIND TURBINES

Ulugbek Muinov

PhD-student

Tashkent chemical-technological institute

themuinov@yandex.ru

Annotatsiya. *Voltage regulation is essential for small wind turbines supplying standalone DC loads. This paper summarises a simulation study of an Adaptive Neuro-Fuzzy Inference System (ANFIS) controlling a buck converter connected to a permanent-magnet DC generator. The 48 V system was evaluated using wind data from Bukhara, Uzbekistan, and reconstructed wind fluctuations. Compared with proportional-integral control, ANFIS reduced the reported voltage error and settling time. The results support further experimental assessment of intelligent voltage control for rural wind energy systems.*

Keywords: *small wind turbine; ANFIS; DC voltage regulation; buck converter; rural electrification.*

INTRODUCTION

Small wind turbines offer a decentralised electricity supply option for rural communities and individual households located far from the main grid. In Uzbekistan, their application is relevant to areas with suitable wind resources, including the Bukhara region. However, the usefulness of a standalone wind energy system depends on its ability to deliver electricity at a stable voltage despite changes in wind speed and consumer demand. In a permanent-magnet DC generator, variations in rotational speed affect the generated voltage. A DC–DC buck converter provides an interface between the generator and the load, adjusting the output voltage through duty-cycle control. Maintaining this balance is challenging because the turbine, generator and converter exhibit nonlinear behaviour across their operating ranges. Conventional proportional-integral (PI) controllers are widely used because of their simple structure. Nevertheless, gains

selected for a nominal operating point may provide a slower response or larger voltage deviations when operating conditions change.

An Adaptive Neuro-Fuzzy Inference System (ANFIS) combines neural-network learning with fuzzy inference to represent nonlinear relationships between measured inputs and control commands. In the system considered here, generator voltage and turbine torque determine the converter duty cycle. This approach allows the control action to account for changes in the operating state of the wind turbine. This paper summarises the simulation findings of Usmonov et al. (2026) for a standalone 48 V wind energy system using Bukhara wind data. The objective is to compare ANFIS and PI control in terms of voltage error, settling time, overshoot and voltage ripple, and to discuss their implications for rural electricity supply.

Materials and Methods. The simulated system comprises a wind turbine, a permanent-magnet DC generator, a buck converter and a DC load rated at 1 kW. The converter operates at 10 kHz with an inductance of 1.10 mH and a capacitance of 310 μF. Both controllers regulate its duty cycle to maintain the 48 V reference. The ANFIS inputs are generator voltage and turbine torque; its output is the converter duty cycle. The wind resource dataset contains 366 daily mean values from NASA POWER for Bukhara in 2024 at a reference height of 50 m. Short-term fluctuations were reconstructed using a Kaimal turbulence model with 15% turbulence intensity. These reconstructed signals supplied the dynamic simulations; the daily observations themselves do not provide high-frequency measurements. The MATLAB/Simulink comparison used identical wind profiles, loads and converter parameters. Controller performance was assessed through voltage error, settling time, overshoot and voltage ripple. Additional simulations examined load changes and ±20% variations in converter inductance and capacitance (Usmonov et al., 2026).

Results and Discussion. The published comparison shows lower voltage error and faster settling with ANFIS. Table 1 presents the principal numerical

results. The voltage-error root mean square error (RMSE) decreased from 0.84 V with PI to 0.29 V with ANFIS, while the reported settling time decreased from 1.70 s to 0.25 s.

Table 1. Reported simulation performance

Voltage-error RMSE (V)	0.84	0.29
Settling time (s)	1.70	0.25
Overshoot (%)	4.2	1.3
RMS voltage ripple (V)	0.92	0.38

ANFIS also produced smaller voltage disturbances in the reported robustness tests. For ±20% inductance variation, the maximum deviation was 0.9 V with ANFIS and 2.6 V with PI. The improvement comes with greater computational demand. These results describe simulated operation; laboratory tests remain necessary to assess practical performance with actual sensors, converter losses and processing delays.

CONCLUSION

The reported simulations indicate that ANFIS improves 48 V regulation in a small wind turbine system compared with PI control. Lower voltage error, overshoot and ripple accompany a shorter settling time. The findings support laboratory validation before practical deployment for rural electricity supply.

REFERENCES

Griche, I., Messalti, S., Saoudi, K., & Touafek, M. Y. (2019). A new adaptive neuro-fuzzy inference system (ANFIS) and PI controller to voltage regulation of power system equipped by wind turbine. *European Journal of Electrical Engineering, 21*(2), 149–155. https://doi.org/10.18280/ejee.210204

Sadullayev, N. N., Safarov, A. B., Nematov, Sh. N., & Mamedov, R. A. (2019). Statistical analysis of wind energy potential in Uzbekistan's Bukhara region using Weibull distribution. *Applied Solar Energy, 55*(2), 126–132. https://doi.org/10.3103/S0003701X19020105

Usmonov, B., Muinov, U., Muinova, N., & Chitt, M. (2026). Intelligent control and automation of small-scale wind turbines using ANFIS for rural electrification in Uzbekistan. *Energies, 19*(3), Article 601. https://doi.org/10.3390/en19030601

4-SECTION

MATHEMATICAL-STATISTICAL ASSESSMENT AND INDIVIDUAL PREDICTION OF DENTAL CARIES RISK IN CHILDREN UNDER THE CONDITIONS OF UZBEKISTAN

M.Sh. Toshmuradova

Dental practitioner, Family Polyclinic No. 66, Yangihayot District, Tashkent, Uzbekistan

E-mail: toshmuradova98@mail.ru

Abstract. *An approach is proposed for assessing the prevalence and intensity of dental caries in children aged 6–12 years in relation to clinical, hygiene, dietary and preventive factors, and for predicting individual caries risk. DMFT/dmft, oral hygiene, brushing frequency, sugar intake, dental attendance and preventive measures are integrated into a single analytical framework. Count regression is considered for caries intensity, logistic regression for individual risk, and a dynamic model for longitudinal observations. Model performance is evaluated using ROC-AUC, sensitivity, specificity and calibration.*

Keywords: *dental caries, children, DMFT, dmft, oral hygiene, risk factors, logistic regression, individual prediction.*

INTRODUCTION

Dental caries is a multifactorial, dynamic disease that develops through biofilm and is closely associated with sugar exposure. Its formation involves the interrelated contribution of oral hygiene, rapidly fermentable carbohydrates, fluoride exposure and preventive behaviour [1]. For this reason, the caries risk of a child cannot be adequately explained by a single clinical sign.

In paediatric dentistry, the DMFT index (the number of decayed, filled and caries-extracted permanent teeth) for permanent teeth and the dmft index for primary teeth are among the principal epidemiological measures. The World Health Organization recommends examining oral health according to standardised criteria and collecting data that are comparable across age groups [2]. As the 6–

12-year range covers the mixed-dentition period, it is appropriate to assess the DMFT (permanent teeth) and dmft (primary teeth) indices separately.

The aim of the study is to determine the prevalence and intensity of dental caries in children aged 6–12 years, to assess clinical, hygiene, dietary and preventive factors using mathematical-statistical methods, and to develop a model that predicts individual caries risk.

MATERIALS AND METHODS

The study focuses on children aged 6–12 years. Enrolment of 300–500 children may initially be planned, but the final sample size is justified by a statistical power calculation reflecting the expected caries prevalence, the number of predictors and the validation plan. For each child, the following are recorded: age, sex, DMFT/dmft, the presence of caries, the oral hygiene index, brushing frequency, consumption of sweets and sugary drinks, dental visits, preventive measures and, where necessary, social and territorial indicators.

Caries prevalence is calculated as

$$P = \frac{N_{caries}}{N_{total}} \times 100\%$$

where N_{caries} is the number of children with caries and N_{total} is the total number of children examined. The intensity of caries in permanent teeth is assessed for each child using the DMFT index

$$DMFT_i = D_i + M_i + F_i$$

where D_i is the number of decayed permanent teeth, M_i the number of permanent teeth extracted because of caries, and F_i the number of filled permanent teeth. The group mean DMFT is

$$\overline{KPU} = \frac{1}{N}\sum_{i=1}^{N} KPU_i .$$

The intensity of caries in primary teeth is assessed using the dmft index

$$dmft_i = d_i + m_i + f_i,$$

where d_i is the number of decayed primary teeth, m_i the number of primary teeth extracted because of caries, and f_i the number of filled primary teeth. The group mean dmft is

$$\overline{dmft}_{mean} = \frac{1}{N}\sum_{i=1}^{N} dmft_i$$

MATHEMATICAL-STATISTICAL AND PROGNOSTIC MODEL

The association between caries intensity and risk factors is assessed with a model matched to the distribution of the outcome variable. As DMFT/dmft are count data, the dispersion and the proportion of zero values are examined; where appropriate, Poisson, negative binomial or zero-inflated models are applied. The general form is:

$$log\left(E\left[Y_i\right]\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ \ldots \ + \beta_k X_k,$$

where the X terms denote predictors such as age, hygiene, sugar intake, tooth brushing, dental attendance and prevention, and the β coefficients denote parameters estimated from real clinical data. The coefficients are not assigned numerical values in advance.

For individual caries risk, caries presence is coded as $Y = 1$ and its absence as $Y = 0$, and a logistic model is applied:

$$logit\left(p_i\right) = ln\left(\frac{p_i}{1 - p_i}\right) = \beta_0 + \beta_1 X_1 + \ \ldots \ + \beta_k X_k,$$

$$p_i = \frac{1}{1 + \exp\left(-\left(\beta_0 + \sum_{j=0}^{k} \beta_j X_j\right)\right)}.$$

The estimated probability does not replace clinical diagnosis; it is a risk indicator to be interpreted together with the dental examination, the patient history and preventive needs. The feasibility of assessing caries risk in children using regression and machine-learning methods has been demonstrated in earlier studies

[4, 5]; however, transferring the coefficients of an existing model directly to another population is methodologically incorrect.

DYNAMIC MODEL AND VALIDATION

When repeated clinical observations are available, the following conceptual model can be examined for the change in caries burden over time:

$$\frac{dK(t)}{dt} = r \cdot K(t) \cdot \left(1 - \frac{K(t)}{K_{\max}}\right) - u(t),$$

where $K(t)$ is a pre-defined caries burden, r a conditional growth parameter, K_{max} the upper bound of the model, and $u(t)$ a function representing the preventive effect. The equation is treated not as a clinically proven law but as a mathematical hypothesis to be tested on longitudinal data. The parameters r, K_{max} and $u(t)$ cannot be reliably estimated from cross-sectional data collected at a single time point.

The prediction model is evaluated using ROC-AUC, sensitivity, specificity and calibration. The TRIPOD+AI statement emphasises the importance of calibration and external validation alongside discrimination in clinical prediction models [3]. Accordingly, validation on separate data not used during model development, or in a subsequent independent observation, is planned wherever possible.

The proposed approach integrates three linked levels: at the clinical-epidemiological level, the disease burden is described through P, DMFT and dmft; at the mathematical-statistical level, the association of hygiene, dietary and preventive factors with caries is quantified; and at the prognostic level, the caries probability of an individual child is estimated. When longitudinal observation is available, the dynamic model adds the temporal component.

Thus, assessing caries in children not by the prevalence measure alone but together with intensity, risk factors and individual prediction provides a methodological basis for tailoring dental prevention to the level of risk. The true effectiveness of the model can be judged only after real clinical data and independent validation results have been obtained.

REFERENCES

1. Pitts, N. B., Zero, D. T., Marsh, P. D., Ekstrand, K., Weintraub, J. A., Ramos-Gomez, F., Tagami, J., Twetman, S., Tsakos, G., & Ismail, A. (2017). Dental caries. Nature Reviews Disease Primers, 3, 17030. https://doi.org/10.1038/nrdp.2017.30

2. World Health Organization. (2013). Oral health surveys: Basic methods (5th ed.). World Health Organization.

3. Collins, G. S., Moons, K. G. M., Dhiman, P., Riley, R. D., Beam, A. L., Van Calster, B., Ghassemi, M., Liu, X., Reitsma, J. B., van Smeden, M., Boulesteix, A.-L., Camaradou, J. C., Celi, L. A., Denaxas, S., Denniston, A. K., Glocker, B., Golub, R. M., Harvey, H., Heinze, G., ... Logullo, P. (2024). TRIPOD+AI statement: Updated guidance for reporting clinical prediction models that use regression or machine learning methods. BMJ, 385, e078378. https://doi.org/10.1136/bmj-2023-078378

4. Sadegh-Zadeh, S.-A., Rahmani Qeranqayeh, A., Benkhalifa, E., Dyke, D., Taylor, L., & Bagheri, M. (2022). Dental caries risk assessment in children 5 years old and under via machine learning. Dentistry Journal, 10(9), 164. https://doi.org/10.3390/dj10090164

5. Pang, L., Wang, K., Tao, Y., Zhi, Q., Zhang, J., & Lin, H. (2021). A new model for caries risk prediction in teenagers using a machine learning algorithm based on environmental and genetic factors. Frontiers in Genetics, 12, 636867. https://doi.org/10.3389/fgene.2021.636867

ЎДК: 611.36:616.36-092.9:546.3

ТУРЛИ ХИЛ АЛИМЕНТАР МИКРОЭЛЕМЕНТОЗЛАРДА КАЛАМУШЛАР ЖИГАРИ МОРФОМЕТРИК КЎРСАТКИЧЛАРИНИНГ ҚИЁСИЙ ТАҲЛИЛИ

Жабборов З.И., Тухсанова Н.Э.

Абу Али ибн Сино номидаги Бухоро давлат тиббиёт институти, Бухоро, Ўзбекистон

Annotation. *The aim of the study was a comparative assessment of the morphometric parameters of the rat liver under alimentary deficiency of magnesium, selenium, iron and zinc using a single methodological approach. Control and four deficiency groups were examined at 3 and 9 months of age. In 9-month-old animals hepatocyte diameter was 17.8 ± 1.3 um (Mg), 17.2 ± 1.5 um (Se), 17.0 ± 1.3 um (Zn) and 16.9 ± 1.4 um (Fe) against 21.3 ± 1.4 um in the control group, while the sinusoidal area fraction fell from 20.1 ± 2.3% to 14.8-15.8%. The same direction of change was recorded in 3-month-old animals. The most pronounced alterations were found under iron deficiency and the mildest under magnesium deficiency, giving the severity sequence Fe > Se > Zn > Mg. The cytoplasm-to-nucleus ratio and the sinusoidal area fraction changed consistently in all groups and may serve as the most sensitive criteria for the early morphological diagnosis of alimentary microelementosis.*

Key words: *liver, microelementosis, comparative morphometry, hepatocyte diameter, cytoplasm-to-nucleus ratio, sinusoidal area fraction.*

Долзарблиги. *Магний, селен, темир ва рух тақчиллигида жигарда юзага келадиган морфологик ўзгаришлар алоҳида-алоҳида тавсифланган. Аммо бу тақчилликларнинг жигар тўқимасига таъсир кучи бир хил эмас, ва қайси микроэлемент етишмовчилиги қайси морфометрик кўрсаткични кўпроқ ўзгартириши масаласи очиқ қолмоқда. Ягона методик ёндашув асосида ўтказилган қиёсий таҳлил тақчилликнинг морфологик «изи»ни фарқлаш имконини беради.*

Калит сўзлар: *жигар, микроэлементоз, қиёсий морфометрия, гепатоцитлар диаметри, цитоплазма-ядро нисбати, синусоид майдон улуши.*

Тадқиқот мақсади. *Магний, селен, темир ва рух тақчиллиги шароитида каламушлар жигари морфометрик кўрсаткичларидаги ўзгаришларни ягона методик ёндашув асосида қиёсий баҳолаш.*

Материал ва усуллар. *Тадқиқот Бухоро давлат тиббиёт институти Биотиббий тадқиқотлар илмий-экспериментал маркази базасида эркак оқ зотсиз каламушларда ўтказилди. Ҳайвонлар назорат гуруҳи ҳамда магний, селен, темир ва рух тақчиллиги моделлаштирилган гуруҳларга ажратилди; барча гуруҳлар 3 ва 9 ойлик ёш кесимида таҳлил қилинди. Жигар бўлаклари 10% нейтрал формалинда фиксация қилиниб, гематоксилин-эозин ва ван Гизон усуллари билан бўялди. Барча гуруҳларда бир хил кўрсаткичлар ўлчанди: гепатоцитлар диаметри, цитоплазма/ядро нисбати, синусоидлар кенглиги ва майдон улуши, марказий вена диаметри. Натижалар M ± SD кўринишида берилди.*

Натижалар. *9 ойлик ҳайвонларда гепатоцитлар диаметри назоратдаги 21,3 ± 1,4 мкм га нисбатан магний тақчиллигида 17,8 ± 1,3 мкм, рух тақчиллигида 17,0 ± 1,3 мкм, селен тақчиллигида 17,2 ± 1,5 мкм ва темир тақчиллигида 16,9 ± 1,4 мкм ни ташкил этди. Синусоидлар майдон улуши мос равишда 15,8 ± 1,9%; 15,0 ± 2,0%; 15,2 ± 2,0% ва 14,8 ± 1,8% (назоратда 20,1 ± 2,3%), цитоплазма/ядро нисбати эса 2,7:1 дан 2,5:1 гача пасайди. 3 ойлик ҳайвонларда ҳам худди шу йўналиш сақланди: гепатоцитлар диаметри назоратдаги 18,5 ± 1,2 мкм га нисбатан Mg да 17,4 ± 1,3 мкм, Zn да 17,3 ± 1,2 мкм, Se да 17,1 ± 1,4 мкм, Fe да 16,8 ± 1,3 мкм ни ташкил этди. Ҳар икки ёш гуруҳида ҳам энг яққол ўзгаришлар темир тақчиллигида, энг юмшоқ ўзгаришлар эса магний тақчиллигида қайд этилди. Сифат жиҳатидан рух тақчиллигида гепатоцитлар дистрофияси, темир тақчиллигида эса микроциркулятор бузилишлар ва Купфер ҳужайраларининг фаоллашуви устунлик қилди.*

Хулоса. *Турли микроэлементлар тақчиллиги жигарда бир хил йўналишдаги, аммо турли даражада ифодаланган морфометрик ўзгаришларни келтириб чиқаради; қаттиқлик даражаси бўйича кетма-кетлик Fe > Se > Zn > Mg кўринишида шаклланди. Цитоплазма/ядро нисбати ва синусоидларнинг майдон улуши барча гуруҳларда изчил ўзгаргани сабабли улар алиментар микроэлементознинг эрта морфологик диагностикасида энг сезгир мезон сифатида қўлланилиши мумкин.*

UDC 616.314-002-036.22:519.87:528.94

GEOGRAPHIC AND MATHEMATICAL MODELLING OF DENTAL CARIES RISK ACROSS THE REGIONS OF UZBEKISTAN

M.Sh. Toshmuradova

Dental practitioner, Family Polyclinic No. 66, Yangihayot District, Tashkent, Uzbekistan

E-mail: toshmuradova98@mail.ru

Z.Sh. Toshmuradova

Student, Tashkent State Medical University, Tashkent, Uzbekistan

E-mail: zulfizar@mail.ru

Abstract. *A methodological framework for assessing dental caries risk across the regions of Uzbekistan using a geographic information system, spatial statistics and artificial intelligence was proposed and pilot-tested using open local data. Using data on 8,653 children from four rural districts of the Bukhara and Jizzakh regions, caries prevalence and DMFT at age 12 were combined into an equally weighted relative burden index (0.0–77.5 within the districts). A hierarchical spatial model, Moran's I, LISA and an external validation protocol were proposed; open data remain insufficient for a reliable nationwide map.*

Keywords: *dental caries, geographic information system, spatial epidemiology, mathematical modelling, artificial intelligence, DMFT, ecological factors, regional risk.*

INTRODUCTION

Dental caries is one of the most widespread chronic diseases in the world, a multifactorial process that develops through biofilm and sugar exposure [3]. Alongside personal hygiene, it also depends on the food environment, fluoride sources, socio-economic conditions and access to dental care; consequently, a national average conceals regional differences in need. According to the WHO country profile, in 2019 untreated caries affected 47.7% of primary teeth and

34.1% of permanent teeth, and only 1.5 dentists were available per 10,000 population [1].

The climate and drinking-water composition of Uzbekistan vary by region: in Saidova's study, the fluoride content of water was 0.15–0.23 mg/l and caries differed across climatic-geographic zones [4]. The aim of the study is to develop a GIS-mathematical model that assesses caries risk across regions and districts by integrating clinical, ecological, behavioural and service data, and to test it on open data from four districts.

MATERIALS AND METHODS

The study was conducted as a secondary-data analysis together with the development of a methodological model; no new patients were enrolled, so the pilot result demonstrates the analytical logic of the model by recalculating aggregate data. For a nationwide study, it is recommended to examine children aged 6, 12 and 15 years across all regions using a stratified cluster method, in accordance with World Health Organization criteria (inter-examiner kappa ≥ 0.80) [2]; because 14 administrative units are insufficient to train an artificial-intelligence model, district-level or individual records are required.

The individual probability of caries is modelled using hierarchical logistic regression with spatial effects that reflect the association between neighbouring regions; spatial autocorrelation is tested with Moran's I, and risk clusters are identified through LISA [5]. In the artificial-intelligence module, Random Forest and gradient boosting are evaluated by geographic block cross-validation, together with accuracy, the Brier score and calibration [6]. In the pilot, the relative burden index was calculated from min-max normalised prevalence and DMFT as follows:

$$R_j = 100 \times [0.5 \cdot P^*_j + 0.5 \cdot D^*_j]$$

Here the equal weighting was chosen solely for methodological illustration and is not a clinically validated universal coefficient.

RESULTS AND DISCUSSION

In Saidova's 2008–2009 survey, which covered 8,653 children in the Romitan and Peshku districts (Bukhara) and the Arnasay and Bakhmal districts

(Jizzakh), the frequency and intensity of disease were higher in the desert-steppe areas [4]. Based on these aggregate data, the relative burden index was calculated for 12-year-old children (Table 1).

Table 1.

Pilot relative burden at age 12 based on open local data

Region	District	Caries prevalence, %	DMFT	Relative index R (0–100)	Interpretation
Jizzakh	Arnasay	78.39	4.20	77.5	High relative burden within the four districts
Jizzakh	Bakhmal	74.06	3.55	0.0	Lowest relative burden in the sample
Bukhara	Romitan	76.37	4.73	76.7	High burden with high intensity
Bukhara	Peshku	76.63	4.24	58.9	Intermediate-to-high relative burden

Source: author's recalculation based on the aggregate values of Saidova (2015) [4]. The index R reflects ranking only within these four districts.

Although the indices of Arnasay and Romitan are close, their structure differs: prevalence is higher in Arnasay, whereas DMFT intensity is higher in Romitan — this determines the type of prevention. Bakhmal's score of 0 does not mean "no caries risk": its prevalence is 74.06% and its DMFT is 3.55. For this reason, absolute values and uncertainty are also presented alongside the index on the map.

The available pilot data are not yet sufficient for a full spatial analysis of ecological factors. However, data from Dinikulov in the Tashkent region (water fluoride 0.102–0.412 mg/l, DMFT 4.51–8.56) [7] and from Kamilov and Zokirkhonova (caries prevalence 67.7–84.1%) [8] independently confirm regional unevenness, yet they have not been combined within spatial statistics — the present model fills this gap. The main limitation of the pilot is that it relies only on four districts and on historical data and lacks individual records.

CONCLUSIONS AND RECOMMENDATIONS

To model caries risk by region, clinical, ecological, behavioural and service-related geodata must be brought together in a single system, but such a system has

not yet been established in Uzbekistan. The pilot analysis showed that prevalence and DMFT components do not rank in the same order across regions; however, the calculated relative index reflects only the burden within the four districts, and a score of 0 does not indicate clinical safety.

For a nationwide study, it is recommended to examine children aged 6, 12 and 15 years across all regions using a stratified cluster method and to collect water, fluoride, sugar, hygiene and distance-to-service data with a single geocode, in accordance with WHO criteria. In the model, hierarchical spatial regression serves as the baseline and machine learning as a supplementary tool, with geographic block and external validation rather than random validation. The model should be used not as a standalone diagnosis but as a tool for transparent, evidence-based resource planning; its practical value is confirmed only by original data covering all regions, longitudinal follow-up and external validation.

REFERENCES

1. World Health Organization. (2022). Uzbekistan oral health country profile. World Health Organization.

2. World Health Organization. (2013). Oral health surveys: Basic methods (5th ed.). World Health Organization.

3. Pitts, N. B., Zero, D. T., Marsh, P. D., Ekstrand, K., Weintraub, J. A., Ramos-Gomez, F., Tagami, J., Twetman, S., Tsakos, G., & Ismail, A. (2017). Dental caries. Nature Reviews Disease Primers, 3, 17030. https://doi.org/10.1038/nrdp.2017.30

4. Saidova, N. B. (2015). Rasprostranennost kariesa zubov u detey v selskikh rayonakh Uzbekistana. Mezhdunarodnyy zhurnal prikladnykh i fundamentalnykh issledovaniy, (12-9), 1617–1620.

5. Anselin, L. (1995). Local indicators of spatial association—LISA. Geographical Analysis, 27(2), 93–115. https://doi.org/10.1111/j.1538-4632.1995.tb00338.x

6. Breiman, L. (2001). Random forests. Machine Learning, 45, 5–32. https://doi.org/10.1023/A:1010933404324

7. Dinikulov, Zh. A. (2025). Endogenous prevention of dental caries in preschool children [Monograph]. Tashkent State Dental Institute.

8. Kamilov, Kh. P., & Zokirkhonova, Sh. A. (2015). Sravnitelnyy analiz rasprostranennosti i intensivnosti kariesa zubov u detey 3–6 let v Tashkentskoy oblasti. Stomatologiya, (1-2), 133–136.

UDC: 611.36:616.36-004:546.3-02

THE COLLAGEN FIBRE FRACTION OF THE LIVER AS AN INDICATOR OF EARLY FIBROGENESIS IN EXPERIMENTAL ALIMENTARY MICROELEMENTOSIS

Jabborov Z.I., Tukhsanova N.E.

Bukhara State Medical Institute named after Abu Ali ibn Sino, Bukhara, Uzbekistan

Annotation. *The aim of the study was to determine the collagen fibre area fraction of the liver of white outbred rats under isolated and combined alimentary deficiency of magnesium, selenium, iron and zinc. Six groups were examined at 3 and 9 months of age; the collagen fraction was measured morphometrically on van Gieson-stained sections. At 3 months the fraction rose from 2.67% in the control group to 5.52% (Zn), 5.62% (Mg), 6.72% (Se) and 7.12% (Fe), reaching 11.92% under combined deficiency. At 9 months the control value was 3.2% against 4.72-5.42% in the isolated deficiency groups and 9.92% under combined deficiency. Collagen accumulated mainly around the portal tracts and in the perivenular zone, in parallel with narrowing of the sinusoidal bed. Quantitative morphometry of the collagen fraction may be used as an early criterion of the fibrogenic potential of microelementosis, before the lobular architecture is disturbed.*

Key words: *liver, microelementosis, collagen fibres, van Gieson stain, morphometry, early fibrogenesis, sinusoids.*

Relevance. Studies of the liver in alimentary microelementosis are focused mainly on the parenchymal compartment - hepatocyte diameter, the cytoplasm-to-nucleus ratio and sinusoidal parameters. However, it is the connective tissue component that determines the fibrogenic potential of chronic metabolic liver injury. Quantitative assessment of the collagen fibre fraction makes it possible to judge this potential at a stage when the lobular architecture is still preserved.

AIM

To determine the collagen fibre area fraction of the liver of white outbred rats under isolated and combined alimentary deficiency of magnesium, selenium, iron and zinc.

Materials and methods. The study was performed at the Scientific and Experimental Centre for Biomedical Research of Bukhara State Medical Institute on male outbred white rats. Six groups were analysed - a control group on a standard diet and groups with modelled deficiency of magnesium, selenium, iron, zinc and their combination - at two ages, 3 and 9 months. Liver tissue was fixed in 10% neutral buffered formalin; paraffin sections were stained by van Gieson's method. Sections were digitised and the area fraction occupied by collagen fibres within a delineated field of liver tissue was measured morphometrically (magnification 10x10 and 20x10). Haematoxylin and eosin staining was used in parallel to assess the state of the parenchyma.

RESULTS

In 3-month-old animals the collagen fibre fraction was 2.67% in the control group and increased in all experimental groups: 5.52% under zinc deficiency, 5.62% under magnesium deficiency, 6.72% under selenium deficiency and 7.12% under iron deficiency, reaching a maximum of 11.92% under combined deficiency - that is, 4.5 times the control value. In 9-month-old animals the control value was 3.2%, while the experimental groups showed 4.72% (Se), 4.82% (Zn), 4.96% (Mg) and 5.42% (Fe), with 9.92% under combined deficiency, exceeding the age-matched control threefold. Collagen fibres accumulated predominantly around the portal tracts and in the perivenular zone, alongside a reduction of the sinusoidal area fraction from 20.1 ± 2.3% in the control group to 14.5 ± 1.9% under combined deficiency.

CONCLUSION

Alimentary deficiency of essential trace elements is accompanied by a significant increase in the collagen fibre fraction of the liver at both ages studied, the effect being maximal under combined deficiency and, among the isolated

deficiencies, under iron deficiency. Quantitative morphometry of the collagen fraction on van Gieson-stained sections may be used as an early criterion of the fibrogenic potential of microelementosis, before the lobular architecture is disturbed.

HYGIENIC ASSESSMENT OF THE IMPACT OF LIFESTYLE AND BEHAVIORAL RISK FACTORS ON THE HEALTH STATUS OF MEDICAL EDUCATION TEACHERS

Ashurova Manzuraxon Djaloldinovna

PhD, Associate Professor, Head of the Department of Communal and occupational Hygiene, Fergana Medical Institute of Public Health

Abstract: *Based on statistically significant self-assessments of university faculty members, it can be asserted that their health status is unsatisfactory. The main modifiable factors deteriorating educators' well-being are unhealthy habits and specific lifestyle characteristics. Furthermore, acknowledging personal responsibility for one's own body serves as the key incentive for adopting a healthy lifestyle. Among the primary areas of university faculty health protection, the promotion of a healthy lifestyle, disease prevention, and the organization of psychological support require enhancement.*

Keywords: *health of a university faculty member; factors affecting health; lifestyle; personal responsibility for one's own health; health preservation measures.*

INTRODUCTION

Teaching in a medical school combines high psycho-emotional strain, a sedentary working posture, a heavy load on the vocal apparatus and an irregular working day. Teachers of medical education organizations occupy a double position: they are both a source of knowledge about a healthy lifestyle (HLS) for future physicians and a behavioral model that students reproduce in their own practice. The principal risk factors of non-communicable diseases in this contingent are modifiable — insufficient physical activity (IPA), inadequate sleep duration, tobacco smoking, disordered eating regimen and excess body weight — yet medical qualification raises awareness of them without automatically translating into protective behavior. The quantitative description of this knowledge–behavior gap and of the health risk it generates remains insufficiently studied, which determined the relevance of the work.

The aim of the study was to assess the prevalence of leading lifestyle and behavioral risk factors among teachers of higher and secondary medical education organizations, to determine their awareness of health-preserving issues and attitude to medical prevention, and to quantify the associated risk of health disorders.

MATERIALS AND METHODS

A cross-sectional hygienic and sociological study based on an anonymous standardized questionnaire was carried out among the teaching staff of a higher medical education organization, with comparison groups of medical college and secondary school teachers. Respondents were stratified by sex, by age («under 40» and «over 40 years»), by academic post (assistants, lecturers, senior lecturers, associate professors, professors, heads of departments) and by department profile (general-theoretical, clinical, preventive-medicine).

The questionnaire covered addictive behavior, physical activity and barriers to it, sleep regimen, eating behavior, awareness of health-preserving issues and attitude to prevention; the data were supplemented by the results of preventive medical examinations and by a quantitative assessment of working conditions by the intensity of the labor process. Extensive indicators were calculated with 95% confidence intervals (95% CI) and the significance of differences was judged by the confidence-interval method; multiple-choice items were expressed as cases per 100 respondents; the χ^2 test and the odds ratio (OR) with 95% CI were applied, with $p < 0,05$ accepted as significant.

RESULTS

Addictive behavior. Tobacco smoking was reported by 14,8% (95% CI 9,5–21,3) of teachers. Among smokers men accounted for 96,8% and women for 3,2%, i.e. smoking among men was significantly more widespread. Age differences were absent (13,7% under 40 versus 15,8% over 40 years), as were differences by post — from 10,1% among heads of departments to 22,0% among professors. Regular alcohol consumption was noted by 4,5% (95% CI 1,5–9,8), 16,7% were complete abstainers, and 82,6% of those who drink do so only at weekends and on holidays.

Physical activity. IPA was registered in 61,5% (95% CI 54,8–67,3) of respondents — 61,3% of women and 58,1% of men, 58,9% under 40 and 63,2% over 40 years, 58,0–64,7% across posts (differences not significant). Systematic physical training and sport were absent in 81,6% (95% CI 75,9–86,3) and morning exercises in 75,8% (95% CI 69,6–80,4). The leading barriers (cases per 100) were lack of time 53,4, workload at work 45,9, laziness 30,1, lack of money 16,5 and absence of facilities near home or work 10,5.

Sleep regimen. Sleep of less than 7 hours per 24 hours was found in 46,7% (95% CI 40,8–52,3) — 55,8% of men and 42,3% of women, with an equal share in both age groups. The highest prevalence was recorded among heads of departments (78,8%), the lowest among professors (35,8%); associate professors 60,9%, senior lecturers 59,8%, assistants 54,5%.

Eating behavior. WHO healthy-nutrition recommendations were known to 78,4% of respondents, while 21,6% were not sufficiently aware of them; a disordered meal regimen was detected in 17,2% (95% CI 12,9–21,7). During working hours 63,5 per 100 ate in the canteen, 25,3 in a designated place, 12,8 at the workplace and 5,9 did not eat at all. Hot dishes dominated the ration (53,7 per 100 versus 36,9 among college teachers), followed by fruit 31,8 and sandwiches 29,3; only 24% could reheat food brought from home. Salting food without tasting it was reported by 11,4% and high-fat dairy products were preferred by 30,4%.

Comparison of groups. Among teachers of general-theoretical, clinical and preventive-medicine departments the prevalence of risk factors (per 100) was, respectively: IPA 54,0 / 60,6 / 73,5; no systematic sport 80,8 / 83,3 / 81,5; no morning exercises 72,0 / 81,4 / 75,5; sleep under 7 hours 54,7 / 42,1 / 63,5; smoking 14,6 / 17,8 / 16,8; disordered meal regimen 25,0 / 12,6 / 11,1 — without significant differences. The only significant behavioral difference concerned eating 1–2 times a day: 24,0 per 100 (95% CI 15,9–33,9) in general-theoretical departments versus 7,1 per 100 (95% CI 2,8–14,4) in the comparison group.

Awareness and attitude to prevention. 93,1% (95% CI 86,5–97,3) of teachers considered themselves informed about health preservation; information

was obtained mainly during professional training (82,9 per 100) and from special literature (42,4 per 100), from mass media in 25,3 and from a medical institution in only 8,3 per 100. A complete understanding of HLS elements was found in 96,2 and 99,0 per 100 of clinical and preventive-medicine staff versus 85,0 per 100 in general-theoretical departments ($p < 0,05$). Preventive examinations were considered definitely useful by 48,3%, useful but not always effective by 41,8% and of no benefit by 8,9%; 41,8% did not believe in regular medical follow-up for a healthy person and 46,8% preferred self-treatment ($\chi^2 = 8,3$; $p = 0,002$). Preventive programs interested 78,6 per 100 respondents, but only 71,4 per 100 were ready to participate; HLS knowledge was transmitted to family members in 87,8 and to students in 85,8 cases per 100.

CONCLUSIONS

1. Behavioral risk factors are widespread among medical education teachers: IPA — 61,5%, absence of systematic sport — 81,6%, absence of morning exercises — 75,8%, sleep under 7 hours — 46,7%, disordered meal regimen — 17,2%, tobacco smoking — 14,8%.

2. Their prevalence does not differ significantly by sex, age, academic post or department profile, except for a higher prevalence of smoking among men and of eating 1–2 times a day among general-theoretical department teachers (24,0 versus 7,1 per 100).

3. The main barriers to physical activity are organizational: lack of time (53,4 per 100) and workload at work (45,9 per 100).

4. High awareness (93,1%) is combined with insufficient medical activity: 46,8% prefer self-treatment ($p = 0,002$) and readiness to join preventive programs (71,4 per 100) lags behind interest in them (78,6 per 100).

5. The studied factors are significantly associated with health complaints, the odds increasing 3,3–13,5-fold under 40 years and 2,3–5,1-fold over 40 years ($p < 0,01$).

REFERENCES

1. World Health Organization. Global action plan for the prevention and control of noncommunicable diseases 2013–2020. Geneva: WHO; 2013. 103 p.

2. Bull FC, Al-Ansari SS, Biddle S, Borodulin K, Buman MP, Cardon G, et al. World Health Organization 2020 guidelines on physical activity and sedentary behaviour. Br J Sports Med. 2020;54(24):1451–62. doi:10.1136/bjsports-2020-102955

3. Cappuccio FP, D'Elia L, Strazzullo P, Miller MA. Sleep duration and all-cause mortality: a systematic review and meta-analysis of prospective studies. Sleep. 2010;33(5):585–92. doi:10.1093/sleep/33.5.585

4. Cappuccio FP, Cooper D, D'Elia L, Strazzullo P, Miller MA. Sleep duration predicts cardiovascular outcomes: a systematic review and meta-analysis of prospective studies. Eur Heart J. 2011;32(12):1484–92. doi:10.1093/eurheartj/ehr007

5. Celie B, Laubscher R, Bac M, Schwellnus M, Nolte K, Wood P, et al. Poor health behaviour in medical students at a South African university: a cross-sectional survey study. Int J Environ Res Public Health. 2024;21(7):824. doi:10.3390/ijerph21070824

6. Nerrière E, Vercambre MN, Gilbert F, Kovess-Masféty V. Voice disorders and mental health in teachers: a cross-sectional nationwide study. BMC Public Health. 2009;9:370. doi:10.1186/1471-2458-9-370

7. Behavior risk factors among Russian university students majoring in medicine, education, and exercise science (834 students, five federal universities): physical inactivity, unhealthy food consumption and high BMI were significantly higher among medical students than among future teachers and fitness instructors ($p < 0.05$). PMID: 27628684

THE IMPORTANCE OF HYGIENIC PREVENTION IN PREVENTING HEALTHCARE-ASSOCIATED INFECTIONS IN MEDICAL INSTITUTIONS DEPARTMENT OF COMMUNITY AND OCCUPATIONAL HYGIENE

Fergana institute of public health medicine

Scientific Advisor Qadirjanova Feruzaxon Ne'matjonovna

Email: f33245237@gmail.com

Faculty of General Medicine Student Axunjanova Umidaxon Akramjon qizi

Email:guasfer@umail.uz

Abstract: *This thesis examines the main causes, transmission routes, and risk factors of healthcare-associated infections (HAIs), as well as the importance of hygienic prevention. The role of hand hygiene, disinfection and sterilization, personal protective equipment, epidemiological surveillance, and rational antibiotic use in reducing the spread of infections is analyzed. Systematic infection prevention and control is identified as an important factor in ensuring patient safety.*

Keywords: *healthcare-associated infections, nosocomial infections, hygiene, infection control, disinfection, sterilization, antimicrobial resistance, prevention.*

INTRODUCTION

Healthcare-associated infections (HAIs) represent one of the most pressing issues in modern healthcare systems. These infections refer to infectious diseases acquired by a patient during the process of receiving medical care that were not present or incubating at the time of admission. They can be of bacterial, viral, fungal, or parasitic etiology. The development of HAIs can prolong hospital stays, increase treatment costs, necessitate additional medications and diagnostic procedures, and lead to severe clinical outcomes. Ensuring infection safety requires special attention, particularly in high-risk departments such as intensive care, surgery, neonatology, and hematology. According to the World Health Organization, infections associated with healthcare delivery are among the critical factors significantly affecting patient safety. Therefore, infection prevention must

be an integral component of the treatment process. Main Causes of Healthcare-Associated Infections Several interrelated factors contribute to the development of HAIs. Non-compliance with sanitary and hygienic requirements, patient overcrowding, inadequate hand disinfection by healthcare workers, improper processing of medical instruments, and invasive procedures play significant roles among these factors. The source of infection may be the patient themselves, an infected healthcare worker, or the external environment. Microorganisms can spread via direct contact, indirect contact, droplets/aerosols, blood, and other biological fluids. In hospital settings, microorganisms such as Staphylococcus aureus, Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa, and Acinetobacter baumannii are clinically significant pathogens. In some cases, their resistance to antimicrobial agents complicates the treatment process even further.

Hand Hygiene — The Core Direction of Infection Prevention Adhering to hand hygiene is one of the most critical measures in limiting the spread of infections in medical facilities. A healthcare worker's hands can act as a vector for transferring microorganisms between patients, medical equipment, and the environment.

Glove utilization is also an essential part of infection safety, gloves cannot substitute for proper hand hygiene. Gloves must be replaced for each patient or procedure as required, accompanied by appropriate hand hygiene practices.

Importance of Disinfection and Sterilization Proper reprocessing of medical instruments is crucial in preventing HAIs. Depending on the application area of the instrument and the associated infection risk, appropriate cleaning, disinfection, or sterilization methods are selected. Medical devices requiring sterilization must undergo appropriate technological processes.Steam sterilization (autoclaving), dry heat in certain cases, and other validated methods are utilized for this purpose. Regular cleaning of patient wards, treatment rooms, operating theaters, intensive care units, and high-touch surfaces also serves to reduce infection risks. Invasive Procedures and Healthcare-Associated Infections

Modern medicine relies heavily on catheters, mechanical ventilators, intravenous systems, and other invasive devices. However, these devices can create additional entry portals for microorganisms into the body. For instance, prolonged use of urinary catheters increases the risk of urinary tract infections, whereas central venous catheters pose risks associated with bloodstream infections. Therefore, utilizing invasive devices strictly when clinically necessary, inserting them under aseptic conditions, and removing them as soon as possible represent vital preventive measures.The Challenge of Antimicrobial Resistance

Another critical aspect of HAIs is antimicrobial resistance (AMR). Uncontrolled, improper, or excessive use of antibiotics can accelerate the development of resistance in microorganisms, making certain bacterial infections increasingly difficult to treat. In hospital settings, strains such as MRSA, resistant Pseudomonas aeruginosa, and Acinetobacter baumannii are clinically prominent. Consequently, it is essential to administer antibiotics strictly based on clinical indications, utilize microbiological testing and antibiotic susceptibility results whenever possible, monitor treatment efficacy, and advance rational antibiotic stewardship programs.

Modern Prevention Strategies Today, the prevention of healthcare-associated infections extends beyond mere disinfection.Effective infection control demands the integrated execution of multiple strategies: 1.Education, regular training of healthcare staff on infection control and sanitary-hygienic rules.

2.Isolation and Placement: Proper placement and, when necessary, isolation of patients based on their infection transmission risk.3.Waste Management: Strict adherence to requirements for collecting, transporting, and neutralizing medical waste.4.Epidemiological Surveillance: Systematic monitoring of hospital infections, timely detection of new cases, and thorough analysis of infection outbreaks.

Environmental Hygiene: Ensuring adequate water, sanitation, and hygiene (WASH) conditions within healthcare facilities.

DISCUSSION

Relying on a single measure is insufficient to prevent healthcare-associated infections. Effective results can only be achieved when hand hygiene, disinfection and sterilization, asepsis and antisepsis, personal protective equipment, safe invasive procedures, epidemiological monitoring, and rational antibiotic use are organized as a unified, cohesive system. The growing prevalence of antimicrobial resistance highlights the urgency of infection prevention; preventing the infection itself reduces the demand for antibiotics and limits the spread of resistant microorganisms.

CONCLUSION.

Healthcare-associated infections remain a major challenge affecting patient safety in medical facilities.Non-compliance with sanitary-hygienic standards, insufficient hand hygiene, improper reprocessing of medical equipment, invasive procedures, and inappropriate antibiotic use represent key risk factors for their development.The cornerstone of HAI prevention relies on hand hygiene, asepsis and antisepsis, high-quality disinfection and sterilization, environmental cleanliness, correct use of personal protective equipment, epidemiological monitoring and rational antibiotics tewardship.

Thus,combating healthcare-associated infections must be conducted through a systematic hygienic and epidemiological approach aimed at preventing infection development, rather than merely treating infections after they occur.

REFERENCES

1. World Health Organization. Global report on infection prevention and control 2024. Geneva: WHO; 2024.
2. World Health Organization. Global report on infection prevention and control. Geneva: WHO; 2022.
3. World Health Organization. Guidelines on core components of infection prevention and control programmes at the national and acute health care facility level. Geneva: WHO; 2016.
4. World Health Organization. WHO Guidelines on Hand Hygiene in Health Care. Geneva: WHO.
5. World Health Organization. Infection prevention and control and antimicrobial resistance. Geneva: WHO.
6. World Health Organization. Global action plan on antimicrobial resistance. Geneva:WHO;2015.
7. Centers for Disease Control and Prevention. Guideline for Disinfection and Sterilization in Healthcare Facilities. CDC.

8. Allegranzi B, Pittet D. Role of hand hygiene in healthcare-associated infection prevention. Journal of Hospital Infection.

KAMYOB YER ELEMENTLARINING 2-(METILAMINO)BENZOY KISLOTASI BILAN KOMPLEKS BIRIKMALARI

Xo‘janiyazov Azamat Ruzimbayevich

Urganch davlat tibbiyot instituti

E-mail: x.azamat1992@gmail.com

Abstract. *Complex compounds of samarium (III), europium (III), terbium (III), gadolinium (III), and dysprosium (III) ions with 2-(methylamino)benzoic acid (L) were synthesized. Based on elemental and thermogravimetric analysis results, the complexes are hydrates with the composition $LnL_3 \cdot nH_2O$, where n = 1–5. Their thermal stability lies in the range of 100–240 °C. IR spectroscopy results indicate that the ligand coordinates to the metal ion in a bidentate manner via the carboxyl group. The highest luminescence intensity was observed in the Eu^{3+}, Tb^{3+}, and Dy^{3+} complexes.*

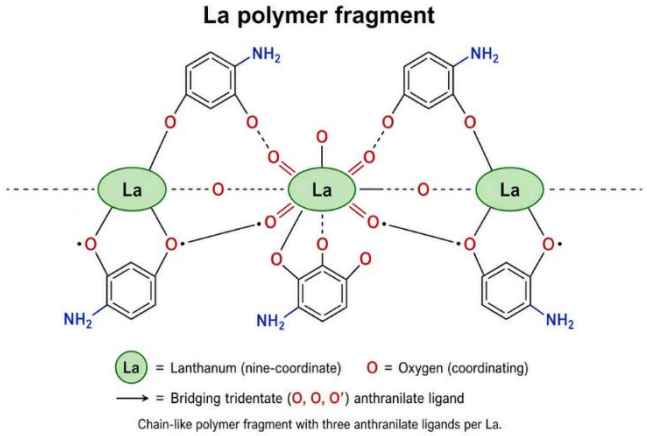
Annotatsiya. *Samariy(III), yevropiy(III), terbiy(III), gadoliniy(III) va disproziy(III) ionlarining 2-(metilamino)benzoy kislotasi (L) bilan kompleks birikmalari sintez qilindi. Element analiz va termogravimetrik tahlil natijalariga ko‘ra, kompleks birikmalar $LnL_3 \cdot nH_2O$ tarkibli gidratlar bo‘lib, n = 1-5. Ularning termik barqarorligi 100-240 °C oralig‘ida. IQ-spektroskopiya natijalariga ko‘ra, ligand metall ioniga karboksil guruhi orqali bidentat usulda koordinatsiyalanadi. Lyuminessensiyaning eng yuqori intensivligi Eu^{3+}, Tb^{3+} va Dy^{3+} komplekslarida kuzatildi.*

Keywords: *lanthanides, 2-(methylamino)benzoic acid, coordination compounds, IR spectroscopy, luminescence.*

Kalit so‘zlar: *lantanidlar, 2-(metilamino)benzoy kislotasi, koordinatsion birikmalar, IQ-spektroskopiya, lyuminessensiya.*

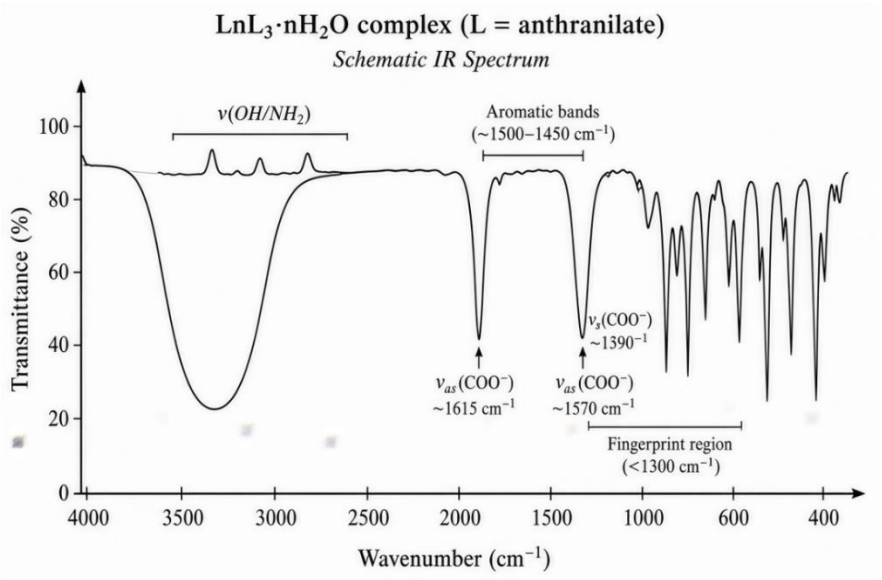
Lantanidlarning organik ligandlar bilan hosil qilgan lyuminessent komplekslari optoelektronika, xemosensorlar va organik yorug‘lik chiqaruvchi diodlarda qo‘llanilishi bilan qiziqish uyg‘otmoqda. Aromatik karboksil kislotalar asosidagi komplekslar yuqori foto- va termik barqarorligi hamda yaxshi yorug‘lik yutish xususiyati bilan ajralib turadi. Shu sababli yangi lyuminessent lantanid komplekslarini sintez qilish dolzarb hisoblanadi.

Tadqiqot usullari. Ln:HL = 1:3 nisbatda suv-spirt eritmalaridan komplekslar sintez qilindi.



1-rasm. Sintez qilingan kompleks birikmaning molekula tuzilishi

Elektron va IQ-spektrlar, lyuminessensiya hamda termogravimetrik tahlil yordamida kompleks birikmalarning xususiyatlari o‘rganildi.



2-rasm. Sintez qilingan $[Eu(C_8H_6NO_2)_3]\cdot 3H_2O$ tarkibli kompleks birikma molekulasining IQ-spektri

IQ-spektrlarida $\Delta\nu(COO^-)$ = 119 sm^{-1} qiymatining olinishi karboksil guruhining bidentat koordinatsiyalanganligini ko‘rsatdi. HL ligandining elektron spektrida 253 nm (ε = 11600) va 283 nm (ε = 1140) maksimumlar aniqlandi. Barcha komplekslarda lantanid ionlariga xos lyuminessensiya kuzatildi. Eng yuqori intensivlik Eu^{3+}, Tb^{3+} va Dy^{3+} kompleks birikmalarida qayd etildi.

Sintez qilingan kompleks birikmalarning asosiy tarkibi quyidagicha:

Kompleks birikmalar	**Tparch., °C**
$Eu(L)_3 \cdot H_2O$	185
$Sm(L)_3 \cdot H_2O$	187
$Tb(L)_3 \cdot H_2O$	195
$Gd(L)_3 \cdot H_2O$	185
$Dy(L)_3 \cdot H_2O$	192

XULOSA

2-(Metilamino)benzoy kislotasi asosida lantanidlarning gidrat komplekslari olindi. Komplekslarda ligand karboksil guruhi orqali bidentat koordinatsiyalanadi. Ularning yuqori termik barqarorligi va lyuminessent xususiyatlari amaliy qo‘llash mumkinligini ko‘rsatdi.

FOYDALANILGAN ADABIYOTLAR

1. Bünzli, J.-C. G. Lanthanide luminescence for biomedical analyses and imaging. *Chemical Reviews*.-2010.-Vol. 110.- P. 2729-2755.
2. Eliseeva, S. V., Bünzli, J.-C. G. Lanthanide luminescence sensitization by organic ligands. *Chemical Society Reviews*. -2010.-Vol. 39.-P. 189-227.
3. Kido, J., Okamoto, Y. Organolanthanide complexes for electroluminescent materials. *Chemical Reviews*. - 2002.-Vol. 102.-P. 2357-2368.

GESTATSION QANDLI DIABETNING ZAMONAVIY JIHATLARI VA XAVF OMILLARI

Negmatullayeva Mastura Nurullayevna,
t.f.d., professor
Djumayeva Farangiz Rashidovna,
magistr
Buxoro davlat tibbiyot institute

Annotatsiya: *Ushbu tadqiqotida gestatsion qandli diabet (GQD) muammosining zamonaviy jihatlari, uning tarqalishi va asosiy xavf omillari ko'rib chiqilgan. GQD ona va perinatal asoratlarning ortishiga olib keluvchi muhim tibbiy-ijtimoy muammo bo'lib qolmoqda. Maqolada homiladorlikda insulin qarshiligi shakllanishining patofiziologik mexanizmlari, metabolik "meta-yallig'lanish", oksidativ stress va lipid spektri buzilishlari ko'rib chiqilgan. GQD ning o'zgartiriladigan va o'zgartirilmaydigan xavf omillari tahlil qilingan. Kelajakda 2-tur diabet va yurak-qon tomir kasalliklari xavfini kamaytirish uchun erta tashxislash hamda pregravidar tayyorgarlikning muhimligi ta'kidlangan.*

Kalit so'zlar: *gestatsion qandli diabet, giperglikemiya, insulinorezistentlik, xavf omillari, semizlik, oksidativ stress, lipid spektri, perinatal oqibatlar.*

Abstract: *This review study examines modern aspects of gestational diabetes mellitus (GDM), its prevalence, and main risk factors. GDM remains a significant medical and social problem, contributing to an increase in maternal and perinatal complications. The article describes the pathophysiological mechanisms of insulin resistance during pregnancy, metabolic "meta-inflammation", oxidative stress, and lipid spectrum disorders. Modifiable and non-modifiable risk factors for GDM are analyzed. The importance of early diagnosis and preconception care to reduce the future risk of type 2 diabetes and cardiovascular pathology is highlighted.*

Keywords: *gestational diabetes mellitus, hyperglycemia, insulin resistance, risk factors, obesity, oxidative stress, lipid spectrum, perinatal outcomes.*

KIRISH

Ayollar salomatligini yaxshilash, onalar va bolalar o'limini kamaytirish Birlashgan Millatlar Tashkiloti (BMT) tomonidan jahon hamjamiyati oldiga

qo'yilgan asosiy maqsadlardan biridir. 2000-2015 yillar oralig'ida onalar o'limi 45% ga, bolalar o'limi esa 53% ga kamaydi. BMT Bosh Assambleyasi tomonidan 2030 yilgacha bo'lgan davrda ona va bola salomatligini muhofaza qilish ustuvor vazifa sifatida qayta deklaratsiya qilindi (United Nations, 2015a, 2015b). Xalqaro akusherlik va ginekologiya federatsiyasi (FIGO) homilador va bo'lajak bola salomatligiga xavf soluvchi yuqumli bo'lmagan kasalliklar muhimligini alohida ta'kidladi (Poon et al., 2018). Hozirgi vaqtda tug'ish yoshidagi ayollarda endokrin va ko'pincha birga kechuvchi kasalliklar ortib borayotgani xavotir uyg'otmoqda. Giperglikemiya — homiladorlik paytidagi eng keng tarqalgan endokrin buzilishlardan biridir. Birinchi marta homiladorlik paytida aniqlangan, lekin "yaqqol" qandli diabet (QD) mezonlariga javob bermaydigan giperglikemiya gestatsion qandli diabet (GQD) sifatida tasniflanadi (Dedov et al., 2012; Hod et al., 2015). Dunyo bo'ylab kattalar orasida QD bilan kasallanganlar soni 2021-yilda 536,6 millionga yetdi. 21,1 million ayolda homiladorlik giperglikemiya sharoitida o'tadi, buning deyarli 80% holatiga GQD sabab bo'ladi (International Diabetes Federation, 2021). Bu metabolik o'zgarishlar va ular bilan bog'liq buzilishlar homiladorlik va tug'ruq jarayoniga salbiy ta'sir ko'rsatib, homila tushishi, preklampsiya, yo'ldosh etishmovchiligi, makrosomiya, diabetik fetopatiya hamda kesarcha kesish chastotasining oshishiga olib keladi (Dedov et al., 2012; Hod et al., 2015).

ASOSIY QISM

Dunyoda GQD tarqalishi turli hududlarda 1% dan 30% gacha o`zgaradi. Yevropada GQD umumiy tarqalishi 5,4% ni tashkil qiladi (Egan et al., 2017). Metaanaliz natijalari anamnezida GQD bo'lgan ayollarda 2-tur QD rivojlanish xavfi 10 barobarga oshishini tasdiqladi (Vounzoulaki et al., 2020). Shuningdek, GQD kechirgan ayollarda keyinchalik yurak-qon tomir kasalliklari (YQTK) rivojlanish xavfi ikki baravargacha ortadi (Goueslard et al., 2016; Tobias et al., 2017).Homiladorlik oldi tayyorgarlik jarayonida tana vazni indeksini (TVI) me'yorlashtirish va birinchi uch oylikdagi jismoniy faollik GQD chastotasini kamaytirishi isbotlangan (Bennett et al., 2023; Quotah et al., 2024). Aksariyat

hollarda GQD o'ziga xos klinik belgilarga ega bo'lmaydi. GQD ning asosiy xavf omillariga quyidagilar kiradi: 30 yoshdan kattalikOrtiqcha tana vazni / semizlikYaqin qarindoshlarda 2-tur QD mavjudligiAnamnezda GQD bo'lganligiAnamnezda glyukozaga nisbatan bag'rikenglikning buzilishiAnamnezda yirik homila yoki o'lik tug'ilish holatlariHomiladorlik davrida homilaning glyukozaga bo'lgan yuqori ehtiyoji tufayli onaning organizmida fiziologik insulinorezistentlik (IR) shakllanadi (Zhang et al., 2016; Papysheva et al., 2019). Biroq, noto'g'ri turmush tarzi va semizlik mazkur fiziologik jarayonni patologik IR ga aylantiradi (Plows et al., 2018). Yog' almashinuvi buzilgan ayollar homiladorlikka mavjud IR bilan kirishadi, bu esa GQD ning ertaroq namoyon bo'lishiga olib keladi (Alwash et al., 2021).

Jadval 1:

Homiladorlikda tana vazni ortishining tavsiya etilgan me'yorlari

(AQSh Tibbiyot instituti, 2009)

Homiladorlikgacha TVI (kg/m²)	**Umumiy vazn ortishi (kg)**	**II va III trimesterda haftalik vazn ortishi (kg)**
Kamaygan (< 18.5)	12.5 – 18.0	0.44 – 0.58
Norma (18.5 – 24.9)	11.5 – 16.0	0.35 – 0.50
Yuqori (25.0 – 29.9)	7.0 – 11.5	0.23 – 0.33
Semizlik (≥ 30.0)	5.0 – 9.0	0.17 – 0.27

Tadqiqotlar birinchi uch oylikda TVI ning 23,5 kg/m² dan yuqori bo'lishi GQD rivojlanish xavfini keskin oshirishini ko'rsatadi (Min Hao & Li Lin, 2017). Oksidativ stress va lipid spektri buzilishlari ham IR ni kuchaytiruvchi hamda GQD ni oldindan belgilovchi muhim omillardir (Phoswa & Khaliq, 2021; Cibickova et al., 2021).

XULOSA

Semizlik, pregestatsion IR va oksidativ stress o'zgartiriladigan xavf omillari bo'lib, ularni sog'lom turmush tarzi va o'z vaqtida davolash orqali nazorat qilish mumkin. O'z vaqtida o'tkazilgan skrining va pregravidar tayyorgarlik nafaqat asoratlarni oldini oladi, balki keyingi avlodda diabet va metabolik sindrom rivojlanish xavfini keskin kamaytiradi.

ADABIYOTLAR RO'YXATI:

1. Alwash, S. M., McIntyre, H. D., & Mamun, A. (2021). The association of general obesity, central obesity and visceral body fat with the risk of gestational diabetes mellitus: Evidence from a systematic review and meta-analysis. Obesity Research & Clinical Practice, 15(5), 425-430.

2. Bennett, G., King, N., Redfern, K., & Breese, B. C. (2023). Supervised physical activity and the incidence of gestational diabetes mellitus: A systematic review and meta-analysis. The Journal of Maternal-Fetal & Neonatal Medicine, 36(1), 2155043.

3. Cibickova, L., Schovanek, J., & Karasek, D. (2021). Changes in serum lipid levels during pregnancy in women with gestational diabetes: A narrative review. Biomedical Papers of the Medical Faculty of the University Palacky Olomouc Czech Republic, 165(1), 8-12.

4. Dedov, I. I., Krasnopol'skiy, V. I., & Sukhikh, G. T. (2012). Russian National Consensus Statement on gestational diabetes: Diagnostics, treatment and postnatal care. Diabetes Mellitus, (4), 4–10.

5. Egan, A. M., Vellinga, A., Harreiter, J., et al. (2017). Epidemiology of gestational diabetes mellitus according to IADPSG/WHO 2013 criteria among obese pregnant women in Europe. Diabetologia, 60(10), 1913–1921.

6. Goueslard, K., Cottenet, J., Mariet, A. S., et al. (2016). Early cardiovascular events in women with a history of gestational diabetes mellitus. Cardiovascular Diabetology, 15(1), 15-17.

7. Hod, M., Kapur, A., Sacks, D. A., et al. (2015). The International Federation of Gynecology and Obstetrics (FIGO) Initiative on gestational diabetes mellitus: A pragmatic guide for diagnosis, management, and care. International Journal of Gynecology & Obstetrics, 131(Suppl 3), S173–S211.

8. Institute of Medicine and National Research Council. (2009). Weight Gain During Pregnancy: Reexamining the Guidelines. The National Academies Press.

9. International Diabetes Federation. (2021). IDF Diabetes Atlas (10th ed.). International Diabetes Federation.

10. Min Hao, & Li Lin. (2017). Fasting plasma glucose and body mass index during the first trimester of pregnancy as predictors of gestational diabetes mellitus in a Chinese population. Endocrine Journal, 64(5), 561–569.

11. Papysheva, O., Kotaish, G., Mayatskaya, T., et al. (2019). Gestational diabetes mellitus in obesity pandemic: Pathogenetic features. Vrach, 30(1), 27–32.

12. Phoswa, W. N., & Khaliq, O. P. (2021). The role of oxidative stress in hypertensive disorders of pregnancy and metabolic disorder of pregnancy (Gestational Diabetes Mellitus). Oxidative Medicine and Cellular Longevity, 2021, 5581570.

13. Plows, J., Stanley, J., Baker, P., Reynolds, C., & Vickers, M. (2018). The pathophysiology of gestational diabetes mellitus. International Journal of Molecular Sciences, 19(11), 3342.

14. Poon, L. C., McIntyre, H. D., Hyett, J. A., et al. (2018). The first-trimester of pregnancy - A window of opportunity for prediction and prevention of pregnancy complications and future life. Diabetes Research and Clinical Practice, 145, 20-30.

15. Quotah, O. F., Andreeva, D., Nowak, K. G., et al. (2024). Interventions in preconception and pregnant women at risk of gestational diabetes: A systematic review and meta-analysis of randomised controlled trials. Diabetology & Metabolic Syndrome, 16(1), 8.

16. Tobias, D. K., Stuart, J. J., Li, S., et al. (2017). Association of history of gestational diabetes with long-term cardiovascular disease risk in a large prospective cohort of US women. JAMA Internal Medicine, 177(12), 1735–1742.

17. United Nations. (2015a). Millennium Development Goals: Report for 2015. New York.

18. United Nations. (2015b). Transforming our world: The 2030 Agenda for Sustainable Development (Resolution A/RES/70/1).

19. Vounzoulaki, E., Khunti, K., Abner, S. C., et al. (2020). Progression to type 2 diabetes in women with a known history of gestational diabetes: Systematic review and meta-analysis. BMJ, 369, m1361.

20. Zhang, B., Jin, Z., Sun, L., Zheng, Y., et al. (2016). Expression and correlation of sex hormone-binding globulin and insulin signal transduction and glucose transporter proteins in gestational diabetes mellitus placental tissue. Diabetes Research and Clinical Practice, 119, 106-117.

СИНТЕЗ, СТРУКТУРА И СВОЙСТВА КОМПЛЕКСОВ НЕКОТОРЫХ РЕДКОЗЕМЕЛЬНЫХ ЭЛЕМЕНТОВ С ПРОИЗВОДНЫМИ АМИНОБЕНЗОЙНОЙ КИСЛОТЫ

А. Х. Хожаниязов

Ургенческий государственный медицинский университет

E-mail: x.azamat1992@gmail.com

Abstract. *The patterns of synthesis, structure, and physicochemical properties of coordination compounds formed by rare-earth elements(III) with aminobenzoic acids are examined. Particular attention is paid to lanthanide complexes with 2-, 3-, and 4-aminobenzoic acids, in which the carboxylate group acts as the primary donor moiety, while the amino group is capable of additionally participating in coordination and hydrogen bond formation.*

Аннотация. *Рассмотрены закономерности синтеза, строения и физико-химических свойств координационных соединений редкоземельных элементов(III) с аминобензойными кислотами. Особое внимание уделено комплексам лантаноидов с 2-, 3- и 4-аминобензойной кислотами, в которых карбоксилатная группа выступает основным донорным фрагментом, а аминогруппа способна дополнительно участвовать в координации и формировании водородных связей.*

Keywords: *rare-earth elements, lanthanides, aminobenzoic acid, aminobenzoates, coordination compounds, lanthanide contraction, IR spectroscopy, thermogravimetry, luminescence.*

Ключевые слова: *редкоземельные элементы, лантаноиды, аминобензойная кислота, аминобензоаты, координационные соединения, лантаноидное сжатие, ИК-спектроскопия, термогравиметрия, люминесценция.*

ВВЕДЕНИЕ

Координационная химия редкоземельных элементов(III) представляет значительный интерес благодаря разнообразию координационных чисел, геометрий и структурных мотивов, характерных для ионов лантаноидов.

Строение и координационные особенности аминобензойных кислот

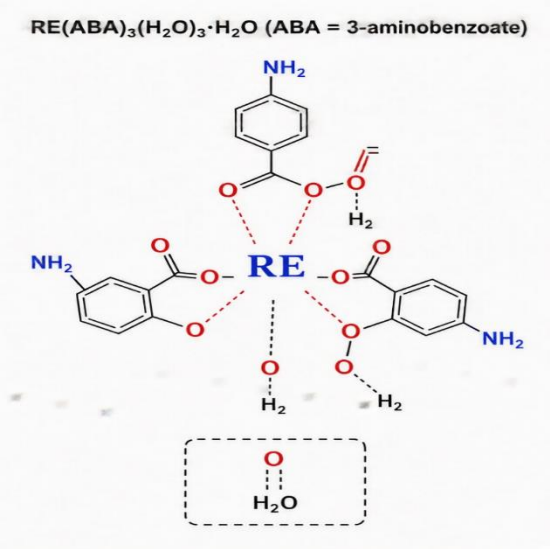


Рис. 1. Молекулярная структура синтезированного комплексного соединения

Синтез комплексов с 4-аминобензойной кислотой

В литературе описан систематический ряд комплексов редкоземельных элементов с 4-аминобензойной кислотой. В качестве исходных соединений использовали соли Ln^{3+} или растворы хлоридов, а лиганд вводили в виде свободной кислоты или её соли.

Обобщённо процесс образования аминобензоата можно представить следующим уравнением:

$$Ln^{3+} + 3L^{-} \rightarrow LnL_3$$

При недостаточной степени депротонирования аминобензойной кислоты концентрация анионной формы L^- уменьшается, что ограничивает количество карбоксилатных групп, способных непосредственно связываться с Ln^{3+}.

При увеличении pH происходит более полное превращение:

$$H_2L \rightleftharpoons HL^{-} + H^{+}$$

и образование координационно активного аминобензоат-иона.

Таким образом, pH можно рассматривать не только как параметр синтеза, но и как один из инструментов управления структурой координационного материала.

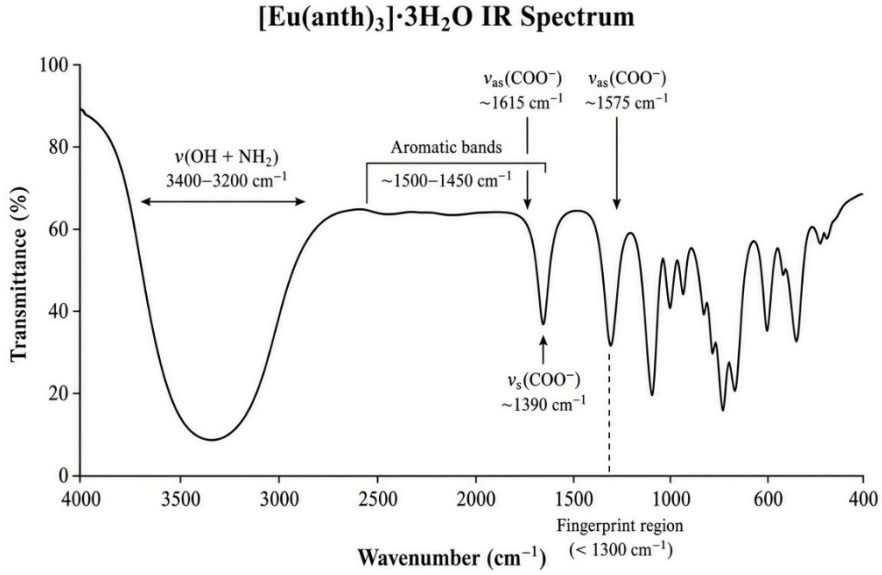


Рис. 2. ИК-спектр молекулы синтезированного комплексного соединения $[Eu(C_8H_6NO_2)_3]\cdot 3H_2O$

может использоваться для качественной оценки типа координации карбоксилатной группы. Однако для лантаноидных систем интерпретацию этого параметра целесообразно проводить совместно с данными рентгеноструктурного анализа.

Появление новых полос и изменение положения полос NH_2-группы также свидетельствуют об изменении электронной структуры лиганда при образовании координационного соединения.

ЛИТЕРАТУРА

1. Sun H.-L., Ye C.-H., Wang X.-Y., Li J.-R., Gao S., Yu K.-B. Lanthanide contraction and pH value controlled structural change in a series of rare earth complexes with p-aminobenzoic acid. Journal of Molecular Structure. 2004. Vol. 702. P. 77–83. DOI: 10.1016/j.molstruc.2004.06.013.

2. Kalembkiewicz J., Kosińska M., Zapała L. Complexes of aminobenzoic acids: A comprehensive review concerning synthesis, physical chemistry, structure and application. Coordination Chemistry Reviews. 2017. Vol. 348. P. 25–53. DOI: 10.1016/j.ccr.2017.07.004.

3. Song Y., Yan B., Chen Z. Syntheses and crystal structures of two novel lanthanide coordination compounds of 3-aminobenzoic acid. Journal of Coordination Chemistry. 2005. Vol. 58, No. 8. P. 647–652. DOI: 10.1080/00958970420000327932.

4. Thermal and spectroscopic study to investigate p-aminobenzoic acid, sodium p-aminobenzoate and its compounds with some lighter trivalent lanthanides. Thermochimica Acta. 2016. Vol. 624. P. 59–68. DOI: 10.1016/j.tca.2015.11.023.

5. Synthesis, thermoanalytical, spectroscopic study and pyrolysis of solid rare earth complexes (Eu, Gd, Tb and Dy) with p-aminobenzoic acid. Journal of Analytical and Applied Pyrolysis. 2016. Vol. 121. P. 267–274. DOI: 10.1016/j.jaap.2016.08.006.

ОСОБЕННОСТИ ОРТОПЕДИЧЕСКОЙ СТОМАТОЛОГИЧЕСКОЙ РЕАБИЛИТАЦИИ ПАЦИЕНТОВ С ЗАБОЛЕВАНИЯМИ ТОНКОГО КИШЕЧНИКА

Шосаидова Нозима Ровшан кизи

Магистр по специальности «Ортопедическая стоматология»

Central Asian University, Ташкент, Узбекистан

E-mail: shosaidovan@mail.ru

ORCID: 0009-0006-0580-5504

Научный руководитель: Зиядуллаева Н. С.

Аннотация. *Представлен обзор публикаций о стоматологических проявлениях заболеваний тонкого кишечника и их значении для ортопедической реабилитации. Рассмотрены изменения твёрдых тканей зубов и слизистой оболочки полости рта при целиакии и болезни Крона, а также возможное влияние нутритивных нарушений, сухости во рту и лекарственной терапии на планирование протезирования. Особое внимание уделено предварительной санации полости рта, оценке состояния тканей протезного ложа и индивидуальному выбору ортопедической конструкции. Заболевания тонкого кишечника сами по себе не являются абсолютным противопоказанием к протезированию, однако требуют оценки активности основного заболевания и сопутствующих факторов риска. Данные о непосредственном влиянии этих заболеваний на отдалённые результаты ортопедического лечения остаются ограниченными.*

Ключевые слова: *тонкий кишечник, целиакия, болезнь Крона, стоматологические проявления, слизистая оболочка полости рта, ксеростомия, ортопедическая реабилитация.*

Abstract. *This narrative review examines the oral manifestations of small intestinal diseases and their relevance to prosthodontic rehabilitation. It addresses changes in dental hard tissues and the oral mucosa associated with coeliac disease and Crohn's disease, together with the potential implications of nutritional deficiencies, oral dryness and medication use for treatment planning. Particular attention is given to pretreatment oral care, assessment of denture-bearing tissues and individual selection of prosthetic restorations. Small intestinal diseases do not constitute an absolute contraindication to prosthodontic treatment, but disease*

activity and associated risk factors require individual assessment. Evidence concerning their direct effects on long-term prosthodontic outcomes remains limited.

Keywords: *small intestine, coeliac disease, Crohn's disease, oral manifestations, oral mucosa, xerostomia, prosthodontic rehabilitation.*

ВВЕДЕНИЕ

Заболевания тонкого кишечника могут сопровождаться системными нарушениями, связанными с хроническим воспалением, иммунными реакциями и недостаточным всасыванием питательных веществ. Для стоматологической практики особое значение имеют целиакия и болезнь Крона с поражением тонкой кишки. При этих заболеваниях описаны дефекты эмали, рецидивирующие афтозные поражения, изменения слизистой оболочки и нарушения слюноотделения [5–9, 12–14].

Некоторые стоматологические проявления могут предшествовать установлению гастроэнтерологического диагноза. Однако они не являются самостоятельным основанием для диагностики кишечного заболевания и требуют оценки в совокупности с анамнезом и результатами обследования. В Узбекистане вопросы выявления целиакии и организации помощи таким пациентам рассматриваются в отечественных публикациях [1–4].

При планировании протезирования важно учитывать состояние слизистой оболочки, сохранившихся зубов, пародонта и слюноотделения. Болезненность, сухость во рту и воспалительные изменения могут затруднять проведение отдельных этапов лечения и адаптацию к съёмным конструкциям.

Цель обзора — обобщить сведения о стоматологических проявлениях заболеваний тонкого кишечника и определить факторы, которые следует учитывать при ортопедической стоматологической реабилитации.

ОСНОВНАЯ ЧАСТЬ

В основу описательного обзора положены 14 отечественных и зарубежных публикаций, приведённых в списке литературы. Рассмотрены работы о стоматологических проявлениях целиакии и воспалительных заболеваний кишечника. Основное внимание уделено изменениям эмали,

слизистой оболочки, пародонта и слюноотделения, а также их возможному значению для протезирования. Представленная работа не является систематическим обзором эффективности ортопедического лечения.

Целиакия — иммуноопосредованное заболевание, при котором употребление глютена у генетически предрасположенных лиц вызывает поражение слизистой оболочки тонкой кишки. Нарушение всасывания может сопровождаться дефицитом железа, фолатов и других нутриентов, а также изменениями костного обмена. Выраженность нарушений зависит от течения заболевания и эффективности его лечения [8, 12, 14].

К наиболее изученным стоматологическим проявлениям целиакии относятся системные дефекты эмали и рецидивирующий афтозный стоматит. Описаны также атрофический глоссит, ангулярный хейлит и сухость во рту. Систематические обзоры показывают неоднородность результатов исследований, обусловленную различиями в возрасте пациентов, составе выборок и диагностических критериях [5, 8, 13, 14].

Дефекты эмали, возникшие в период формирования зубов, сохраняются после стабилизации кишечного заболевания. При выборе реставрации необходимо учитывать глубину дефекта, чувствительность зуба, наличие кариеса и объём сохранившихся тканей. Само наличие целиакии не обосновывает обязательное покрытие зубов коронками: объём вмешательства определяется стоматологическими показаниями [12, 14].

Болезнь Крона может поражать различные отделы пищеварительного тракта, включая терминальный отдел подвздошной кишки. Среди характерных оральных проявлений описаны стойкий отёк губ, линейные язвы, слизистые разрастания и изменения по типу «булыжной мостовой». Неспецифические проявления включают афтозные поражения, ангулярный хейлит и воспалительные изменения слизистой оболочки [6, 7, 9].

При обнаружении подобных изменений необходимо проводить дифференциальную диагностику с травматическими, инфекционными и другими заболеваниями. Не каждое поражение полости рта у пациента с

болезнью Крона обусловлено основным заболеванием: значение могут иметь нутритивные нарушения, лекарственная терапия и местные раздражающие факторы [9].

Для ортопедического лечения особенно важно состояние тканей протезного ложа. Болезненные язвы, кандидоз и выраженное воспаление затрудняют получение точных оттисков и адаптацию к съёмному протезу. При поражениях в области контакта с будущей конструкцией сначала следует установить их причину и провести необходимое лечение. Сроки протезирования определяются состоянием тканей и общим самочувствием пациента.

Сухость во рту требует отдельной оценки. Ксеростомия обозначает субъективное ощущение сухости и не всегда сопровождается объективным снижением слюноотделения. При гипосаливации ухудшаются естественное очищение и смазывание слизистой оболочки, что может повышать риск кариеса, болезненности и травмирования тканей съёмным протезом. Поэтому при жалобах на сухость необходимо уточнять лекарственный анамнез и возможные сопутствующие причины [9].

Подготовка к протезированию включает оценку гигиены, активности кариеса, состояния пародонта, слизистой оболочки и существующих ортопедических конструкций. Систематические обзоры описывают связь воспалительных заболеваний кишечника с отдельными нарушениями стоматологического здоровья, однако эти данные не позволяют предсказать исход лечения у конкретного пациента [10, 11].

Необходимо учитывать принимаемые препараты, особенно при планировании имплантации или другого хирургического этапа. Кортикостероиды, иммуномодуляторы и биологические препараты требуют оценки в контексте дозы, длительности терапии и общего состояния пациента. Изменять назначенное гастроэнтерологом лечение самостоятельно недопустимо; при необходимости тактику согласовывают с лечащим врачом.

Выбор ортопедической конструкции должен основываться на обычных стоматологических показаниях с учётом выявленных индивидуальных рисков. При съёмном протезировании важны точность прилегания базиса, отсутствие чрезмерного давления и доступность конструкции для очищения. При несъёмном лечении необходимо сохранять ткани зуба, обеспечивать качественное краевое прилегание и возможность гигиены.

После протезирования следует контролировать состояние слизистой оболочки, комфорт при жевании и качество ухода. При появлении язв или болезненности необходимо различать механическую травму, инфекцию и проявления основного заболевания. Междисциплинарное наблюдение особенно важно при сохраняющихся поражениях слизистой оболочки или выраженных нутритивных нарушениях.

ЗАКЛЮЧЕНИЕ

Целиакия и болезнь Крона могут сопровождаться стоматологическими проявлениями, значимыми для планирования ортопедической реабилитации. Наибольшего внимания требуют дефекты эмали, поражения слизистой оболочки, сухость во рту, состояние пародонта и сопутствующие нутритивные нарушения.

Протезирование должно проводиться после необходимой подготовки полости рта с индивидуальным выбором конструкции и последующим наблюдением. Наличие заболевания тонкого кишечника само по себе не является абсолютным противопоказанием к ортопедическому лечению. Для определения его влияния на долговечность конструкций и частоту осложнений необходимы специальные клинические исследования.

СПИСОК ЛИТЕРАТУРЫ

1. Абдужабарова З. М. Клинико-генеалогический анамнез целиакии у детей узбекской популяции // Университетская наука: взгляд в будущее. 2020. С. 346–349.

2. Камилова А. Т. Модель медико-социальной реабилитации детей-инвалидов в Узбекистане на примере больных целиакией // Медицинский журнал Узбекистана. 2006. № 3. С. 44–47.

3. Камилова А. Т., Азизова Г. К., Геллер С. И. Современное состояние диагностики целиакии в Узбекистане: проблемы и решения // Вопросы детской диетологии. 2021. Т. 19, № 4. С. 15–22.

4. Умарова Ш. З., Султанбаева Н. М. У., Норов А. З. Анализ статистики гастроэнтерологических больных в Республике Узбекистан // Молодой ученый. 2019. № 3 (241). С. 100–105.

5. Cruz I. T. S. A., Fraiz F. C., Celli A., Amenabar J. M. Dental and oral manifestations of celiac disease // Medicina Oral, Patología Oral y Cirugía Bucal. 2018. Vol. 23, No. 6. P. e639–e645.

6. Lankarani K. B., Sivandzadeh G. R., Hassanpour S. Oral manifestation in inflammatory bowel disease: a review // World Journal of Gastroenterology. 2013. Vol. 19, No. 46. P. 8571–8579. DOI: 10.3748/wjg.v19.i46.8571.

7. Lauritano D., Boccalari E., Di Stasio D. et al. Prevalence of oral lesions and correlation with intestinal symptoms of inflammatory bowel disease: a systematic review // Diagnostics. 2019. Vol. 9, No. 3. Article 77. DOI: 10.3390/diagnostics9030077.

8. Lucchese A., Di Stasio D., De Stefano S., Nardone M., Carinci F. Beyond the Gut: A Systematic Review of Oral Manifestations in Celiac Disease // Journal of Clinical Medicine. 2023. Vol. 12, No. 12. Article 3874. DOI: 10.3390/jcm12123874.

9. Muhvić-Urek M., Tomac-Stojmenović M., Mijandrušić-Sinčić B. Oral pathology in inflammatory bowel disease // World Journal of Gastroenterology. 2016. Vol. 22, No. 25. P. 5655–5667. DOI: 10.3748/wjg.v22.i25.5655.

10. Nijakowski K., Gruszczyński D., Surdacka A. Oral health status in patients with inflammatory bowel diseases: a systematic review // International Journal of Environmental Research and Public Health. 2021. Vol. 18, No. 21. Article 11521. DOI: 10.3390/ijerph182111521.

11. Papageorgiou S. N., Hagner M., Nogueira A. V. B. et al. Inflammatory bowel disease and oral health: systematic review and a meta-analysis // Journal of Clinical Periodontology. 2017. Vol. 44, No. 4. P. 382–393. DOI: 10.1111/jcpe.12698.

12. Rashid M., Zarkadas M., Anca A., Limeback H. Oral manifestations of celiac disease: a clinical guide for dentists // Journal of the Canadian Dental Association. 2011. Vol. 77. Article b39.

13. Turska-Szybka A., Dąbrowska E., Głogowska K. et al. Coeliac disease and its implications on the oral health of children: a systematic review // Journal of Paediatrics and Child Health. 2023. Vol. 59, No. 10. P. 1105–1111.

14. Wieser H., Amato M., Caggiano M., Ciacci C. Dental manifestations and celiac disease—an overview // Journal of Clinical Medicine. 2023. Vol. 12, No. 8. Article 2801.

РОЛЬ ЛАБОРАТОРНЫХ ПОКАЗАТЕЛЕЙ В РАННЕЙ ДИАГНОСТИКЕ ХРОНИЧЕСКОЙ БОЛЕЗНИ ПОЧЕК

Маркабаева Гулжан Даулетбаевна

Республиканский специализированный научно-практический медицинский центр дерматовенерологии и косметологии областного филиала Республики Каракалпакстан

Аннотация. *Хроническая болезнь почек (ХБП) представляет собой одно из наиболее значимых хронических заболеваний, характеризующееся постепенным снижением функции почек и/или наличием маркеров структурного или функционального повреждения почечной ткани продолжительностью не менее трех месяцев. На ранних стадиях заболевание нередко протекает бессимптомно, вследствие чего лабораторная диагностика приобретает принципиальное значение для своевременного выявления патологических изменений. Современный диагностический подход основан прежде всего на комплексной оценке скорости клубочковой фильтрации и альбуминурии. При этом определение концентрации сывороточного креатинина с расчетом расчетной скорости клубочковой фильтрации (eGFR), исследование соотношения альбумин/креатинин мочи (UACR), а в определенных клинических ситуациях — определение цистатина С позволяют повысить диагностическую точность. Дополнительную информацию предоставляют общий анализ мочи, показатели протеинурии, электролиты, мочевина, показатели кислотно-основного состояния и другие лабораторные исследования. В статье рассматривается диагностическая роль основных лабораторных маркеров хронической болезни почек, анализируются их преимущества и ограничения, а также обосновывается необходимость комплексного подхода к раннему выявлению заболевания. Особое внимание уделяется современным рекомендациям KDIGO, согласно которым оценка пациентов с риском хронической болезни почек должна включать как исследование альбумина мочи, так и оценку скорости клубочковой фильтрации. Показано, что сочетание eGFR и UACR позволяет не только выявлять хроническое поражение почек на ранних этапах, но и оценивать риск прогрессирования заболевания.*

Ключевые слова: хроническая болезнь почек, лабораторная диагностика, креатинин, расчетная скорость клубочковой фильтрации, eGFR, цистатин С, альбуминурия, UACR, протеинурия, общий анализ мочи, ранняя диагностика.

ВВЕДЕНИЕ

Хроническая болезнь почек является серьезной медико-социальной проблемой современной системы здравоохранения. Заболевание характеризуется наличием нарушений структуры или функции почек, сохраняющихся в течение не менее трех месяцев и имеющих значение для здоровья пациента. Особенность ХБП заключается в том, что на ранних стадиях она может развиваться практически бессимптомно, в то время как патологические изменения в почечной ткани уже начинают прогрессировать.

Именно бессимптомное течение начальных стадий определяет особую роль лабораторной диагностики. Клинические проявления, такие как отеки, выраженные изменения артериального давления, нарушения водно-электролитного баланса или симптомы уремии, чаще появляются при более выраженном снижении функции почек. Поэтому выявление лабораторных маркеров поражения почек до появления выраженной клинической симптоматики является важнейшим направлением современной нефрологии.

Согласно современным рекомендациям KDIGO, для выявления хронической болезни почек необходимо использовать одновременно два основных направления лабораторной оценки: определение альбумина в моче и оценку скорости клубочковой фильтрации. При случайном выявлении повышенного соотношения альбумин/креатинин мочи, гематурии или сниженной расчетной скорости клубочковой фильтрации результаты должны быть повторно подтверждены.

Таким образом, современная концепция ранней диагностики ХБП предполагает переход от оценки одного лабораторного показателя к комплексному анализу функциональных и структурных маркеров почечного повреждения.

ОСНОВНАЯ ЧАСТЬ

Сывороточный креатинин и расчетная скорость клубочковой фильтрации

Одним из наиболее широко используемых лабораторных показателей оценки функции почек является концентрация креатинина в сыворотке крови. Креатинин образуется преимущественно в результате метаболизма мышечного креатина и выводится из организма главным образом посредством клубочковой фильтрации. При снижении фильтрационной способности почек его концентрация в крови обычно увеличивается.

Однако использование только сывороточного креатинина имеет определенные ограничения. Его концентрация зависит не только от функции почек, но и от мышечной массы, питания, возраста и ряда других факторов. Поэтому современный подход предусматривает не изолированную интерпретацию креатинина, а расчет расчетной скорости клубочковой фильтрации — **eGFR**.

eGFR представляет собой расчетную характеристику фильтрационной функции почек, получаемую на основании лабораторных показателей и демографических характеристик пациента. Национальный институт диабета, заболеваний органов пищеварения и почек США (NIDDK) подчеркивает, что eGFR является более информативным показателем функции почек, чем концентрация креатинина сама по себе, хотя расчетные уравнения также имеют определенные ограничения.

Современные рекомендации KDIGO предусматривают использование креатинин-based eGFR в качестве исходного метода оценки функции почек у взрослых, находящихся в группе риска. При наличии возможности рекомендуется дополнительно использовать цистатин С и рассчитывать комбинированный показатель eGFR на основе креатинина и цистатина С.

Следовательно, автоматическое предоставление лабораторией значения eGFR одновременно с результатом определения сывороточного креатинина является важным элементом современной лабораторной диагностики.

Альбуминурия как ранний маркер повреждения почек

Одним из наиболее значимых лабораторных признаков раннего поражения почек является наличие повышенной экскреции альбумина с мочой. В норме клубочковый фильтрационный барьер препятствует значительной потере альбумина с мочой. Повреждение клубочков может приводить к увеличению проницаемости фильтрационного барьера и появлению альбумина в моче.

Именно поэтому определение альбуминурии имеет большое значение даже в ситуациях, когда скорость клубочковой фильтрации остается относительно сохранной. NIDDK указывает, что двумя ключевыми маркерами хронической болезни почек являются альбумин мочи и eGFR.

Для количественной оценки альбуминурии широко применяется **соотношение альбумин/креатинин мочи (UACR)**. Преимущество этого метода заключается в возможности использовать разовую порцию мочи без необходимости обязательного сбора мочи в течение 24 часов. Соотношение учитывает концентрацию креатинина в образце и позволяет уменьшить влияние вариабельности концентрации мочи.

По современным рекомендациям KDIGO для первичной оценки альбуминурии предпочтительно использовать UACR в первой утренней средней порции мочи. При выявлении повышенного значения рекомендуется количественно подтвердить результат, а при UACR ≥30 мг/г — провести повторное исследование в первой утренней порции мочи.

Таким образом, UACR представляет собой один из наиболее важных инструментов раннего выявления почечного повреждения, особенно у пациентов с сахарным диабетом, артериальной гипертензией и другими факторами риска.

Значение цистатина С

В последние годы повышается интерес к цистатину С как альтернативному или дополнительному маркеру оценки функции почек. Цистатин С представляет собой низкомолекулярный белок, который

продуцируется большинством клеток организма и подвергается клубочковой фильтрации.

Одним из преимуществ цистатина С является то, что на его концентрацию в меньшей степени влияет мышечная масса по сравнению с креатинином. Поэтому его определение может быть особенно полезным в ситуациях, когда креатинин-based eGFR потенциально недостаточно точно отражает истинную фильтрационную функцию.

KDIGO 2024 рекомендует при наличии цистатина С использовать комбинацию креатинина и цистатина С для расчета eGFR, особенно в тех клинических ситуациях, когда точность одного только креатинина может быть недостаточной и результат влияет на клинические решения.

Комбинированный показатель eGFRcr-cys может повышать точность оценки стадии заболевания и более надежно характеризовать риск неблагоприятных почечных исходов по сравнению с использованием только одного маркера. Следовательно, внедрение определения цистатина С в лабораторную практику является перспективным направлением совершенствования ранней диагностики ХБП.

Общий анализ мочи

Несмотря на развитие высокотехнологичных лабораторных методов, общий анализ мочи сохраняет важное значение в диагностике заболеваний почек. Исследование позволяет оценивать физико-химические характеристики мочи, наличие белка, эритроцитов, лейкоцитов, цилиндров и других патологических элементов.

Гематурия, протеинурия и изменения осадка мочи могут указывать на наличие структурного поражения почек даже в тех случаях, когда выраженного снижения eGFR еще не наблюдается. Именно поэтому KDIGO рассматривает гематурию и альбуминурию как важные признаки, требующие дополнительной оценки и подтверждения при случайном выявлении.

При этом общий анализ мочи не должен заменять количественную оценку альбуминурии. При положительном результате тест-полоски на белок или альбумин целесообразно использовать количественные лабораторные методы, в частности UACR или соотношение белок/креатинин мочи. Такой подход позволяет повысить точность диагностики и мониторинга.

Протеинурия и соотношение белок/креатинин

Помимо альбуминурии, существенное значение имеет общая потеря белка с мочой. Для ее оценки может использоваться соотношение белок/креатинин мочи — PCR. Этот показатель позволяет оценивать протеинурию в разовой порции мочи и является удобным инструментом для лабораторного мониторинга.

KDIGO рекомендует при оценке протеинурии использовать количественные методы, а при положительном результате тест-полоски подтверждать наличие белка с помощью лабораторного количественного исследования.

Различие между альбуминурией и общей протеинурией имеет диагностическое значение, поскольку изменение состава белка в моче может отражать различные механизмы поражения почек. Поэтому выбор между UACR и PCR должен определяться клинической задачей.

Дополнительные лабораторные показатели

При подтвержденной или предполагаемой хронической болезни почек лабораторное обследование может быть расширено. В зависимости от клинической ситуации оцениваются мочевина, электролиты, глюкоза, кальций, фосфор, альбумин, показатели общего анализа крови и другие параметры. NIDDK в рамках первоначальной лабораторной оценки ХБП также рекомендует учитывать общий анализ мочи, UACR, креатинин с расчетом eGFR, мочевину, электролиты, глюкозу, кальций, фосфор, альбумин и общий анализ крови.

Эти показатели имеют значение не только для определения функции почек, но и для оценки осложнений хронического почечного заболевания. Например, снижение гемоглобина может быть связано с развитием анемии при хронической болезни почек, а нарушения кальций-фосфорного обмена могут отражать развитие минерально-костных нарушений.

Таким образом, лабораторная диагностика ХБП должна включать не только показатели фильтрационной функции, но и параметры, характеризующие системные последствия хронического нарушения функции почек.

Необходимость подтверждения хронического характера изменений

Одной из принципиальных особенностей диагностики ХБП является необходимость доказательства хронического характера выявленных изменений. Однократное снижение eGFR или однократное повышение UACR не всегда означает наличие хронической болезни почек.

KDIGO 2024 подчеркивает, что хронический характер заболевания должен быть подтвержден продолжительностью изменений не менее трех месяцев. Для этого могут использоваться предыдущие результаты оценки GFR, данные об альбуминурии или протеинурии, результаты микроскопического исследования мочи, данные визуализации, патоморфологические результаты и повторные лабораторные измерения.

Следовательно, повторное лабораторное исследование является важнейшей частью диагностического алгоритма. Особенно это важно при случайном обнаружении повышенной альбуминурии, гематурии или сниженного eGFR.

Комплексная лабораторная оценка

Современный подход к ранней диагностике ХБП можно представить как последовательную систему. На первом этапе выявляются пациенты, имеющие повышенный риск заболевания. К таким группам относятся пациенты с сахарным диабетом, артериальной гипертензией, сердечно-

сосудистыми заболеваниями и семейным анамнезом почечной недостаточности.

На втором этапе проводится лабораторный скрининг с использованием двух основных направлений — оценки eGFR и UACR. Если один или оба показателя изменены, необходимо подтвердить результат повторным исследованием.

На третьем этапе проводится уточнение причины заболевания. В зависимости от клинической ситуации могут потребоваться дополнительные лабораторные, инструментальные, генетические и морфологические исследования. KDIGO подчеркивает, что установление причины ХБП должно основываться на совокупности клинических данных, анамнеза, лабораторных исследований, визуализации, а при необходимости — генетических и патоморфологических методов.

Таким образом, сочетание eGFR и UACR позволяет оценивать не только наличие почечного повреждения, но и риск его дальнейшего прогрессирования. Повышение альбуминурии и снижение eGFR являются важными факторами, связанными с неблагоприятным прогнозом.

Современные технологии и стандартизация лабораторной диагностики

Развитие лабораторной медицины создает возможности для более раннего и точного выявления ХБП. Автоматизированные системы позволяют одновременно выполнять большое количество исследований, рассчитывать eGFR и стандартизировать представление результатов.

Особое значение приобретает стандартизация определения креатинина и цистатина С, поскольку точность расчетной GFR непосредственно зависит от качества лабораторного измерения. KDIGO рекомендует лабораториям соблюдать стандарты качества при измерении креатинина и цистатина С.

Перспективным направлением является также использование point-of-care testing (POCT), особенно в условиях ограниченного доступа к

централизованной лаборатории. KDIGO допускает применение POCT для определения креатинина и альбумина мочи в тех ситуациях, когда такой подход улучшает доступность диагностики. Однако при этом должны соблюдаться соответствующие требования к преаналитическому, аналитическому и постаналитическому качеству исследований.

ОБСУЖДЕНИЕ

Результаты анализа современных рекомендаций показывают, что ранняя лабораторная диагностика хронической болезни почек не должна основываться на одном показателе. Изолированное определение сывороточного креатинина может быть недостаточным, поскольку его концентрация зависит от различных индивидуальных факторов. Более информативным является использование креатинина с расчетом eGFR.

Одновременно нормальный или относительно сохранный eGFR не исключает раннего повреждения почек. Наличие альбуминурии может свидетельствовать о повреждении почечной ткани даже при отсутствии выраженного снижения фильтрационной функции. Именно поэтому комбинация **eGFR + UACR** является фундаментом современного лабораторного подхода к выявлению ХБП.

Дополнительное определение цистатина С позволяет повысить точность оценки GFR в определенных клинических ситуациях. Особенно важным является использование комбинированной формулы eGFRcr-cys, которая согласно KDIGO может быть предпочтительнее одного креатинин-based показателя в ситуациях, когда точность оценки GFR имеет клиническое значение.

Следовательно, современная лабораторная диагностика ХБП постепенно переходит от простого определения функциональной недостаточности почек к многофакторной оценке структурного повреждения, функционального состояния и риска прогрессирования заболевания.

ЗАКЛЮЧЕНИЕ

Лабораторная диагностика играет ключевую роль в раннем выявлении хронической болезни почек, особенно на доклинических стадиях, когда выраженные симптомы заболевания могут отсутствовать. Современный диагностический подход основывается прежде всего на совместной оценке **расчетной скорости клубочковой фильтрации и альбуминурии**.

Определение сывороточного креатинина с расчетом eGFR остается базовым методом оценки фильтрационной функции почек. Вместе с тем определение цистатина С и использование комбинированной формулы eGFRcr-cys позволяют повысить точность оценки функции почек в соответствующих клинических ситуациях.

UACR является важнейшим лабораторным маркером повреждения почек и может выявлять патологические изменения даже при относительно сохранной фильтрационной функции. Общий анализ мочи, количественная оценка протеинурии, исследование электролитов, мочевины, кальция, фосфора, альбумина и других показателей позволяют дополнительно оценить характер заболевания и его системные последствия.

Особое значение имеет подтверждение хронического характера выявленных изменений. Однократное отклонение eGFR или UACR не должно автоматически интерпретироваться как хроническая болезнь почек; необходимо подтвердить устойчивость изменений во времени, обычно не менее трех месяцев.

Таким образом, наиболее эффективная стратегия раннего выявления ХБП заключается в комплексной лабораторной оценке, включающей **креатинин → eGFR → UACR → при необходимости цистатин С → общий анализ мочи и дополнительные лабораторные исследования**. Интеграция этих показателей позволяет не только своевременно выявлять хроническое поражение почек, но и оценивать вероятность его прогрессирования, что имеет принципиальное значение для раннего начала профилактических и лечебных мероприятий.

ЛИТЕРАТУРА

1. Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. (2024). KDIGO 2024 clinical practice guideline for the evaluation and management of chronic kidney disease. *Kidney International, 105*(4S), S117–S314.
2. Levin, A., et al. (2024). Executive summary of the KDIGO 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. *Kidney International, 105*, 684–701.
3. National Institute of Diabetes and Digestive and Kidney Diseases. (2024). *Identify & evaluate patients with chronic kidney disease*. National Institutes of Health.
4. National Institute of Diabetes and Digestive and Kidney Diseases. (2024). *Laboratory evaluation of kidney disease*. National Institutes of Health.
5. National Institute of Diabetes and Digestive and Kidney Diseases. (2024). *Estimated glomerular filtration rate calculators*. National Institutes of Health.
6. National Institute of Diabetes and Digestive and Kidney Diseases. (2024). *Albuminuria: Albumin in the urine*. National Institutes of Health.
7. Inker, L. A., et al. (2021). New creatinine- and cystatin C–based equations to estimate GFR without race. *New England Journal of Medicine, 385*(19), 1737–1749.
8. Stevens, P. E., & Levin, A. (2013). Evaluation and management of chronic kidney disease: Synopsis of the KDIGO 2012 clinical practice guideline. *Annals of Internal Medicine, 158*(11), 825–830.

FEATURES OF MACRO- AND MICROELEMENT METABOLISM IN THE DEVELOPMENT OF MINOR HEART ANOMALIES IN CHILDREN

Achilova Feruza Akhtamovna

Assistant of the Department of propaedeutics of children's diseases Samarkand State Medical University Samarkand, Uzbekistan

e-mail feruza-italiya@mail.ru ORCID 0000-0003-4264-2143

Rabbimova Dilfuza Toshtemirovna

MD, Associate Professor, Head of the Department of Propaedeutics of Children's Diseases Samarkand State Medical University Samarkand, Uzbekistan.

e-mail: dilfuzarabbimoova@gmail.com ORCID 0000-0003-0377-2359

Abstract *Minor heart anomalies (MHAs), including mitral valve prolapse (MVP), false left ventricular chords, and patent foramen ovale, represent localized phenotypic manifestations of systemic undifferentiated connective tissue dysplasia (UCTD). The structural integrity of the cardiac extracellular matrix depends fundamentally on the metabolic homeostasis of essential macro- and microelements. This thesis examines the biochemical paradigm of "diselementosis"—a systemic imbalance of magnesium, calcium, copper, and zinc—in the pathogenesis of pediatric MHAs. Magnesium serves as a critical cofactor for fibroblast collagen synthesis and myocardial electrophysiological stability, with its deficiency directly correlating to myxomatous valve degeneration and arrhythmogenesis. Copper functions as an obligate cofactor for lysyl oxidase (LOX), the metalloenzyme responsible for the covalent cross-linking of collagen and elastin fibers; copper deficiency therefore precipitates mechanical failure of the cardiac connective tissue framework. Concurrently, zinc and calcium regulate matrix metalloproteinases and cellular signaling. The diagnostic incorporation of elemental profiling and the measurement of matrix degradation biomarkers, such as serum hydroxyproline, provide critical insight into the active state of UCTD. Consequently, therapeutic paradigms for MHAs must encompass targeted pathogenetic interventions, including magnesium salts, copper and zinc supplementation, structural amino acids, and bioenergetic cofactors, to stabilize connective tissue architecture and prevent adverse cardiovascular complications.*

Keywords: *Minor heart anomalies, connective tissue dysplasia, diselementosis, magnesium deficiency, lysyl oxidase, copper, zinc, collagen cross-linking, pediatric cardiology, mitral valve prolapse.*

INTRODUCTION TO MINOR HEART ANOMALIES AND DISELEMENTOSIS.

In pediatric cardiology, minor anomalies of the heart (MHAs) are defined as hereditary or congenital structural deviations of the cardiac valvular apparatus, subvalvular structures, and great vessels that do not initially precipitate gross hemodynamic failure. Common MHAs include mitral valve prolapse (MVP), abnormally located or multiple left ventricular false chords, asymmetric aortic valves, and atrial septal aneurysms. Rather than existing as isolated anatomical defects, MHAs are increasingly recognized as primary visceral phenotypic markers of undifferentiated connective tissue dysplasia (UCTD).

The etiological foundation of UCTD and its associated MHAs lies in the disruption of collagen and elastin fibrillogenesis. This morphogenetic failure is profoundly influenced by "diselementosis"—a systemic metabolic imbalance characterized by the deficiency or dysregulation of critical macro- and microelements. Elements such as magnesium, calcium, copper, and zinc act as non-negotiable enzymatic cofactors required for the synthesis, spatial organization, and structural stabilization of the cardiac extracellular matrix (ECM). Consequently, deviations in the elemental status of a pediatric patient directly compromise the mechanical resilience of cardiac tissues, increasing the long-term risk for arrhythmogenesis, infective endocarditis, and progressive valvular regurgitation.

The Role of Macroelements in Cardiac Matrix Morphogenesis. The metabolism of macroelements, particularly magnesium and calcium, provides the foundational biochemical environment required for continuous connective tissue maintenance and cardiac electrophysiological stability.

Magnesium: Fibroblast Regulation and Electrophysiological Stability. Magnesium is the most critical macroelement implicated in the pathogenesis of

UCTD and MHAs. It is an essential intracellular cation that participates in over 300 enzymatic reactions, including those governing protein synthesis and cellular bioenergetics. Within the cardiac ECM, magnesium is intrinsically woven into the ground substance of the connective tissue, where it is strictly required for the proper formation of collagen fibers. Pediatric cohorts with signs of UCTD consistently demonstrate a tendency toward systemic hypomagnesemia. Under conditions of magnesium deficiency, the ability of fibroblasts to produce and organize collagen is severely impaired. This biochemical failure is particularly evident in the mitral valve apparatus. A high prevalence of idiopathic magnesium deficiency has been documented in pediatric patients exhibiting MVP, leading to myxomatous degeneration—a process where the collagenous fibrosa layer becomes disorganized and mechanically incompetent.

Beyond structural synthesis, magnesium provides critical membrane-stabilizing effects. By regulating the intracellular concentration of potassium and modulating calcium-induced calcium release (CICR) via the Ryanodine receptor (RyR2), magnesium prevents sympathicotonic overstimulation. Children with MHAs, particularly those with multiple false chords that mechanically irritate the endocardium, possess an elevated risk for re-entry arrhythmias. Magnesium deficiency exacerbates this risk by lowering the action potential threshold and establishing a pathological calcium-leak cycle, fostering an environment primed for premature ventricular contractions and paroxysmal tachycardias.

Calcium: Matrix Signaling and Mineralization. While primarily associated with skeletal mineralization, calcium homeostasis is intricately linked to magnesium metabolism and ECM structural regulation. Clinical evaluations of children aged 6–17 years with UCTD frequently reveal a statistically significant decrease in serum calcium concentrations, often presenting alongside diminished bone mineral density and osteopenia. In the dysplastic heart, an imbalance in the calcium-to-magnesium ratio disrupts normal cellular signaling. A relative intracellular calcium overload, secondary to hypomagnesemia, can trigger the activation of calcium-dependent proteases that accelerate the degradation of the

fragile connective tissue matrix. Furthermore, evaluations such as the Sulkovich urine test are frequently deployed to monitor abnormal calcium excretion, serving as a non-invasive marker of systemic mineral dysregulation in children with MHAs.

Microelements: Catalysts of Covalent Matrix Stabilization. Trace microelements act as highly specific catalytic engines for the structural maturation of the heart's architecture. The synergistic deficiencies of copper and zinc form the biochemical epicenter of connective tissue fragility in UCTD.

Copper: The Linchpin of Lysyl Oxidase and Collagen Cross-Linking. Copper assumes a paramount role in cardiovascular morphogenesis through its function as an obligate cofactor for the lysyl oxidase (LOX) family of metalloenzymes. LOX enzymes catalyze the oxidative deamination of specific epsilon-amino groups of lysine and hydroxylysine residues located in the telopeptide regions of newly synthesized collagen and elastin. This reaction generates highly reactive allysine aldehydes (alpha-aminoadipic-delta-semialdehydes) that undergo spontaneous condensation to form inter- and intramolecular covalent cross-links.

This copper-dependent cross-linking is the exclusive biochemical mechanism by which cardiac connective tissue acquires its definitive tensile strength and elasticity. A deficiency in bioavailable copper fundamentally arrests this process. Consequently, collagen fibers are secreted by fibroblasts but remain structurally immature and mechanically incompetent. Under the continuous hemodynamic stress of the cardiac cycle, this un-cross-linked tissue yields, resulting in the phenotypic expression of MHAs such as MVP, atrial septal aneurysms, and aortic root dilation. Analyses of trace elements in pediatric UCTD cohorts frequently identify a persistent tendency toward decreased systemic copper concentrations, confirming its pathogenic role in structural cardiac anomalies.

Zinc: Matrix Remodeling and Enzymatic Regulation. Zinc operates as a cofactor for metalloenzymes regulating cellular proliferation, tissue regeneration,

and matrix remodeling. In the cardiac ECM, zinc is essential for baseline collagen synthesis and acts as a primary regulator of matrix metalloproteinases (MMPs)—the enzymes responsible for cleaving collagen fibers. An imbalance in zinc homeostasis leads to the aberrant hyperactivation of MMPs, accelerating the breakdown of the cardiac connective tissue faster than it can be synthesized. Epidemiological data indicate that UCTD is highly prevalent in regions characterized by endemic environmental zinc deficiency, affecting up to 30–70% of adolescents in such areas. Zinc deficiency, often presenting alongside copper and magnesium deficits, drives visually apparent phenotypic markers of UCTD, including hyper-elastic skin and severe atopic dermatitis, mirroring the internal fragility of the cardiac valves.

Trace Element	Primary Enzymatic Role in Extracellular Matrix	Pathological Consequence of Deficiency	Clinical Phenotype in the Pediatric Heart
Magnesium (Mg)	ATP-dependent fibroblast activation; RyR2 regulation.	Impaired collagen synthesis; membrane hyper-excitability.	Mitral valve prolapse; increased arrhythmogenic risk.
Copper (Cu)	Obligate cofactor for Lysyl Oxidase (LOX).	Failure of covalent cross-linking in collagen and elastin.	Valve leaflet elongation/prolapse; atrial septal aneurysms.
Zinc (Zn)	Regulation of Matrix Metalloproteinases (MMPs).	Accelerated, unchecked proteolytic degradation of the ECM.	Connective tissue friability; progressive structural weakening.
Calcium (Ca)	Cellular signaling; excitation-contraction coupling.	Activation of calcium-dependent proteases; altered bone density.	Concomitant osteopenia; disruption of myocardial mechanics.

Diagnostic Profiling and Biomarkers of Matrix Degradation. The comprehensive diagnosis of MHAs extends beyond morphological visualization to encompass the metabolic profiling of the underlying dysplastic syndrome. Two-

dimensional and Doppler echocardiography remain the gold standard for structural characterization, identifying anomalies such as abnormal left ventricular trabeculae, which are present in up to 11% of affected pediatric cohorts. Due to the arrhythmogenic potential of these structural variants, 24-hour Holter electrocardiogram monitoring is frequently indicated to detect subclinical extrasystoles. Biochemically, advanced diagnostic protocols incorporate markers of active matrix metabolism. Serum hydroxyproline is utilized as a primary quantitative index of accelerated collagen degradation. Clinical studies demonstrate a statistically significant elevation in average serum hydroxyproline levels in children with MHAs and concomitant cardiovascular pathology, corroborating the presence of an active catabolic state. Furthermore, the definitive diagnosis of "diselementosis" is achieved through atomic emission spectrometry of hair or blood serum, providing a precise quantification of systemic copper, zinc, magnesium, and calcium deficits, which correlate directly with the clinical severity of the UCTD.

Therapeutic Paradigms: Pathogenetic Metabolic Correction. Because MHAs are phenotypic expressions of a metabolic deficiency, therapeutic strategies prioritize pathogenetic metabolic correction over pure anatomical observation. The objective is to arrest matrix degradation, stimulate de novo collagen synthesis, and stabilize cardiac electrophysiology through targeted nutritional and pharmacological interventions. The pharmacological management of UCTD is stratified into distinct therapeutic groups:

1. **Trace Element Donors:** Targeted supplementation with copper () and zinc () ions is indicated to restore LOX cross-linking activity and normalize MMP-mediated matrix degradation.

2. **Magnesium and Mineral Stabilizers:** Organic magnesium preparations (e.g., magnesium orotate, magnesium B6) are administered to optimize fibroblast collagen production and exert an endogenous anti-arrhythmic effect. Prolonged use of magnesium orotate has demonstrated high clinical efficacy in reducing the anatomical depth of MVP and mitigating associated mitral regurgitation.

Concurrently, calcium and Vitamin D3 stabilizers are utilized to correct systemic osteopenia.

3. **Substrate and GAG Correctors:** The synthesis of the ECM demands raw structural substrates. Amino acid complexes rich in glycine, proline, and valine, alongside Vitamin C (an obligate electron donor for prolyl hydroxylase), are administered to facilitate the proper assembly of the collagen triple helix. Chondroitin sulfate and glycosaminoglycan (GAG) precursors are utilized to rebuild the compressive ground substance of the matrix.

4. **Bioenergetic Modulators:** Fibroblast activity is highly energy-dependent. Modulators such as L-carnitine (Elcar), Coenzyme Q10, and B-complex vitamins optimize mitochondrial ATP production, ensuring that cellular bioenergetics can sustain continuous tissue remodeling.

Therapy with these metabolic correctors should be administered both in the presence of symptomatic disease and for prophylactic purposes—particularly during periods of rapid somatic growth in adolescence—to facilitate the normal formation of the connective tissue framework and an adequate physiological response to hemodynamic stress.

CONCLUSION

Minor heart anomalies in children are not benign, static anatomical variants, but rather dynamic phenotypic markers of systemic undifferentiated connective tissue dysplasia. The structural failure of the cardiac matrix is intimately driven by "diselementosis"—a profound metabolic imbalance of essential macro- and microelements. Deficiencies in magnesium stall collagen synthesis and destabilize myocardial electrophysiology, while the lack of bioavailable copper functionally inhibits lysyl oxidase, preventing the critical covalent cross-linking required for tissue tensile strength. Concurrently, zinc dysregulation accelerates proteolytic matrix degradation. By shifting the clinical paradigm from pure anatomical observation to pathogenetic metabolic correction—utilizing targeted elemental supplementation, structural amino acids, and bioenergetic cofactors—clinicians can effectively arrest matrix degradation, enhance the resilience of the cardiac

valvular apparatus, and significantly reduce the long-term risk of adverse arrhythmogenic and hemodynamic complications in pediatric patients.

REFERENCES:

1. Achilova F.A. Current understanding of minor cardiac abnormalities in children. International Journal of Scientific Pediatrics. Volume 4 | Issue 2 | 2025
2. Achilova F.A. Risk factors for the development of small heartabnormalities in children. International Journal of Scientific Pediatrics. Volume 4 | Issue 2 | 2025
3. Corone S, Iliou MC, Manderscheid JC, Lim P, Sebaoun A, Raczka F, et al. Outcome of children with minor congenital heart disease. Cardiol Young. 2007;17(2):221–232.
4. Delling FN, Vasan RS. Epidemiology and pathophysiology of mitral valve prolapse. New insights into disease progression, genetics, and molecular basis. Circulation. 2014;129(21):2158–2170.
5. Wren C, Richmond S, Donaldson L. Presentation of congenital heart disease in infancy: implications for routine examination. Arch Dis Child Fetal Neonatal Ed. 1999;80(1):F49–F53.
6. Ачилова Ф.А., Жалилов А.Х. Данные эхокардиографии при малых аномалиях сердца у детей. E- Conference Zone. 2022.
7. Ачилова Ф.А., Жалилов А.Х. Показатели эхокардиографии при малых аномалиях сердца у детей. Журнал проблемы биологии и медицины. №1 (93). стр. 33-35. 2017 г.
8. Ачилова Ф.А., Ибатова Ш.М., Абдукадирова Н.Б. Распространенность малых аномалий сердца у детей по данным эхокардиографии. Международный журнал научной педиатрии. №5. Стр.11-15. Издатель ООО «I-EDU GROUP». 2022 г.

ФЕНОТИПИЧЕСКИЕ МАРКЕРЫ НЕДИФФЕРЕНЦИРОВАННОЙ ДИСПЛАЗИИ СОЕДИНИТЕЛЬНОЙ ТКАНИ У ДЕТЕЙ С МАЛЫМИ АНОМАЛИЯМИ СЕРДЦА

Ф.А. Ачилова, Д.Т. Раббимова

Самарканд Давлат Тиббиёт Университети

feruza-italiya@mail.ru

Аннотация: *В статье представлен анализ превалентности 12 экзофенотипических маркеров недифференцированной дисплазии соединительной ткани (НДСТ) у 150 детей с малыми аномалиями сердца (МАС). Установлено, что системное течение НДСТ ассоциировано со статистически достоверным доминированием суставной гипермобильности (76,7%), кожной гиперэластичности (40,0%), грыжевых выпячиваний (33,3%) и зубочелюстных аномалий (30,0%). В когорте пациентов с изолированными МАС частота выявления данных стигм сопоставима с популяционной нормой (P>0,05). Скрининг указанных фенотипических предикторов обладает высокой диагностической валидностью для ранней верификации генерализованного диспластического процесса в педиатрической практике.*

Ключевые слова: *недифференцированная дисплазия соединительной ткани (НДСТ); малые аномалии сердца (МАС); фенотипические маркеры; гипермобильность суставов; кожная гиперэластичность; статистический анализ в педиатрии; прогностическая ценность внешних стигм.*

Abstract *This article analyzes the prevalence of 12 exophenotypic markers of undifferentiated connective tissue dysplasia (UCTD) in 150 children with minor cardiac anomalies (MCAs). Systemic UCTD was found to be associated with a statistically significant predominance of joint hypermobility (76,7%), skin hyperextensibility (40,0%), hernia protrusion (33,3%), and dentofacial anomalies (30,0%). In the cohort of patients with isolated MCAs, the detection frequency of these stigmata was comparable to the population norm (P >0,05). Screening for these phenotypic predictors demonstrates high diagnostic validity for the early verification of a generalized dysplastic process in pediatric practice.*

Keywords: *undifferentiated connective tissue dysplasia (UCTD); minor cardiac anomalies (MCAs); phenotypic markers; joint hypermobility; skin hyperextensibility; statistical analysis in pediatrics; predictive value of external stigmata.*

ВВЕДЕНИЕ

Вектор современной педиатрии все чаще смещается в сторону комплексного изучения недифференцированной дисплазии соединительной ткани, которая приобрела статус значимой междисциплинарной проблемы [1]. Эта патология представляет собой генетически обусловленный дефект морфогенеза соединительнотканного матрикса, который проявляется широким спектром функциональных и структурных сбоев в различных системах организма [2]. Малые аномалии сердца крайне широко распространены в педиатрической популяции, из-за чего перед клиницистами стоит острая задача: дифференцировать локальные анатомические варианты строения миокарда от системного диспластического процесса [3]. Экзофенотипические стигмы выступают своего рода «диагностическим окном», дающим возможность на ранних этапах заподозрить генерализацию процесса [4]. Основная цель настоящего исследования заключалась в детализированном анализе распространенности и диагностической валидности 12 внешних признаков у пациентов с МАС для верификации системного течения НДСТ.

Материалы и методы исследования. Клинико-статистическому разбору были подвергнуты массивы данных, полученные при обследовании трех педиатрических когорт: I группа (n=60): Дети с диагностированными малыми аномалиями сердца, протекающими на фоне генерализованной недифференцированной дисплазии соединительной ткани. II группа (n=60): Пациенты с аналогичными кардиальными аномалиями, у которых при комплексном скрининге не было выявлено признаков системного патологического процесса. Контрольная группа (n=30): Практически здоровые дети, не имеющие кардиальной патологии и клинических проявлений НДСТ. Методология статистической оценки базировалась на вычислении критерия согласия Пирсона, расчете уровня достоверности различий (P) и вычислении отношения шансов (OR) для объективизации

риска взаимосвязи конкретного фенотипического маркера с системной дисплазией.

Результаты исследований. Фундаментом фенотипического профиля при системных формах НДСТ традиционно служат патологии опорно-двигательной системы [5]. Сравнительный анализ костно-суставных стигм показал следующие результаты: Гипермобильность суставов: Стала самым распространенным признаком в I группе, встречаясь у 76,7% (46 пациентов). При сопоставлении со II группой (6,7%; 4 ребенка) зафиксирована колоссальная разница (χ^2= 60,48; P <0,001; OR = 46,00). В контроле данный признак не выявлялся (0,0%), что также имеет высокую статистическую значимость (χ^2= 47,05; P <0,001). Плоскостопие (раннее выявление): Было зарегистрировано у 25,0% обследованных из I группы. У представителей II группы этот показатель составил всего 1,7% (χ^2 = 14,13; P <0,001; OR = 19,67), а в когорте здоровых детей отсутствовал вовсе (χ^2 = 9,00; P<0,01). Патология прикуса/высокое нёбо: Фиксировались в 30,0% случаев среди детей I группы. Для сравнения, во II группе их частота равнялась 3,3% (χ^2= 15,36; P<0,001; OR = 12,43), а в контрольной – 0,0% (χ^2=11,25; P<0,001). Частые вывихи/подвывихи: Характерны для 18,3% пациентов основной группы. Различия по данному параметру со II группой (1,7%) и нормой (0,0%) оказались статистически достоверны: χ^2= 9,26; P<0,01; OR = 13,24 и χ^2=6,27; P<0,05 соответственно. Сколиотическая осанка: Диагностирована у 16,7% в I группе на фоне 1,7% во II когорте (χ^2= 8,11; P<0,01; OR = 11,80) и полного ее отсутствия в контроле (χ^2=5,63; P<0,05).

Характеристика кожных и мягкотканых проявлений. Аномалии дермы и мягкотканных структур напрямую указывают на деструкцию эластических и коллагеновых волокон [6]. Итоги анализа: Кожная гиперэластичность: Фиксировалась у 40,0% детей I группы. Во II группе показатель составил 5,0% (χ^2= 21,08; P<0,001; OR =12,67), в контроле — 0,0% (χ^2= 16,36; P<0,001). Разница между II группой и контролем оказалась статистически незначимой (χ^2= 1,55; P>0,2). Грыжи (паховые, пупочные): Отмечались у 33,3%

пациентов I группы. В группе с изолированными МАС грыжи выявлялись у 8,3% (χ^2= 11,37; P<0,001; OR = 5,50), в контрольной — у 3,3% (χ^2= 10,06; P < 0,01; OR=14,50), без выраженных различий между последними двумя (χ^2= 0,80; P > 0,2). Мягкие ушные раковины: Встречались у 31,7% детей первой группы. Среди пациентов второй группы стигма отмечалась у 6,7% (χ^2= 12,10; P<0,001; OR = 6,49), в контроле отсутствовала полностью (χ^2= 12,04; P < 0,001). Отличия II группы от здоровых детей не подтвердились (χ^2= 2,09; P>0,1).

Генерализованный процесс при НДСТ неизбежно затрагивает не только скелет, но и мышечный аппарат, а также венозную стенку [2]: Гипотрофия мышц плечевого пояса: Диагностирована у 28,3% детей основной группы. В остальных когортах этот признак встречался кратно реже: 6,7% во II группе (χ^2= 9,75, P<0,01, OR = 5,53) и 3,3% у здоровых детей (χ^2= 7,81, P<0,01, OR = 11,47). Венозная дисфункция (акроцианоз стоп/кистей): Выявлялась у 23,3% пациентов I группы, тогда как во II группе — всего у 3,3% (χ^2= 10,38; P<0,01; OR = 8,83), а в контрольной группе не фиксировалась вообще (χ^2= 8,29; P<0,01).

Варикоз подкожных вен стоп: Был найден у 13,3% представителей I группы. Данный маркер признан фактически патогномоничным, поскольку его частота во II и контрольной группах составила абсолютный ноль (0,0%). Значимость этого факта подтверждена математически: I vs II (χ^2=8,57; P<0,01) и I vs Контроль (χ^2 = 4,39; P<0,05).

Результаты однозначно свидетельствуют о том, что у пациентов I группы отмечается высокая плотность внешних маркеров (от 13,3% до 76,7%), объективизирующая системность поражения. Напротив, при изолированных МАС (II группа) подобной агрегации стигм не наблюдается, а их распределение совпадает с профилем здоровой популяции. Интегративная оценка маркеров с высокими OR и χ^2— обязательное условие для своевременной постановки диагноза и разработки персонифицированного плана ведения больного. Полученная доказательная

база открывает широкие горизонты для последующего углубленного анализа проявлений НДСТ. Крайне актуальным видится проспективный мониторинг пациентов с верифицированными стигмами для оценки траектории развития патологии и предотвращения осложнений. Рекомендуется расширить панель скрининга, включив в нее оценку арахнодактилии (симптомы запястья и большого пальца), детальную анатомию ушных раковин (подвижность, оттопыренность) и углубленный ортодонтический анализ (скученность зубного ряда, диастемы).

ВЫВОДЫ

Резюмируя вышеизложенное, проведенное клиническое исследование неопровержимо подтверждает исключительную диагностическую значимость внешних маркеров при верификации системной НДСТ у пациентов педиатрического профиля с МАС. Кожная гиперэластичность, суставная гипермобильность и плоскостопие выступают наиболее надежными предикторами системной генерализации процесса. Полное отсутствие накопления перечисленных маркеров у детей с изолированными сердечными аномалиями акцентирует критическую важность дифференциального диагноза в педиатрии. Применение комплексного фенотипического скрининга, апробированного в данной работе, обеспечивает возможность своевременной диагностики системной патологии, что существенно повысит качество жизни пациентов и поможет оптимизировать лечебно-диагностические мероприятия.

СПИСОК ЛИТЕРАТУРЫ

1. **Земцовский Э. В.** Диспластические фенотипы. Диспластическое сердце (аналитический обзор). — СПб.: Изд-во «Ольга», 2007. — 80 с.

2. **Кадурина Т. И., Горбунова В. Н.** Дисплазия соединительной ткани: Руководство для врачей. — СПб.: Элби-СПб, 2009. — 704 с.

3. **Трисветова Е. Л., Бова А. А.** Малые аномалии сердца // Клиническая медицина. — 2002. — № 1. — С. 9–15.

4. **Нечаева Г. И., Яковлев В. М., Конев В. П. и др.** Дисплазия соединительной ткани: основные клинические синдромы, формулировка диагноза, лечение // Лечащий врач. — 2008. — № 2. — С. 22–28.

5. **Арсентьев В. Г., Баранов В. С., Шабалов Н. П.** Наследственные заболевания соединительной ткани как конституциональная основа полиорганной патологии у детей. — СПб.: СпецЛит, 2014. — 244 с.

6. **Чемоданов В. В., Горнаков И. С., Буланкина Е. В.** Особенности течения заболеваний у детей с дисплазией соединительной ткани. — Иваново: ГОУ ВПО ИвГМА Росздрава, 2010. — 140 с.

5-SECTION

PROSPECTS AND CHALLENGES OF DEVELOPING THE ORGANIC FOOD MARKET IN UZBEKISTAN

Samariddin Berdiyev

PhD Researcher (Doctoral Candidate)

Denov Institute of Entrepreneurship and Pedagogy, Department of Digital Economics, Uzbekistan

samdin3353@gmail.com

Abstract. *This article examines the current state, key drivers, and constraints shaping the development of the organic food market in Uzbekistan. Drawing on national statistical data and international comparative evidence, the study identifies limited certification infrastructure, low consumer awareness, and underdeveloped supply chains as the principal barriers to market growth, while noting rising export demand and government diversification policy as key opportunities. The paper concludes that a coordinated strategy combining certification system development, farmer training, and targeted export promotion is required to position Uzbekistan competitively within the regional organic food sector.*

Keywords: *organic agriculture, organic food market, Uzbekistan, sustainable development, food certification, agricultural export.*

INTRODUCTION

The global organic food market has expanded rapidly over the past two decades, driven by rising consumer awareness of health, environmental sustainability, and food safety. According to IFOAM – Organics International, the world's certified organic agricultural land exceeded 76 million hectares by the early 2020s, with retail sales of organic products surpassing 120 billion euros annually (IFOAM – Organics International, 2022). For transition economies such as Uzbekistan, the organic sector represents both a strategic opportunity for export diversification and a pathway toward more sustainable agricultural practices.

Uzbekistan possesses considerable natural potential for organic production: diverse agro-climatic zones, a long tradition of smallholder farming, and

comparatively low historical use of synthetic agrochemicals in many rural districts. However, the transition from conventional to certified organic production remains constrained by structural, institutional, and market-related barriers. The purpose of this study is to analyze the current state of Uzbekistan's organic food market, identify the principal obstacles to its development, and propose policy-relevant directions for its future growth.

The research addresses three interrelated questions: (1) what is the current scale and structure of organic production and trade in Uzbekistan; (2) what institutional and market barriers constrain sector growth; and (3) which policy measures could most effectively accelerate the formalization and expansion of the organic food market.

MATERIALS AND METHODS

This study employs a qualitative-analytical approach combining a review of national statistical data (O'zbekiston Respublikasi Statistika agentligi, 2023), international sector reports (FAO, 2023; IFOAM – Organics International, 2022; World Bank, 2021), and secondary academic literature on organic agriculture in transition economies. Comparative analysis was used to benchmark Uzbekistan's organic sector indicators against regional Central Asian peers and selected international examples. Institutional barriers were assessed through document analysis of existing agricultural policy frameworks and certification regulations currently applicable in Uzbekistan.

RESULTS AND DISCUSSION

Current state of the sector. Organic agriculture in Uzbekistan remains at an early stage of formal development. While a considerable share of smallholder production in remote districts is de facto low-input and free of synthetic chemical use, only a small fraction of this output is certified according to internationally recognized organic standards. The absence of a fully operational national certification body means that most producers wishing to access premium export markets must rely on costly third-party foreign certification, which is financially prohibitive for the majority of small and medium-sized farms.

Market drivers. Several factors are creating favorable conditions for organic sector growth. First, the government's broader agricultural diversification strategy, aimed at reducing dependence on cotton and wheat monoculture, creates policy space for promoting higher-value crops, including organically grown fruits, vegetables, and dried produce. Second, growing export demand from European and Gulf markets for organic dried fruits, nuts, and spices offers a concrete commercial pathway, given Uzbekistan's existing horticultural export base. Third, rising domestic urban consumer interest in food safety and health, although still nascent compared to Western markets, is gradually creating a small but growing domestic demand segment.

Constraints. The principal constraints identified are fourfold. Certification infrastructure remains underdeveloped, with limited domestic accreditation capacity and reliance on foreign certifying agencies. Farmer awareness and technical knowledge of organic production standards, record-keeping requirements, and conversion periods are generally low, particularly outside pilot project areas. Supply chain and logistics infrastructure connecting certified producers to export markets is fragmented, resulting in higher transaction costs and quality inconsistency. Finally, financing mechanisms tailored to the multi-year conversion period required for organic certification are largely absent from the domestic agricultural lending system.

Policy implications. Addressing these constraints requires a coordinated, multi-stakeholder strategy. Establishing a nationally accredited certification body, harmonized with EU and international organic standards, would substantially reduce certification costs for producers seeking export markets. Targeted training programs, delivered in partnership with agricultural extension services and higher education institutions, could raise farmer capacity in organic production and documentation practices. Dedicated credit lines or conversion-period subsidies, similar to instruments used in other transition economies, would help offset the income risk farmers face during the certification transition. Finally, coordinated export promotion, linking certified producers directly with international buyers

through trade fairs and digital marketing platforms, could accelerate market access.

CONCLUSION

The organic food market in Uzbekistan remains nascent but holds meaningful potential given the country's agro-climatic diversity, existing horticultural export base, and ongoing agricultural diversification policy. Realizing this potential will depend on addressing four interlinked constraints: certification infrastructure, farmer technical capacity, supply chain coordination, and access to conversion-period financing. A coordinated national strategy that combines accredited certification, targeted farmer training, and export promotion offers the most viable pathway for positioning Uzbekistan competitively within the regional and global organic food sector over the medium term. Future research should focus on empirical, farm-level cost-benefit analysis of organic conversion under Uzbekistan's specific agro-economic conditions.

REFERENCES

Food and Agriculture Organization of the United Nations. (2023). The state of food and agriculture 2023: Revealing the true cost of food to transform agrifood systems. FAO.

IFOAM – Organics International. (2022). The world of organic agriculture: Statistics and emerging trends 2022. Research Institute of Organic Agriculture (FiBL) & IFOAM.

O'zbekiston Respublikasi Statistika agentligi. (2023). Qishloq xo'jaligi statistik to'plami. Toshkent: O'zbekiston Respublikasi Statistika agentligi.

Willer, H., & Lernoud, J. (2019). Organic agriculture worldwide: Current statistics. FiBL Report.

World Bank. (2021). Uzbekistan agriculture sector review: Modernizing agriculture for a diversified economy. World Bank Group.

To'raboyeva, K. U. (2020). Barqaror qishloq xo'jaligi rivojlanishining nazariy-metodologik asoslari. Iqtisodiyot va innovatsion texnologiyalar jurnali, 4, 112–120.

THE ROLE AND SIGNIFICANCE OF MOBILE BANKING IN THE DEVELOPMENT OF DIGITAL RETAIL SERVICES IN COMMERCIAL BANKS

Gofurjon Gulomjonovich Akhmedov

Independent Researcher, Andijan State Technical Institute

Abstract. *This paper evaluates the role of mobile banking in the development of digital retail services in commercial banks using official data on Uzbekistan's banking system for 2020–2025. It analyses trends in the number of remote banking users and the volume of transactions conducted through mobile applications. The paper demonstrates that registered-user figures alone do not fully reflect mobile-channel performance. A monitoring approach based on active usage, service depth, transaction completion, reliability, and security is proposed, together with practical recommendations for improving mobile banking.*

Keywords: *commercial bank, digital retail services, mobile banking, remote banking services, mobile application, digital identification, retail transactions, cybersecurity.*

INTRODUCTION

Mobile banking is a digital delivery channel that enables customers to manage bank accounts, make payments and money transfers, open deposits, convert currencies, obtain microloans, repay loans, and manage bank cards through a smartphone. Its role is not limited to providing retail banking products outside physical branches. A mobile application is increasingly becoming the principal point of day-to-day customer interaction, product sales, information exchange, and service-quality management.

International research shows that convenience, perceived usefulness, trust, security, and perceived risk influence the adoption of mobile banking (Shaikh & Karjaluoto, 2015). International approaches to financial inclusion emphasise that digital technologies can broaden access to and use of transaction accounts, while technological and consumer-protection risks must be managed simultaneously (CPMI & World Bank Group, 2020). Therefore, the development of mobile

banking should be assessed not merely by application downloads or registrations, but by the outcomes of active and secure service usage.

The purpose of this study is to identify the functions of mobile banking in developing digital retail services in commercial banks, assess its growth dynamics in Uzbekistan, and formulate practical recommendations for improving the mobile channel.

RESEARCH METHODOLOGY

The study employs systems analysis, comparative analysis, time-series analysis, and logical generalisation. Its information base comprises the annual reports of the Central Bank of the Republic of Uzbekistan for 2020–2025. The number of remote banking users and the volume of transactions conducted by individuals through bank mobile applications were selected as the principal dynamic indicators. At the same time, the substantive limitations of these indicators were taken into account: registered accounts may be duplicated across different banks, while transaction volume alone does not measure service quality or customer satisfaction.

RESULTS AND DISCUSSION

Official data indicate that mobile and remote services have become major channels of retail banking. The number of remote banking users rose from 14.5 million at the end of 2020 to 52.9 million at the end of 2024. The volume of transactions conducted by individuals through bank mobile applications increased from UZS 58.1 trillion in 2021 to UZS 645.6 trillion in 2025. This represents an 11.1-fold increase over four years. In 2025 alone, transaction volume grew by 1.6 times (Central Bank of the Republic of Uzbekistan, 2021–2025).

Table 1.

Development dynamics of remote and mobile banking services in Uzbekistan

Year	Remote banking users, million	Transactions via mobile applications, UZS trillion
2020	14.5	52,2
2021	20.2	58.1
2022	30.0	145.8
2023	44.1	250.1

2024	52.9	396.7
2025	55,7	645.6

Source: Compiled by the author based on the annual reports of the Central Bank of the Republic of Uzbekistan for 2020–2025. Note: the number of users is reported as of the end of the respective year.

The composition of transactions indicates that the mobile application is evolving from a payment instrument into a sales channel for retail banking products. In 2025, transactions conducted through mobile applications included UZS 99.3 trillion in online deposits, UZS 55.8 trillion in foreign-exchange conversions, UZS 38.6 trillion in microloans, and UZS 46.7 trillion in loan repayments. In the same year, the number of bank cards in circulation reached 68.2 million, while transactions through mobile applications amounted to UZS 645.6 trillion (Central Bank of the Republic of Uzbekistan, 2025). These figures show that, beyond meeting customers' payment needs, the mobile channel increasingly integrates savings, credit, and foreign-exchange services.

The role of mobile banking in digital retail services is manifested in four functions. First, it serves as a distribution channel that provides banking services without temporal or geographical constraints. Second, the application functions as a sales channel for deposit, microloan, foreign-exchange, and card products. Third, data on customer behaviour enable banks to personalise services and develop targeted offers. Fourth, the integrated management of customer requests, notifications, and security confirmations through the mobile channel ensures continuous interaction between the bank and its customers.

However, growth in itself does not necessarily imply an improvement in service quality. A registered user may not access the application regularly, may use only money-transfer services, or may be unable to complete a transaction because of a technical failure. Banks should therefore assess mobile-banking performance through indicators of active usage and service depth.

Table 2.

Proposed indicators for managing mobile banking performance

Indicator	Managerial interpretation
Monthly active-user ratio	Shows the proportion of registered customers who actively use the application.

Transaction completion rate	Measures the proportion of initiated transactions completed successfully.
Service depth	Measures the number of products used by an active customer.
Digital sales share	Shows the proportion of deposits, cards, and loans sold through the mobile channel.
Reliability and security	Monitors the frequency of outages, declined transactions, and fraud incidents.

The proposed indicators enable banks to monitor the reach of a mobile application, its actual usage, its contribution to product sales, and its associated risks in an integrated manner. Key security measures include biometric identification when a customer logs in from a new device or resets a password, session-based anti-fraud controls, device-risk detection, and risk-adjusted transaction limits. The Central Bank's 2025 annual report notes the strengthening of measures such as telecommunications anti-fraud controls, session-based anti-fraud systems, and Face ID (Central Bank of the Republic of Uzbekistan, 2025).

CONCLUSIONS AND RECOMMENDATIONS

The analysis shows that mobile banking has become a principal distribution and sales channel for digital retail services in Uzbekistan's commercial banks. Mobile applications integrate deposit, foreign-exchange, credit, and card services. However, the number of registered users and transaction volume are insufficient to provide a comprehensive assessment of mobile-channel quality.

Commercial banks are advised to establish the monthly active-user ratio as a key mobile-banking indicator; deepen the use of digital products beyond payments; monitor transaction completion rates and technical disruptions for each service; develop personalised offers based on customer consent; and apply anti-fraud and biometric protection through a risk-based approach that avoids unnecessary customer friction. These measures will help transform mobile applications from simple payment instruments into full-service digital retail banking platforms.

REFERENCES

Committee on Payments and Market Infrastructures, & World Bank Group. (2020). Payment aspects of financial inclusion in the fintech era. Bank for International Settlements. https://www.bis.org/publications/payment-aspects-financial-inclusion-fintech-era

Central Bank of the Republic of Uzbekistan. (2020–2025). Annual reports for 2020–2025. https://cbu.uz/en/publications/annual-report/

Shaikh, A. A., & Karjaluoto, H. (2015). Mobile banking adoption: A literature review. Telematics and Informatics, 32(1), 129–142. https://doi.org/10.1016/j.tele.2014.05.003

MANAGING PROJECT CASH FLOW IN SMALL IT INTEGRATION FIRMS IN UZBEKISTAN

Shokhzod Gayratov

Finance Manager, Softy LLC

Tashkent, Uzbekistan

Abstract: *Small IT integration firms can pay for licences, equipment and implementation before collecting customer payments. This paper develops a project cash planning framework for such firms in Uzbekistan, combining selected literature with a numerical illustration. The framework links projects to contractual milestones, payment schedules and supporting documents. In a hypothetical UZS 120 million contract, the peak funding requirement falls from UZS 96 million to UZS 60 million with a 30% customer advance, and to UZS 18 million when the advance is combined with a split supplier payment. Delayed customer settlement raises the latter requirement back to UZS 60 million. These calculations demonstrate why managers should assess payment timing and reliability alongside project contribution. The framework supports contract review and weekly liquidity planning. Its effectiveness requires testing with transaction data; the analysis does not estimate causal effects or report observed company results.*

Keywords: *working capital; cash flow forecasting; IT integration; small enterprises; project management; Uzbekistan.*

1 INTRODUCTION

An IT integration contract may combine third-party software licences, hardware and implementation services. For the business model examined here, the supplier requires payment before the customer settles the invoice. The integrator must therefore finance the interval between purchasing the solution and collecting the contract price. A positive expected contribution does not establish that the firm can meet the payments required to deliver the project.

The OECD's 2023 assessment of Uzbekistan identifies limited digital capabilities and gaps in complementary management skills among businesses (OECD, 2023). These findings motivate attention to usable financial information. They do not establish the prevalence of cash shortages among Uzbek IT

integrators, which this paper treats as an application context.

The research question is how a small integrator can identify a contract's funding implications using quotations, invoices and payment records. The contribution is an applied framework connecting commercial terms with dated cash requirements, including the effect of delayed customer settlement.

2 Literature and analytical approach

Deloof (2003) reports a relationship between working capital management and profitability in a sample of large Belgian non-financial firms. The study supports examining receivable and inventory periods, although its estimates cannot be transferred directly to small Uzbek service businesses. Baños-Caballero, García-Teruel and Martínez-Solano (2011) find an inverted U- shaped relationship between working capital investment and performance in UK firms. Their analysis suggests that the benefits of supporting sales must be considered together with the cost of financing the investment.

The OECD (2021) describes skills, financing and interoperability barriers that can limit digital adoption by smaller enterprises. For the present framework, this motivates a modest information requirement: a controlled spreadsheet can be used initially, provided that its records are complete and reconciled. Installing a more complex system would not, by itself, make uncertain receipt dates reliable.

The method is a conceptual design supported by deterministic scenario analysis. The literature supplies context; the payment schedules are constructed assumptions. No interviews, surveys or confidential company records are used. Holding contract value and direct costs constant isolates the arithmetic effect of payment timing, without claiming a measured improvement in business performance.

3 A framework for project cash planning

Each project receives a unique identifier shared by its contract, supplier order, delivery record and payment entries. The register records amounts, currencies, due dates, expected settlement dates, actual payments and an owner for exceptions. Separating due dates from forecast dates keeps late payments visible

instead of treating them as revised contractual commitments.

Managers assess two different quantities. Expected project contribution equals contract revenue less direct project costs, before overheads, tax and financing. The cash schedule tracks when money is expected to enter or leave the business. For each payment event, customer receipts are added to the preceding cumulative balance and supplier and delivery payments are deducted. Starting from zero allocated cash, the largest negative cumulative balance, expressed as a positive amount, is the project's peak funding requirement. The balance is measured before borrowing or other financing flows.

Customer advances belong in the cash schedule when received; they are not automatically earned profit. Similarly, an issued invoice is not a receipt. Deposits, partial payments and refunds should remain separate entries so that a single contract value is never counted twice. Payments across the firm's own bank accounts are internal transfers and must be eliminated when preparing the combined cash forecast.

At company level, schedules are aligned by date and combined with unrestricted opening cash and shared operating payments. Standalone peak deficits cannot simply be added because they may occur on different dates. A weekly review identifies the lowest cash balance and receipts awaiting acceptance or other documents. Same-day settlements require a detailed sequence when an outgoing payment cannot wait for an incoming transfer.

4 Numerical illustration

Consider a hypothetical contract worth UZS 120 million. The supplier charges UZS 84 million, and implementation requires a further UZS 12 million paid on day 30. Delivery is completed on day 30, with final customer settlement planned for day 60. The direct project contribution is UZS24 million, or 20% of revenue. All amounts are constructed for illustration and exclude VAT, other taxes, financing charges, exchange-rate changes and shared overheads.

Scenario A assumes no customer advance: the supplier receives UZS 84 million on day 0, and the customer pays UZS 120 million on day 60. Scenario B

introduces a 30% customer advance of UZS 36 million on day 0, reducing the final customer payment to UZS 84 million. Scenario C retains that advance and splits the supplier payment into UZS 42 million on day 0 and UZS 42 million on day 60, without changing the supplier's total price. These alternatives assume that the relevant terms can be negotiated before the contract is signed.

Table 1

Cumulative project cash balances and funding needs

Scenario	Day 0	Day 30	Day 60	Peak funding
A No customer advance	−84	−96	24	96
B 30% customer advance	−48	−60	24	60
C Advance and split supplier payment	−6	−18	24	18

Note. UZS million; author's calculations using hypothetical values. Balances exclude financing flows. Customer receipts are assumed to clear before supplier payments on the same day.

The customer advance reduces the peak requirement by UZS 36 million, or 37.5%, relative to Scenario A. Combining the advance with supplier credit reduces it by a further UZS 42 million. All three scenarios end with the same UZS 24 million cumulative surplus before financing because their total receipts and costs are identical. Their liquidity requirements differ because the payments occur at different times.

The result for Scenario C depends on settlement reliability. If the final customer payment moves from day 60 to day 90 while the remaining supplier payment stays due on day 60, the cumulative balance falls from minus UZS 18 million to minus UZS 60 million. The peak requirement is then UZS 60 million, and the closing surplus returns to UZS 24 million only when the customer pays. This stress case assumes no additional interest or late charges; including them would reduce the closing surplus.

5 Managerial implications

The example supports reviewing payment terms before approving a sale.

Sales staff can confirm the customer's acceptance and settlement conditions; procurement can document the supplier's payment requirements; finance can then identify the amount and duration of the resulting cash commitment. Where the projected deficit exceeds available funding after a minimum cash reserve, management must arrange funding, negotiate permissible changes or reconsider the timing of the project.

An advance or longer supplier credit may have a commercial cost. A customer may request a discount, and a supplier may charge a higher price or refuse deferred payment. Those changes should be entered into both the contribution calculation and the cash schedule. A lower funding

requirement is useful only if the resulting contract remains commercially acceptable. The scenarios do not imply that every customer or supplier will agree to the same terms.

A weekly routine should compare actual bank movements with the previous forecast and preserve an explanation for material changes. If a receipt moves because an acceptance document remains unsigned, a named project owner should resolve that issue. This creates a link between the cash forecast and delivery work. Merely moving the forecast date would conceal the source of the delay and make repeated forecasting errors difficult to diagnose.

For evaluation, a firm could track the absolute difference between forecast and actual weekly receipts, the value of overdue customer balances, and the incidence of unplanned funding requests. Improvements in these measures would provide evidence about the usefulness of the workflow. An initial pilot should retain the original forecasts and follow projects through final settlement, including disputed and unsuccessful cases.

6. LIMITATIONS AND CONCLUSION

The illustration represents one simplified contract and does not describe observed market averages. It excludes tax timing, foreign-currency liabilities, default, warranty obligations and shared overheads. Firms applying the framework must add these cash flows where relevant and use their own contractual evidence. The literature cited provides a conceptual basis rather than current empirical estimates for Uzbekistan’s IT integration sector.

Further research could compare forecasts with realised cash flows across integrators and contract types. Evaluations would need to account for project size, customer mix and financing access before attributing improvement to the framework. Interviews could identify barriers involving data quality, negotiating power or internal responsibilities.

Project contribution and funding needs answer different management

questions. In the constructed example, changing payment terms leaves the contribution unchanged while materially reducing the planned cash deficit; delayed settlement can reverse much of that benefit. A dated project register, reconciled with actual payments and reviewed alongside delivery milestones, provides a practical basis for making these trade-offs explicit.

REFERENCES

Baños-Caballero, S., García-Teruel, P. J., & Martínez-Solano, P. (2011). Working capital management, corporate performance, and financial constraints (Working Paper No. 627/2011). Fundación de las Cajas de Ahorros. https://www.funcas.es/wp-content/uploads/Migracion/Publicaciones/PDF/1719.pdf

Deloof, M. (2003). Does working capital management affect profitability of Belgian firms? Journal of Business Finance & Accounting, 30(3–4), 573–588. https://doi.org/10.1111/1468-5957.00008

OECD. (2021). The digital transformation of SMEs. OECD Publishing. https://doi.org/10.1787/bdb9256a-en

OECD. (2023). Digital skills for private sector competitiveness in Uzbekistan. OECD Publishing. https://doi.org/10.1787/6c54f447-en

THE IMPORTANCE OF MARKETING RESEARCH IN THE MEDICAL SERVICES MARKET

Hamidova Maftuna Boburjon qizi

PhD Candidate Tashkent State University of Economics

Mail.tsue.uz

Annotation. *This paper substantiates the importance of marketing research in the medical services market. Drawing on global and national statistics, it shows that rapid market growth, digitalisation, and the expansion of Uzbekistan's private healthcare sector and state medical insurance system are increasing the need for systematic patient-behaviour research. The paper reviews global market dynamics, the formation of Uzbekistan's market, the role of marketing research in service quality and competitiveness, and the post-pandemic significance of digital tools. A research gap is identified regarding the limited use of marketing research among small private clinics in Uzbekistan's regions.*

Keywords: *marketing research; medical services market; healthcare marketing; digital health; patient satisfaction; service quality; Uzbekistan; state medical insurance; competitiveness.*

INTRODUCTION

The medical services market occupies an increasingly prominent place in the global economy, as population health has become both a strategic priority for governments and a fast-growing sector for private investors. Marketing research acquires particular significance here because a medical service is intangible, its outcome cannot be verified in advance, and patient behaviour is shaped by information asymmetry between provider and patient. Consequently, conventional marketing research tools require substantial adaptation for healthcare. This paper reviews the global and national context that makes marketing research indispensable for medical institutions and identifies gaps that remain insufficiently studied in the case of Uzbekistan.

MAIN PART

Global dynamics of the medical services market. The global healthcare services market was valued at USD 8,778.7 billion in 2024 and reached an estimated USD 9,255.8 billion in 2025 [1], continuing to expand at a forecast CAGR of about 4.9% through 2029. Growth is reinforced by an even faster-expanding digital health segment, projected to grow from USD 387.8 billion in 2025 to USD 2.19 trillion by 2034 at a CAGR of 21.2% [2]. Global health spending reached USD 9.8 trillion in 2021, or 10.3% of global GDP [3]. These indicators are summarised in Table 1.

Table 1.

Selected global healthcare and digital health market indicators

Indicator	Value
Global healthcare services market size, 2024	USD 8,778.7 billion
Global healthcare services market size, 2025	USD 9,255.8 billion
Forecast CAGR, healthcare services (2025-2029)	4.9%
Global digital health market size, 2024	USD 312.9 billion
Global digital health market size, 2025	USD 387.8 billion
Forecast CAGR, digital health (2025-2034)	21.2%
Average global health expenditure, share of GDP (2021)	10.3%

Source: compiled by the author based on [1], [2] and [3]

Formation of the medical services market in Uzbekistan. Uzbekistan's medical services market has undergone marked structural change over the past decade, driven by private-sector expansion and healthcare-financing reforms. The number of private medical institutions increased steadily from 575 in 2019 to 675 as of 1 January 2023 [4], as shown in Figure 1. This expansion has been accompanied by the phased introduction of a state medical insurance system - piloted in Sirdaryo region in 2020-2021, extended to Tashkent city in 2023-2024 and Karakalpakstan in 2025, with nationwide completion planned by the end of 2026 - under which the number of contracted private clinics nearly doubled, from 49 in 2024 to 86 in 2025 [5][6]. For 2025, the state budget allocated approximately 43.3 trillion UZS

to healthcare [6], around 2.3% of the country's GDP of roughly 1,849.7 trillion UZS that year [7].

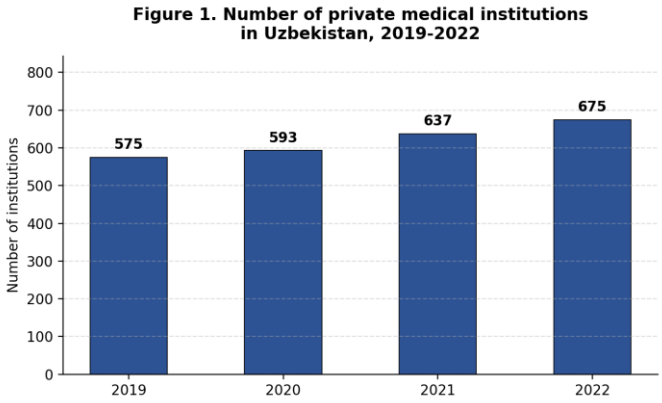


Figure 1. Number of private medical institutions in Uzbekistan, 2019-2022. Source: [4]

Marketing research, service quality and digitalisation. As competition intensifies, marketing research is increasingly used to identify patient needs, segment the market and manage service quality. The SERVQUAL framework, evaluating reliability, responsiveness, assurance, empathy and tangibles, remains a foundational tool for measuring patient satisfaction [8], complemented internationally by metrics such as the Net Promoter Score. Providers in countries such as the United States and South Korea routinely combine such tools with CRM systems [9], a level of sophistication not yet common among Uzbekistan's regional private clinics. The COVID-19 pandemic further accelerated the adoption of telemedicine and online platforms for studying patient behaviour, a shift that has persisted well beyond its acute phase [10] and now requires marketing research to analyse large volumes of behavioural data rather than relying solely on traditional surveys [11].

Research gaps. Despite extensive international literature on healthcare marketing, several aspects remain understudied for Uzbekistan specifically: the actual extent to which regional private clinics apply structured marketing research rather than informal feedback; the methodological adaptation of frameworks such as SERVQUAL and NPS to

the national context; and the marketing implications of the ongoing transition to state medical insurance for competition between public and private providers. These gaps justify a dedicated theoretical and empirical investigation, which forms the subject of subsequent stages of this research.

CONCLUSION

The medical services market, both globally and in Uzbekistan, is expanding rapidly and undergoing significant structural and digital transformation. The intangibility of medical services, the information asymmetry between patients and providers, and the accelerating shift toward digital and insurance-based healthcare delivery all point to a growing need for systematic marketing research. Yet the evidence reviewed here indicates that Uzbekistan's regional private providers largely lack marketing research practices comparable to international standards, a gap that the next stages of this research aim to address through a theoretical and methodological framework adapted to the national market.

REFERENCES

[1] The Business Research Company. Healthcare Services Global Market Report 2025. 2025. Available at: https://www.thebusinessresearchcompany.com

[2] Global Market Insights. Digital Health Market Size & Share, 2025-2034. 2025. Available at: https://www.gminsights.com

[3] World Health Organization. WHO Calls on Governments for Urgent Action to Invest in Universal Health Coverage. 2023. Available at: https://www.who.int

[4] O'zbekiston Respublikasi Milliy statistika qo'mitasi (Stat.uz). O'zbekiston Respublikasida xususiy tibbiyot muassasalari soni ko'paymoqda. 2023. Available at: https://stat.uz

[5] Gazeta.uz. O'zbekistonda davlat tibbiy sug'urtasi tizimi qachondan joriy etilishi ma'lum qilindi. 2024. Available at: https://www.gazeta.uz

[6] Gazeta.uz. O'zbekistonda tibbiy sug'urtaga o'tish vaqt talab qiladi - SSV. 2026. Available at: https://www.gazeta.uz

[7] O'zbekiston Respublikasi Milliy statistika qo'mitasi (Stat.uz). O'zbekiston Respublikasi yalpi ichki mahsuloti, 2025-yil yanvar-dekabr. 2026. Available at: https://stat.uz

[8] Parasuraman A., Zeithaml V.A., Berry L.L. SERVQUAL: A Multiple-Item Scale for Measuring Consumer Perceptions of Service Quality. Journal of Retailing. 1988. Vol. 64, No. 1. P. 12-40.

[9] Berkowitz E.N. Essentials of Health Care Marketing. 4th ed. Jones & Bartlett Learning, 2016.

[10] Arizton Advisory & Intelligence. Global Telemedicine and Digital Health Market Research Report 2026-2031. 2026. Available at: https://www.arizton.com

[11] Chandra A., Paul J., Chavan M. Healthcare Marketing: A Bibliometric Review and Research Agenda. Journal of Strategic Marketing. 2022. Vol. 30, No. 3. P. 231-2

IMPROVING THE FINANCIAL SUPPORT AND DEVELOPMENT MECHANISMS OF WOMEN'S ENTREPRENEURSHIP IN UZBEKISTAN BASED ON INTERNATIONAL EXPERIENCE

Author: Umurzakova Dildora Sultonmakhmudovna

Affiliation: *PhD Researcher, University of Business and Science*

E-mail: dumurzakova5@gmail.com

ORCID: 0009-0008-4660-0104

Abstract. This comprehensive study investigates the structural, institutional, and financial frameworks governing women's entrepreneurship in the Republic of Uzbekistan. Utilizing an empirical and comparative methodology, the paper evaluates the existing "gender credit gap" and the systemic barriers that female entrepreneurs encounter when accessing institutional capital. By contrasting domestic mechanisms against highly successful frameworks in the United States (SBA), South Korea (KWEA), and Western Europe, this research identifies key execution bottlenecks within the Uzbek banking sector—specifically, collateral deficits and rigid credit scoring models. The paper proposes an optimized financial architecture incorporating credit guarantee enhancements up to 85%, specialized "gender-smart" banking lines, and alternative Fintech/Islamic microfinance instruments. Quantitative projections indicate that implementing these mechanisms can accelerate female-led micro-business transitions into robust small-to-medium enterprises (SMEs) by up to 35% over a multi-year horizon.

Keywords: women's entrepreneurship, financial mechanisms, microfinance, credit guarantee scheme, gender credit gap, banking architecture, Uzbekistan.

1. INTRODUCTION.

In the contemporary global economic landscape, fostering the economic empowerment of women is no longer merely a matter of social equity; it is a fundamental prerequisite for achieving sustainable macroeconomic growth. This objective aligns directly with the United Nations Sustainable Development Goal 5 (Gender Equality) and Goal 8 (Decent Work and Economic Growth).

In the Republic of Uzbekistan, the institutional transformation initiated under national development strategies has explicitly positioned women's entrepreneurship as a core pillar of structural economic diversification. Over the past decade, the country has introduced unprecedented legislative measures, including subsidized credit lines and dedicated state councils.

However, a persistent divergence remains between the macro-level policy objectives and the micro-level realities faced by female business owners. The primary constraint resides within the financial transmission mechanism. Traditional commercial banks in developing economies operate under rigid risk-averse paradigms, utilizing standardized collateral-heavy credit models. Because female-led enterprises are disproportionately concentrated within the micro, small, and informal sectors, they are frequently marginalized during institutional capital allocation.

This paper critically evaluates the current state of financial support mechanisms for female entrepreneurship in Uzbekistan, performs a cross-national comparative analysis with developed models, and introduces an optimized mathematical and structural model to bridge the prevailing gender credit gap.

2. METHODOLOGY. This study employs a multi-faceted mixed-methods research design, blending qualitative institutional analysis with quantitative financial modeling:

- Systematic Literature Review: Analyzing theoretical frameworks surrounding female capital constraints in transition economies based on reports from the World Bank, International Finance Corporation (IFC), and United Nations Development Programme (UNDP).
- Empirical Data Evaluation: Processing operational and credit portfolio data spanning the 2021–2025 period, obtained from the Central Bank of the Republic of Uzbekistan and the Ministry of Economy and Finance.
- Comparative Macro-Analysis (Komparativistika): Benchmarking Uzbekistan’s institutional credit mechanisms against the United States Small Business Administration (SBA) frameworks and South Korea's KWEA public procurement models.
- Mathematical Projection: Utilizing linear modeling to project the impact of varying credit guarantee percentages on bank risk premiums and subsequent loan approval rates for female borrowers.

3. RESULTS AND RECENT EMPIRICAL ANALYSIS. An empirical evaluation of Uzbekistan's financial market reveals a structural asymmetry. While women account for approximately 38.5% of registered individual entrepreneurs and small business owners nationwide, their share within the aggregate commercial banking loan portfolio remains capped at 16.2%. This quantitative discrepancy defines the *Gender Credit Gap*.

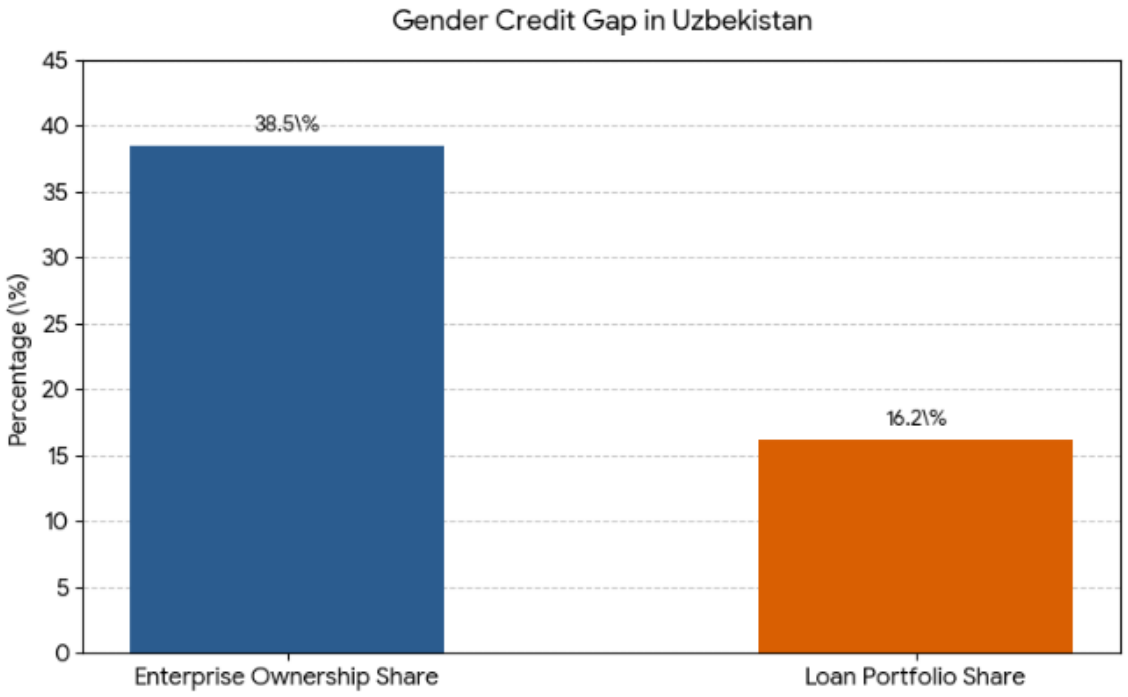


Figure 1. The Dynamics of Loan Rejection Factors [1]

To understand why this gap persists, an analysis of loan rejection data for female applicants indicates that standard operational criteria disproportionately penalize women. The primary reasons for commercial loan rejections among female entrepreneurs are categorized as follows:

- Collateral Insufficiency (Pledge Deficit): 54% of all rejections.
- Asymmetric Credit History / Lack of Track Record: 22% of rejections.
- Unviable Business Plan Formatting (Financial Illiteracy): 14% of rejections.
- Other Macroeconomic/Sectoral Risks: 10% of rejections.

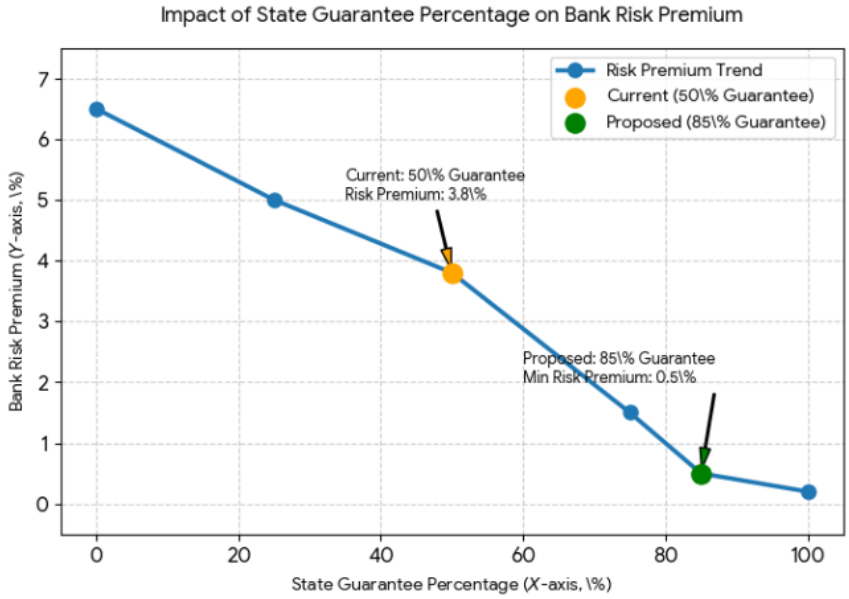
Table 1: Comprehensive Cross-Country Comparison of Women's Financial Support Architecture

Diagnostic Dimensions	Uzbekistan (Current State)	United States (SBA Framework)	South Korea (KWEA Model)

Primary Financial Vehicle	State-driven concessional programs (e.g., Family Entrepreneurship)	Government-guaranteed commercial bank loans (7(a) & Microloan)	Specialized state funds + corporate-civic procurement integration
Average Guarantee Cap	Maximum 50% through the Entrepreneurship Development Co.	Up to 85% federal guarantee on loans under $150,000	Variable, supported by extensive tax credits and state indemnities
Collateral Substitute	Local neighborhood recommendations/ Personal guarantors	Government backing acts as the primary risk mitigant	Institutional scoring based on technical innovation indicators
Target Sector Alignment	Predominantly handicraft, agriculture, and micro-retail	Technology, professional services, manufacturing, and trade	High-tech manufacturing, software development, and export services
Financial Literacy Integration	Fragmented, non-mandatory workshops	Mandatory institutional mentoring via SCORE and WBC networks	Continuous business acceleration pipelines built into the credit line

4. DISCUSSION AND THEORETICAL FRAMEWORK. The empirical data confirms that the structural bottleneck in Uzbekistan is not a lack of liquidity within the banking sector, but rather the Risk Transmission Mechanism. Under Basel III capital adequacy requirements, Uzbek banks assign high risk-weights to unsecured small business loans. Since real estate and high-value fixed assets in Uzbekistan are historically and socioeconomically registered under male heads of households, women face a natural systemic disadvantage during asset-backed lending assessments.

To counteract this, the domestic system must transition from an Asset-Backed Lending Paradigm to a Cash-Flow and Guarantee-Backed Paradigm. If the Entrepreneurship Development Company elevates its credit guarantee threshold specifically for female-owned enterprises from 50% to 85% (mirroring the US SBA model), the risk profile shifts dynamically.



Mathematical Formulation of Bank Risk Premium Mitigation:

Let the risk premium RP demanded by a commercial bank be expressed as:

\(RP=f(PD\times LGD)\)Where: PD = Probability of Default of the entrepreneur.

LGD = Loss Given Default, which is directly tied to available collateral or guarantees.

By introducing an 85% sovereign state guarantee (G = 0.85), the effective LGD drops to: \(LGD_{effective}=LGD\times (1-G)=0.15\times LGD\)

This drastic reduction in potential credit loss allows commercial banks to lower interest rates and eliminate stringent asset-pledge requirements, effectively shifting the equilibrium point in favor of the borrower.

5. CONCLUSION AND POLICY RECOMMENDATIONS

To structurally optimize the financial support and development mechanisms for women's entrepreneurship in Uzbekistan, this paper outlines the following strategic interventions:

- **Institutionalizing the "We-Finance Code" Integration:** The Central Bank of Uzbekistan must move beyond voluntary compliance. It should mandate that commercial banking institutions publish gender-disaggregated credit data quarterly, fostering transparency and competitive market behavior.
- **Restructuring the State Guarantee Model:** Legally amend the charter of the Entrepreneurship Development Company to authorize an **85% credit risk absorption** for verified female-led start-ups, particularly in rural provinces (e.g., Surxondaryo, Qashqadaryo, and the Republic of Karakalpakstan).
- **Introduction of "Gender-Smart" FinTech Instruments:** Support the deployment of specialized crowdfunding platforms and digital micro-lending apps that utilize alternative data scoring (e.g., mobile wallet utilization, utility payment consistency) instead of traditional credit histories.
- **Deploying Islamic Finance Windows:** Establish interest-free microfinance channels based on *Murabaha* (cost-plus markup) and *Qard al-Hasan* (benevolent loans) to engage culturally conservative segments of the rural female population who abstain from conventional interest-bearing loans.

REFERENCES

1. Umurzakova, D. S. (2024). Financing Women's Entrepreneurship: A Comparative Analysis. *American Journal of Business Practice*, 4(2), 45-52.
2. UNDP Uzbekistan. (2023). *Women's Entrepreneurship in Uzbekistan: Assessment and Recommendations*. Tashkent: UNDP Publications.
3. World Bank. (2025). *Female Entrepreneurship Resource Point: Financial Architecture and Global Trends*. Washington DC: The World Bank Group.
4. Central Bank of the Republic of Uzbekistan. (2024). *Annual Financial Stability Report*. Tashkent: CBU.
5. International Finance Corporation (IFC). (2023). *Bridging the Gender Credit Gap in Transition Economies*. Istanbul: IFC Europe & Central Asia Department.

6. Koren Women Economic Association (KWEA). (2024). *Statistical Yearbook on Female-Led Enterprise Performance*. Seoul: KWEA Press.

INTELLIGENT CRM SYSTEMS AS A TOOL FOR IMPROVING SALES EFFICIENCY AND SME FINANCING IN COMMERCIAL BANKS

Salimova Ziyoda Rustamjon qizi

Researcher of TSUE

Email: ziyoda_0108@mail.ru

ORCID: 0009-0009-8930-8688

Abstract: *Most commercial banks still rely on CRM systems that mainly store customer records and produce reports. These systems do little to turn data into forward-looking decisions. The present paper sets out a conceptual framework for using intelligent CRM to raise the effectiveness of sales and financing work with small and medium-sized enterprises, with particular attention to the digital changes under way in Uzbekistan's banking sector. The study draws on recent literature, a comparison of traditional and intelligent CRM approaches, and an examination of current developments in the country's banking market. A five-layer model is put forward, together with practical recommendations and a set of performance indicators. The proposed approach is intended to help banks move from reactive servicing toward a more predictive relationship with SME clients.*

Keywords: *intelligent CRM; SME financing; commercial banks; artificial intelligence; predictive analytics; digital banking; Uzbekistan; next-best-offer; customer lifetime value.*

1. INTRODUCTION

Small and medium-sized enterprises form a large part of the customer base of most commercial banks. They need current accounts, working-capital loans, longer-term investment finance, acquiring services, payroll schemes and remote banking facilities. Yet the needs of these firms vary widely. Differences in financial behaviour, uneven information and the sheer number of clients make purely manual relationship management difficult to sustain.

World Bank and IFC assessments indicate that SMEs contribute substantially to employment and output, while access to formal bank credit remains limited. Only a minority of smaller firms report having a bank loan, and the overall financing gap is measured in billions of dollars (World Bank, 2025).

Digital channels have expanded quickly in Uzbekistan. According to the Central Bank of the Republic of Uzbekistan, more than 74 million customers were using remote banking systems by 1 October 2025. This growth produces large volumes of transactional and behavioural data. The difficulty lies not in collecting the data but in converting it into decisions that improve sales results and financing offers.

The central research problem is therefore practical as well as theoretical: how can fragmented customer, transactional and behavioural information be transformed into concrete recommendations and automated actions? The sequence can be stated as data → information → analytics → intelligent recommendation → managerial action → economic outcome. Conventional CRM systems usually stop at the first two or three steps. They rarely reach the stage of automated decision support that produces measurable results.

The aim of this paper is to develop a conceptual approach to intelligent CRM that can raise the efficiency of SME sales and financing in commercial banks, taking into account the digital transformation under way in Uzbekistan.

Five tasks follow from this aim: to clarify what distinguishes intelligent CRM from earlier forms; to examine the role of AI, Big Data and predictive analytics in managing SME relationships; to analyse how such systems affect sales processes and financing support; to construct a five-layer conceptual model; and to outline practical steps for banks operating in Uzbekistan.

The work rests on a review of literature published mainly between 2022 and 2026, a comparison of CRM generations, an overview of international practice, and an examination of recent developments in Uzbekistan's banking sector. Conceptual modelling and logical synthesis are the main methods employed. No original empirical dataset is analysed, and all statistical references are taken from published official sources.

2. Evolution of CRM Systems in Banking

CRM systems in banking have passed through three recognisable stages.

Traditional CRM concentrated on storing customer details, logging contacts, managing sales pipelines and producing reports. Its perspective is largely backward-looking: it records what has already happened.

Digital CRM added multichannel integration. Data from internet banking, mobile applications, websites and contact centres could be brought together into a more complete customer profile. Operational coordination improved, but the analytical layer remained comparatively thin.

Intelligent CRM introduces a different logic. The system is expected not only to store and display information but also to interpret patterns, forecast behaviour and generate recommendations. Artificial intelligence, machine learning, Big Data techniques and predictive models become integral rather than optional. For banks serving large numbers of SME clients this shift is strategically important, because it moves the institution from documenting past interactions toward anticipating future needs.

Table 1 summarises the main contrasts.

Table 1. Comparison of traditional/digital and intelligent CRM[6]

Traditional / Digital CRM	Intelligent CRM
Historical data only	Historical, real-time and predictive data
Manual segmentation	AI-driven segmentation

[6] *Compiled by the author on the basis of the literature review*

Manual lead assignment	Automated scoring and routing
Reactive sales approach	Proactive and predictive sales
Standard product offers	Personalised next-best-offer
Descriptive reports	Predictive analytics
Manual follow-up	Automated triggers and workflows
Historical credit data	Alternative and behavioural signals
Periodic reviews	Continuous monitoring
Product-centred logic	Customer-centred logic

The comparison presented in Table 1 shows a clear shift in the logic of customer relationship management. While traditional and digital CRM systems remain largely retrospective and product-oriented, intelligent CRM is built around real-time data, predictive models and automated decision support. This change is particularly relevant for SME banking: the volume of clients is high, their needs are heterogeneous, and relationship managers cannot process every signal manually. Automated scoring, continuous monitoring and personalised offers therefore become practical tools rather than optional enhancements.

Intelligent CRM and SME Sales Efficiency

In the conventional model a customer approaches the bank, the relationship manager assesses the request and an offer is prepared. The process is reactive. Intelligent CRM reverses the sequence. Behavioural and transactional signals are monitored continuously so that a potential need can be identified before the customer makes contact.

The practical chain looks roughly as follows: customer data are collected and integrated; clients are segmented; leads are scored; a probable need is identified; a next-best-offer is generated; the case is routed to the appropriate manager; a sale or financing discussion takes place; subsequent offers and retention measures follow.

Several concrete capabilities become available. Segmentation can incorporate turnover patterns, product usage and digital-channel activity rather than relying solely on firm size or industry codes. Lead scoring ranks

opportunities by conversion probability, which is useful when managers face large volumes of potential contacts. Next-best-offer models select the product or financing arrangement most consistent with the observed behaviour. Automated triggers can open tasks when, for example, account turnover declines sharply or payment activity rises.

Taken together, these features allow the bank to move from "selling a product when the customer asks" to "recognising a need and proposing a solution at the right moment." Response times shorten and the relevance of offers tends to improve.

Intelligent CRM as Support for SME Financing

The same logic applies to financing. The traditional sequence begins with a formal application, continues with document collection and financial analysis, and ends with a credit decision. An intelligent CRM linked to transactional systems can surface early signals of a possible financing need — changes in turnover, seasonal payment patterns, shifts in the structure of counterparties or increased use of certain banking services.

Possible functions include detection of potential demand, analysis of cash-flow dynamics, incorporation of permitted alternative data, generation of preliminary offers, automatic task creation for managers, transfer of relevant information to credit-scoring engines, ongoing behavioural monitoring and early-warning alerts.

One point must be stressed. Intelligent CRM is not a substitute for formal credit scoring or regulatory underwriting procedures. It serves as a decision-support layer that helps identify demand, prepare the customer and equip the relationship manager with timely information. The final credit decision remains inside the bank's established risk and compliance framework. A simplified process path would be: CRM data → behavioural analysis → need identification → preliminary offer → formal credit scoring → credit decision.

Conceptual Model for Commercial Banks in Uzbekistan

Uzbekistan's banking market has seen rapid digital expansion. Central Bank statistics show that remote-banking users exceeded 74 million by early October 2025. Remote lending volumes and electronic payments have also risen. At the same time, World Bank and IFC assessments continue to point to a substantial SME financing gap (World Bank, 2025).

Against this background a five-layer model is proposed.

Data Layer. CRM records, account and transaction data, digital-channel activity, interaction history and permitted alternative sources are brought together into a single customer view.

Analytics Layer. Big Data infrastructure, machine-learning models and predictive techniques convert the assembled data into patterns and forecasts.

Intelligence Layer. Dynamic segmentation, lead scoring, propensity models, next-best-offer engines, behavioural triggers and customer-lifetime-value estimates are produced.

Sales and Financing Layer. Leads are distributed, personalised offers are generated, potential financing needs are flagged, tasks are assigned to managers, and supporting information is supplied to the credit process — without replacing formal underwriting.

Performance Layer. Conversion rates, response times, sales productivity, financing conversion, cross-sell ratios, retention, customer lifetime value and the share of automated processes are monitored.

The layers form a closed loop: new data feed the analytics, analytics shape recommendations, recommendations drive actions, results are measured and the cycle continues. This closed character distinguishes the model from earlier CRM designs that largely stopped at data storage and basic reporting. The framework remains conceptual and would need to be adapted to each bank's data architecture and regulatory constraints.

Practical Recommendations and Indicators

1. Build a unified digital profile for each SME client. Fragmented data across core systems, digital channels and legacy CRM modules remain a common obstacle. Integration through APIs, clear data-quality rules and confidentiality safeguards can produce a single workable view. Useful indicators include profile completeness, the proportion of sources successfully linked, and the time a manager needs to retrieve key information.

2. Introduce AI-based lead scoring and automated distribution. When the volume of potential contacts is large, manual ranking becomes unreliable. Propensity models and routing rules that take account of manager specialisation and current workload can raise conversion and reduce idle time. Indicators: lead conversion rate, average response time, productivity per manager, and the share of leads assigned automatically.

3. Deploy next-best-offer models. Generic product campaigns often miss the mark. Models that incorporate behavioural context and lifetime-value estimates can generate more relevant suggestions, delivered either in real time through digital channels or as batch recommendations to managers. Indicators: cross-sell ratio, offer acceptance rate, products per SME customer, and the trajectory of customer lifetime value.

4. Install behavioural triggers for financing needs. Waiting for the customer to apply is a reactive stance. Continuous monitoring of turnover and payment patterns, combined with anomaly-detection rules, can surface potential demand earlier. Indicators: share of financing applications initiated by system triggers, time from signal to first contact, and financing conversion rate.

5. Connect the CRM to digital banking platforms, Open Banking interfaces and credit-scoring engines. Siloed systems limit end-to-end digital journeys. Secure API links and process orchestration, aligned with emerging Open Banking standards, can reduce friction while leaving formal

underwriting intact. Indicators: share of automated process steps, financing-application conversion, and cost per acquisition.

These steps are interdependent. Data governance, model-risk controls, algorithmic transparency and staff training are necessary conditions for any of them to deliver results.

3. SCIENTIFIC NOVELTY

Three elements of novelty are claimed. First, the paper presents intelligent CRM as an integrated digital infrastructure that links customer data, AI analytics, sales management and the early identification of SME financing needs. Second, it outlines a concrete mechanism for moving from reactive to proactive relationship management through the combined use of segmentation, lead scoring, next-best-offer models and behavioural triggers. Third, it proposes a balanced set of performance indicators that cover sales results, processing speed, financing outcomes, retention and the degree of automation.

4. CONCLUSION

CRM systems in banking are gradually changing their role — from repositories of customer information to instruments of intelligent decision support. For the SME segment the change is especially relevant: the number of clients is large and their needs are diverse, so purely manual management quickly reaches its limits.

When customer, transactional and behavioural data are combined with AI and predictive techniques, banks gain the capacity to anticipate needs rather than merely respond to them. The five-layer model described above — Data, Analytics, Intelligence, Sales & Financing, and Performance — treats CRM as a continuous cycle rather than a static database.

For banks operating in Uzbekistan the most immediate steps appear to be the creation of unified SME profiles, the introduction of AI-supported lead scoring and routing, the use of next-best-offer models, and the installation of

behavioural triggers for financing needs. Any deployment of AI and alternative data must, of course, respect requirements of data quality, privacy, model transparency and regulatory compliance.

The framework remains conceptual. Empirical testing on the data of individual banks would be a natural next stage of research.

REFERENCES

Alliance for Financial Inclusion. (2025). Alternative data for credit scoring. AFI.

Bu, Y., Du, X., Wang, Y., Liu, S., Tang, M., & Li, H. (2024). Digital inclusive finance: A lever for SME financing? International Review of Financial Analysis, 93, 103115. https://doi.org/10.1016/j.irfa.2024.103115

Central Bank of the Republic of Uzbekistan. (2025). Number of customers applied remote banking systems as of October 1, 2025. https://cbu.uz/en/statistics/paysistem/

Central Bank of the Republic of Uzbekistan. (2025/2026). Annual reports and statistical bulletins. https://cbu.uz/

Cornelli, G., Frost, J., Gambacorta, L., & Jagtiani, J. (2024). The impact of fintech lending on credit access for U.S. small businesses. Journal of Financial Stability, 73, 101290. https://doi.org/10.1016/j.jfs.2024.101290

Evalogical. (2026). The role of AI in banking CRM: How predictive models drive cross-sell and growth. https://evalogical.com/blog/the-role-of-ai-in-banking-crm-how-predictive-models-drive-crosssell

Kotios, D., Makridis, G., Walser, S., Kyriazis, D., & Monferrino, V. (2022). Personalized finance management for SMEs. In L. A. Petropoulos & G. A. Tsihrintzis (Eds.), Big data and artificial intelligence in digital finance (pp. 215–232). Springer. https://doi.org/10.1007/978-3-030-94590-9_12

Moody's Analytics. (2024). Open Banking: Real-time analytics for small- and medium-sized enterprises. Moody's Analytics Research.

Rahman, M., et al. (2025). Integration of artificial intelligence in bank customer relationship management in Bangladesh [Preprint]. ResearchGate.

Shokunbi, T. A. (2025). Alternative data scoring for MSME lending: A blueprint for financial inclusion. International Research Journal of Engineering and Technology, 9(1).

Sun, Y., Liu, L., Xu, Y., Zeng, X., Shi, Y., Hu, H., Jiang, J., & Abraham, A. (2024). Alternative data in finance and business: Emerging applications and theory analysis. Financial Innovation, 10, 127. https://doi.org/10.1186/s40854-024-00652-0

Tigges, M., Mestwerdt, S., Tschirner, S., & Mauer, R. (2024). Who gets the money? A qualitative analysis of fintech lending and credit scoring through the adoption of AI and alternative data. Technological Forecasting and Social Change, 205, 123491. https://doi.org/10.1016/j.techfore.2024.123491

World Bank. (2025, December). Improved access to finance to help 7,000 businesses in Uzbekistan grow and create jobs [Press release]. https://www.worldbank.org/

World Bank. (2025/2026). Access to Finance for Jobs and Growth Project (FINGROW) documentation and Enterprise Survey findings.

Zhang, Z. (2025). The transformative role of artificial intelligence and big data in banking [Working paper]. Central University of Finance and Economics / FDIC Center for Financial Research.

THE MECHANISM OF TRANSFORMING THE CULTURAL VALUE OF NATIONAL FASHION ELEMENTS INTO VALUE ADDED IN UZBEKISTAN'S TOURISM PRODUCTS

M. F. Yusupova

Tashkent State University of Economics, Uzbekistan

mohiwka_93@mail.ru

Abstract. *This paper proposes a conceptual mechanism linking the cultural value of national fashion elements to value added in Uzbekistan's tourism products. A literature-based analysis examines authentic interpretation, tourist experience and perceived value as potential antecedents of purchase intention and willingness to pay a premium. The Karakalpak haykel serves as an illustrative example. No primary tourist data were collected. The proposed relationships require empirical validation, and willingness to pay is distinguished from realised economic outcomes.*

Keywords: *national fashion, cultural value, authenticity, tourist experience, perceived value, willingness to pay a premium, value added, haykel.*

INTRODUCTION

Traditional textiles, dress and jewellery can support Uzbekistan's tourism offerings. Here, national fashion elements encompass objects and design features associated with traditional dress and adornment, including contemporary reinterpretations.

Cultural significance does not automatically generate tourist demand. Without explanations of origins, techniques and functions, engagement may remain primarily visual. The research question is how cultural meaning becomes accessible to tourists and supports economic value creation.

The aim is to propose this transformation mechanism by integrating the experience economy (Pine & Gilmore, 1998) and consumer-based authenticity (Kolar & Zabkar, 2010) within Uzbekistan's national fashion context.

METHODS

This conceptual study synthesises literature on authenticity, tourist experience, perceived value and consumer behaviour. Ethnographic publications underpin the illustrative analysis of the Karakalpak haykel.

No primary tourist data were collected. Relationships, price premiums and value added were not empirically assessed. The haykel illustrates cultural characteristics rather than demonstrating the proposed economic effects.

RESULTS

The theoretical synthesis produces the following conceptual sequence:

Cultural value → authentic interpretation → tourist experience → perceived value → purchase intention / willingness to pay a premium → value added.

Cultural value encompasses history, craft knowledge and community significance. Authentic interpretation explains these characteristics accurately and accessibly, distinguishing documented facts, scholarly interpretations and contemporary design decisions.

Documented provenance differs from perceived authenticity. Kolar and Zabkar (2010) distinguish object-based and existential authenticity. Encounters with objects, makers and craft activities may support tourists' cultural engagement within the proposed mechanism.

Huang et al. (2025) examine cultural content and souvenir purchase intention, including mediation through perceived social and heritage value. Their findings inform this framework but do not validate it for Uzbekistan.

Perceived value represents benefits relative to monetary and non-monetary costs. Purchase intention concerns a prospective decision to buy; willingness to pay a premium concerns accepting a higher price than for a comparable alternative. These outcomes require separate assessment.

The transition to value added requires actual purchases. Price premiums and additional revenue are not equivalent to value added; assessing

its increase requires comparing realised output value and the intermediate consumption used to produce it.

The Karakalpak Haykel as an Illustrative Example

The haykel is a women's pectoral ornament incorporating an amulet case. Kudaibergenova (2023, p. 238) describes its place in bridal adornment, its compartment for Quranic excerpts or incantations, and its chains, pendants, bells and carnelian or imitation-carnelian inserts. The publication also identifies variations in the ornament.

Gyul and Hejzlarová (2022, pp. 31, 40–41) analyse Karakalpak haykels and discuss the symbolism of particular museum specimens. Protective meanings and associations between certain motifs and fertility should be understood as cultural beliefs and scholarly interpretations. They should not be attributed automatically to every specimen.



Figure 1. Karakalpak haykel: A women's pectoral ornament incorporating an amulet case.

Note. Photograph by Embergenov (2019), Wikimedia Commons. Licensed under CC BY-SA 4.0.

A proposed tourism scenario combines explanations of the haykel's functions, museum interpretation and jewellery-making demonstrations, followed by contemporary design interpretations. This could make cultural

meanings more accessible and relevant. Effects on demand were not measured.

DISCUSSION

Implementation would involve museums, researchers, craftspeople, designers and tourism organisations. A proposed Karakalpakstan itinerary could combine a museum visit, workshop and purchase opportunities. This is an authorial proposal, not an existing itinerary.

Historical objects, reconstructions and contemporary interpretations must be distinguished. Interactive activities can use purpose-made replicas. Product information should disclose provenance and adaptations.

Guided visits, workshops and product sales offer potential revenue. Commercial performance also depends on quality, price, accessibility and production costs; cultural content complements these factors.

The following hypothesis is proposed for subsequent testing: accurate cultural interpretation and tourists' personal participation may support perceived authenticity and perceived value, which are associated with purchase intention and willingness to pay a premium.

Future research could compare interpretations of the same product with comparable physical characteristics and prices, measuring intentions, acceptable premiums and actual purchases separately. The absence of primary data and reliance on one example limit this study.

CONCLUSION

The mechanism links national fashion's cultural content to perceived tourist value and conditions for economic value creation. The haykel illustrates how artistic, historical and symbolic characteristics can underpin meaningful experiences.

Value added requires realised demand and consideration of intermediate consumption. The proposed relationships remain theoretical

propositions for testing among domestic and international tourists, not established economic effects.

REFERENCES

Embergenov. (2019). *Khaykel: Zhenskoe nagrudnoe ukrashenie* [Haykel: Women's pectoral ornament] [Photograph]. Wikimedia Commons. https://commons.wikimedia.org/wiki/File:Хайкел_Женское_нагрудное_украшение.jpg

Gyul, E., & Hejzlarová, T. (2022). Amulet as jewel, jewel as amulet: Uzbek, Tajik, and Karakalpak amulet cases using the example of museum collections. *Annals of the Náprstek Museum, 43*(1), 27–51. https://doi.org/10.37520/anpm.2022.003

Huang, Q., Yang, D., Xie, Y., Tan, F., & Kuang, T. (2025). How traditional cultural load affects tourists' purchasing intention of tourist souvenirs. *PLOS ONE, 20*(1), Article e0313905. https://doi.org/10.1371/journal.pone.0313905

Kolar, T., & Zabkar, V. (2010). A consumer-based model of authenticity: An oxymoron or the foundation of cultural heritage marketing? *Tourism Management, 31*(5), 652–664. https://doi.org/10.1016/j.tourman.2009.07.010

Kudaibergenova, D. A. (2023). Yuvelirnaya kollektsiya Gosudarstvennogo muzeya iskusstv Respubliki Karakalpakstan imeni I. V. Savitskogo [Jewelry collection of I. V. Savitsky State Museum of Arts of the Republic of Karakalpakstan]. *Istoricheskaya etnologiya, 8*(2), 234–244. https://doi.org/10.22378/he.2023-8-2.234-244

Pine, B. J., II, & Gilmore, J. H. (1998). Welcome to the experience economy. *Harvard Business Review, 76*(4), 97–105. https://hbr.org/1998/07/welcome-to-the-experience-economy

UZBEKISTAN–INDIA POLITICAL AND STRATEGIC PARTNERSHIP: CURRENT STATE, CHALLENGES AND PROSPECTS FOR DEVELOPMENT

Bozorov Otabek Erkin ogli

4 th-year student, Departament of international Relations, University of World Economy and Diplomacy, Tashkent, Uzbekistan

Otabekbozorov492@gmail.com

Abstract.*This article examines the contemporary political and strategic partnership between the Republic of Uzbekistan and the Republic of India. The study focuses on high-level political dialogue, foreign-ministry consultations, interparliamentary diplomacy, regional and international cooperation, transport connectivity, economic diplomacy, educational and cultural exchanges, and emerging areas of strategic interaction. Particular attention is given to the transformation of bilateral relations into a comprehensive strategic partnership following the August 2026 high-level talks. Using official Uzbek sources and the numerical indicators contained in the previously supplied economic study, the article develops a political-institutional assessment of the partnership and identifies practical mechanisms for strengthening its long-term sustainability.*

The study argues that the political value of Uzbekistan–India relations increasingly depends on the ability of both states to convert high-level political agreements into stable institutional mechanisms, measurable roadmaps, parliamentary and expert dialogue, regional connectivity projects, and people-to-people cooperation. The article proposes a framework of political indicators for monitoring the implementation of strategic agreements and strengthening Uzbekistan's role as a bridge between Central and South Asia.

Keywords: *Uzbekistan; India; political relations; strategic partnership; comprehensive strategic partnership; diplomacy; interparliamentary cooperation; Central Asia; South Asia; geopolitical connectivity; foreign policy; regional security; economic diplomacy; public diplomacy.*

1. INTRODUCTION

The transformation of the international system has increased the importance of flexible, diversified and mutually beneficial partnerships. For Uzbekistan, relations with India have a particular political significance because they connect the Central Asian regional agenda with one of the major political, economic and technological centers of South Asia. For India, Uzbekistan is an important partner in Central Asia, particularly in the context of regional connectivity, economic cooperation, education, security and multilateral diplomacy.

The political relationship entered a qualitatively new stage in August 2026. During the high-level talks in Tashkent, President Shavkat Mirziyoyev and Prime Minister Narendra Modi agreed to elevate relations to a comprehensive strategic partnership. The official outcomes also emphasized intensified political contacts at all levels, including parliamentary friendship groups, the Intergovernmental Commission and the Business Council, and the establishment of a coordination mechanism at foreign-minister level. □cite□turn0search3□

The importance of parliamentary diplomacy had already been highlighted in April 2025, when the Uzbek President met the Speaker of India's Lok Sabha and stressed the need for closer interparliamentary exchanges, contacts between relevant committees, friendship groups and youth platforms. □cite□turn0search1□

The August 2026 package of bilateral documents further broadened the institutional basis of cooperation, covering cultural exchanges, higher education and research, environmental protection, economic and financial dialogue, tourism, geology and mineral resources, archives, and cooperation between the University of World Economy and Diplomacy and India's Sushma Swaraj Institute of Foreign Service. □cite□turn0search10□

2. RESEARCH PROBLEM

Despite the rapid expansion of bilateral contacts, an important political-science problem remains: how can high-level political agreements be transformed into durable institutions and measurable outcomes? Strategic partnership becomes sustainable only when political dialogue is supported by institutional continuity, interparliamentary mechanisms, expert networks, regional cooperation, economic interdependence and public diplomacy.

Accordingly, the research problem is defined as the identification of institutional and geopolitical mechanisms capable of converting Uzbekistan–India political convergence into a stable, multidimensional and long-term partnership.

3. RESEARCH AIM AND OBJECTIVES

The main aim is to assess the current political and strategic partnership between Uzbekistan and India and to substantiate priority mechanisms for its further development.

The objectives are: (1) to analyze the evolution of political dialogue; (2) to examine institutional mechanisms of strategic partnership; (3) to assess interparliamentary diplomacy; (4) to identify the regional and international dimensions of cooperation; (5) to evaluate the political significance of connectivity, economic and educational cooperation; (6) to identify key challenges; and (7) to propose measurable policy recommendations.

4. RESEARCH METHODOLOGY

The study applies systematic political analysis, comparative analysis, institutional analysis, historical-logical analysis, content analysis of official statements and policy documents, and secondary statistical interpretation. The principal political evidence is drawn from official publications of the President of Uzbekistan and Uzbek diplomatic institutions. Economic figures are used only as supporting indicators of the material foundation of political partnership and are taken from the supplied source article.

The methodology deliberately distinguishes official facts from analytical interpretation. No unsupported annual trend series is constructed where the source material does not provide a complete statistical dataset.

5. EVOLUTION OF UZBEKISTAN–INDIA POLITICAL DIALOGUE

The political relationship demonstrates a gradual movement from traditional bilateral diplomacy toward a broader strategic partnership. Regular high-level contacts have been accompanied by institutional dialogue among ministries, parliaments, regions, universities and business communities.

In August 2025, the leaders discussed the further deepening of strategic partnership, regional issues, transport routes within the North–South corridor, and the intensification of regional and cultural exchanges. The official account also recorded a prospective project portfolio of USD 2 billion and the operation of four Indian university branches in Uzbekistan. □cite□turn0search11□

The August 2026 state visit represented a decisive institutional step. The leaders described the relationship as a comprehensive strategic partnership and agreed to intensify political contacts and exchanges at all levels. They also emphasized continued mutual support within the UN, SCO, BRICS and other multilateral frameworks. □cite□turn0search3□turn0search6□

Table 1.

Main institutional dimensions of the Uzbekistan–India political partnership

Dimension	Current mechanism / evidence	Political significance
High-level diplomacy	Presidential and prime-ministerial dialogue	Strategic trust and political coordination

Foreign-ministry dialogue	Regular diplomatic consultations	Continuity of foreign-policy communication
Interparliamentary diplomacy	Parliamentary friendship groups and committee contacts	Broader institutional legitimacy
Multilateral diplomacy	UN, SCO, BRICS and other formats	Mutual support on international issues
Regional cooperation	Central Asia–South Asia connectivity agenda	Geopolitical and economic linkage
Regional diplomacy	Partnerships between Uzbek regions and Indian states	Subnational diplomacy
Education diplomacy	Four Indian university branches in Uzbekistan	Long-term human-capital links
Public diplomacy	Cultural centres, cultural days and exchanges	People-to-people trust

6. INTERPARLIAMENTARY DIPLOMACY AS A POLITICAL INSTRUMENT

Interparliamentary diplomacy can strengthen strategic partnership by creating a wider institutional base for foreign-policy relations. In April 2025, the Uzbek side emphasized parliamentary exchanges, contacts between specialized committees, friendship groups and youth platforms. □cite□turn0search1□

From a political-science perspective, parliamentary diplomacy performs three functions. First, it creates continuity beyond executive-level contacts. Second, it enables specialized political dialogue on legislation and sectoral cooperation. Third, it contributes to public legitimacy by connecting foreign-policy priorities with representatives of society.

A practical next step would be to establish an annual Uzbekistan–India Parliamentary Forum with working groups on regional connectivity, digital policy, education, environmental cooperation and youth engagement.

7. REGIONAL AND GEOPOLITICAL DIMENSION

Uzbekistan–India relations have significance beyond the bilateral level. Uzbekistan seeks to strengthen its role as a Central Asian connectivity hub, while India seeks greater economic and strategic engagement with Central Asia. The North–South transport agenda therefore has a political as well as economic dimension.

The partnership can contribute to a broader Central Asia–South Asia dialogue by connecting transport, trade, energy, education and security agendas. However, such connectivity requires sustained diplomatic coordination because infrastructure projects depend on multiple states, transit regimes, customs procedures and geopolitical conditions.

The political objective should therefore be not merely to support individual transport projects but to create predictable diplomatic mechanisms for discussing connectivity, transit and regional economic security.

Table 2.

Political significance of priority cooperation areas

Area	Strategic function	Potential political outcome
Transport connectivity	Connect Central and South Asia	Greater regional interdependence
Digital cooperation	Technology and digital governance	Modern strategic partnership
Energy	Long-term infrastructure cooperation	Energy-security dialogue
Critical minerals	Resource and industrial diplomacy	Strategic supply-chain cooperation
Healthcare/pharmaceuticals	Human security and technology	Socially visible partnership
Education and research	Knowledge diplomacy	Long-term elite and expert networks

Culture and tourism	Public diplomacy	Mutual societal understanding
Environmental cooperation	Transboundary/global challenges	Sustainable diplomatic agenda

8. ECONOMIC DIPLOMACY AS A SUPPORTING ELEMENT OF POLITICAL PARTNERSHIP

The economic relationship provides an important material foundation for political cooperation. The supplied source article reports 2025 bilateral trade of approximately USD 1.3 billion, exports of USD 164.8 million, imports of USD 1.1 billion, more than USD 587 million in Indian investment during 2016–2025, 439 enterprises with Indian capital, a USD 2 billion prospective project portfolio and 14 direct flights per week.

These indicators should not be treated as political indicators by themselves. Their political relevance lies in the degree to which economic interdependence creates durable constituencies for bilateral cooperation. The 2026 high-level talks set a target of increasing bilateral trade to USD 5 billion by 2030 and identified energy, critical minerals, healthcare, pharmaceuticals, electronics, mechanical engineering, agriculture and other areas for expanded cooperation. □cite□turn0search6□

Table 3.

Selected supporting indicators of bilateral partnership

Indicator	Value reported in source material	Political interpretation
Bilateral trade, 2025	USD 1.3 billion	Material basis of economic diplomacy
Indian investment, 2016–2025	More than USD 587 million	Investment interdependence
Enterprises with Indian capital	439	Private-sector network

Prospective project portfolio	USD 2 billion	Future cooperation capacity
Direct flights	14 per week	Human and business connectivity
2030 trade target	USD 5 billion	Long-term economic-diplomacy objective

9. CULTURAL, EDUCATIONAL AND PUBLIC DIPLOMACY

Public diplomacy is becoming an increasingly important component of strategic partnership. The official 2026 outcomes emphasized cultural exchanges, education, research and regular Days of Culture, concerts, exhibitions, forums and film festivals. A five-year Cultural Exchange Program for 2026–2030 was also included in the signed package. □cite□turn0search3□turn0search10□

The presence of four Indian university branches in Uzbekistan provides an especially important platform for knowledge diplomacy. Cooperation between the University of World Economy and Diplomacy and the Sushma Swaraj Institute of Foreign Service can contribute to professional diplomatic education and the formation of expert networks. □cite□turn0search10□

10. KEY POLITICAL CHALLENGES

• Transforming high-level political agreements into stable, measurable and continuously monitored implementation mechanisms.

• Ensuring institutional continuity between changes in political priorities and the implementation of long-term agreements.

• Expanding parliamentary and expert diplomacy beyond ceremonial exchanges.

• Turning regional connectivity initiatives into practical, coordinated and politically sustainable projects.

• Developing deeper cooperation in emerging areas such as digital governance, artificial intelligence and cyber policy.

• Balancing economic diplomacy with wider foreign-policy and regional-security priorities.

• Expanding public diplomacy so that strategic partnership becomes visible at the societal level.

11. PROPOSED POLITICAL POLICY FRAMEWORK

Proposed mechanism	Implementation	Expected result
Annual Strategic Dialogue	Foreign-minister level + expert participation	Continuity and policy coordination
Uzbekistan–India Parliamentary Forum	Annual meeting + sectoral working groups	Institutionalized parliamentary diplomacy
Connectivity Dialogue	Transport, customs and diplomatic agencies	Faster regional connectivity
Strategic Partnership Monitoring Dashboard	Annual indicators and responsible institutions	Measurable implementation
Diplomatic education program	UWED–Sushma Swaraj Institute cooperation	Professional expert networks
Youth and academic platform	Universities and research centres	Track-two diplomacy
Regional partnership network	Uzbek regions–Indian states	Subnational diplomacy
Public diplomacy calendar	Culture, cinema, education and tourism	People-to-people trust

12. SCIENTIFIC NOVELTY

The scientific novelty of the study is expressed in a comprehensive political-institutional interpretation of Uzbekistan–India relations. Unlike an approach focused mainly on trade and investment, this article conceptualizes the partnership as an interconnected system of high-level diplomacy, interparliamentary relations, multilateral coordination, regional connectivity, economic diplomacy, education, culture and public diplomacy.

A second contribution is the proposed monitoring framework, which links political agreements to measurable institutional mechanisms such as

annual strategic dialogue, parliamentary forums, implementation roadmaps, expert networks and sector-specific indicators.

13. PRACTICAL SIGNIFICANCE

The recommendations can be used by public institutions, diplomatic structures, parliamentary committees, research centres and universities when preparing analytical materials and cooperation programs with India. The proposed framework may also serve as a basis for evaluating the implementation of the comprehensive strategic partnership through annual political and institutional indicators.

14. CONCLUSION

Uzbekistan–India relations have entered a new political stage. The August 2026 decision to elevate bilateral relations to a comprehensive strategic partnership represents an important institutional milestone. The partnership is supported by high-level political dialogue, interparliamentary cooperation, multilateral coordination, transport connectivity, economic interaction, education and cultural diplomacy. □cite□turn0search3□turn0search10□

The central challenge is now implementation. A strategic partnership becomes durable when political agreements are translated into institutional routines, responsible agencies, measurable targets, expert networks and regular monitoring. Therefore, the next stage should focus on building a permanent architecture of strategic dialogue rather than relying exclusively on high-level meetings.

For Uzbekistan, cooperation with India can strengthen its position as a bridge between Central and South Asia. For India, deeper relations with Uzbekistan can provide a reliable platform for engagement with Central Asia. The convergence of these interests creates a substantial foundation for long-term political cooperation, provided that connectivity, parliamentary

diplomacy, public diplomacy, education and economic cooperation are coordinated within a common strategic framework.

REFERENCES

1. President of the Republic of Uzbekistan. President of Uzbekistan speaks in favor of active inter-parliamentary cooperation with India. 7 April 2025. Official website of the President of Uzbekistan.

2. President of the Republic of Uzbekistan. Leaders of Uzbekistan and India discuss issues of further deepening relations of strategic partnership. 12 August 2025. Official website of the President of Uzbekistan.

3. President of the Republic of Uzbekistan. Prime Minister of India to pay a state visit to Uzbekistan. 28 August 2026. Official website of the President of Uzbekistan.

4. President of the Republic of Uzbekistan. President of Uzbekistan and Prime Minister of India agree to take relations to a new level. 30 August 2026. Official website of the President of Uzbekistan.

5. President of the Republic of Uzbekistan. Leaders of Uzbekistan and India outline outcomes of talks. 30 August 2026. Official website of the President of Uzbekistan.

6. President of the Republic of Uzbekistan. Substantial package of documents adopted to strengthen Uzbek-Indian partnership. 30 August 2026. Official website of the President of Uzbekistan.

7. Ministry of Foreign Affairs of the Republic of Uzbekistan. Official diplomatic materials concerning Uzbekistan–India relations, 2026.

8. Supplied source article: “The Current State, Problems and Development Prospects of Uzbekistan–India Trade and Economic Cooperation.”

THE COMPLEMENTARITY OF RESTRICTED COMBINABILITY AND LEXICAL FUNCTION THEORY IN THE DESCRIPTION OF COLLOCATIONAL RELATIONS

Xaydar Azamatovich Xamdamov

PhD in Philology, Acting Associate Professor, Department of Philology

University of Information Technology and Management (UITM)

Abstract. *The article compares the Uzbek concept of restricted combinability with the lexical-function apparatus of Meaning-Text Theory. The material comprises 12 functionally parallel Uzbek-English rows, or 24 diagnostic units. Each unit was coded for base-to-collocate selection, semantic operator, actant structure, and morphosyntactic realization. The analysis shows that restricted combinability localizes a language-specific lexical constraint around a particular base, whereas a lexical function generalizes the recurrent semantic task performed by the collocate. Evidence from Magn, Oper₁, Real, Bon, IncepOper₁, and IncepFunc₀ demonstrates that the two approaches are complementary rather than interchangeable. An integrated description combining base sense, selection direction, lexical function, and structural model is proposed.*

Keywords: *restricted combinability, collocation, lexical function, base, collocate, Magn, Oper₁, Real, lexical selection.*

INTRODUCTION

Two questions invariably arise together when collocational relations are explained. First, why does a speaker select a particular lexical partner to express a given concept? Second, what semantic function does the selected partner add to the meaning of the base? For example, katta qiziqish and keen interest both express a high degree, but this shared meaning is realized by different collocates in the two languages. Likewise, in fikr bildirmoq and express an opinion, the meaning of the noun is retained, while the verb brings that meaning into the predicative center of the sentence. Such cases cannot

be fully explained solely through syntactic dependency or the dictionary meanings of their components.

J. R. Firth associated word meaning with its habitual environment [1], while J. Sinclair developed the collocational approach by explaining recurrent patterns of lexical selection in texts [2]. In Uzbek linguistics, research into the factors governing word combination, valency, and restricted combinability has helped distinguish syntactic potential from lexical selection [8-11]. Within the restricted-combinability approach, the focus is on which particular partners a lexeme selects within a general grammatical model and on the fact that this selection cannot be freely transferred to other bases.

I. Mel'čuk's theory of lexical functions formalizes collocational relations from a different perspective. A lexical function assigns to a particular base lexeme a lexical value, or a set of values, that expresses a standard semantic relation [3; 4]. Magn, for example, denotes 'high degree'; $Oper_1$ verbalizes the action or state named by the base with the participation of its first actant; and Real denotes the fulfillment of a function, requirement, or purpose associated with the base. Bon expresses positive evaluation, whereas $IncepOper_1$ and $IncepFunc_0$ generalize different actant-syntactic realizations of inchoative meaning. Importantly, the general function may remain stable in cross-linguistic comparison, while its concrete lexical value depends on the language and on the sense of the base [3; 6].

Although restricted combinability and lexical functions illuminate different aspects of the same phenomenon, they are often applied separately in descriptions of Uzbek-English collocations. Consequently, the lexical constraint identified by the first approach is not systematically connected to the semantic code supplied by the second. This article aims to identify the areas of convergence and divergence between the two theoretical frameworks and to integrate them into a single descriptive sequence. Three questions are

examined: in which component the restriction is located; which standard function the collocate performs; and to what extent the direction of selection corresponds to surface syntactic order.

METHODS

The material consists of 12 functionally parallel pairs selected from an experimental bilingual collocational register compiled as part of the dissertation research and from theoretical sources. Each pair contains one Uzbek and one English diagnostic unit, yielding a total of 24 units. The sample was distributed across six functional types: three pairs for Magn, three for $Oper_1$, three for Real, one for Bon, and one each for $IncepOper_1$ and $IncepFunc_0$. The material was treated not as a quantitatively representative corpus but as a purposive sample designed to test the operation of the two theoretical descriptions against contrasting examples. Accordingly, no percentage-based conclusions were drawn about the frequency or overall distribution of the units in the two languages.

The unit of analysis was defined not as an isolated word, but as a directed base → collocate relation associated with a particular sense. In the coding scheme, B denotes the base, selected relatively freely in conceptual terms; C denotes the collocate, whose selection is lexically constrained relative to that base; F denotes the lexical function performed by the collocate; and M denotes the morphosyntactic model of the combination. In the relation qiziqish → katta, for example, the noun is the base and the collocate is a value of Magn expressing high degree. On the surface, however, the collocate precedes the base. Thus, the direction of conceptual selection was not equated with the linear order of words.

Descriptive, componential, distributional, and contrastive methods were used in combination. Four procedures were applied to each unit. First, the sense of the base and its referential independence were established. Second, the possibility of replacing the collocate with a near-synonymous

unit in the same function was tested. Third, the resulting semantic relation was encoded by the relevant lexical function. Finally, the structural models of the Uzbek and English values were compared. In distinguishing $Oper_1$ from Real, actant structure and the function of the verb were considered. $Oper_1$ converts the situation named by the base into a syntactic predicate, whereas Real denotes the fulfillment of the purpose, norm, or instruction expressed by the base [3; 5]. Because Real indices depend on actant analysis, the general code Real was used in the pilot table.

The diagnostic pairs were presented not as established translation equivalents, but as possible realizations of the same functional code in the two languages. This restriction prevents a translation relationship from being asserted without evidence from parallel texts. The study does not attempt to cover the complete inventory of lexical functions; it includes six functions sufficient to demonstrate their relationship with restricted combinability.

RESULTS

Across all groups, the analysis showed that the meaning of the base remains relatively independent, whereas the collocate emerges through constrained selection in the expression of a particular semantic function. Restricted combinability identifies the existence of the constraint, while the lexical function distinguishes its type. Table 1 summarizes the diagnostic material.

Table 1.

Diagnostic correspondence between restricted combinability and lexical functions

Function	Semantic function	Uzbek values	English values
Magn	high degree	kuchli bosim; qizg‘in munozara; katta qiziqish	intense pressure; heated debate; keen interest

$Oper_1$	predicativization of a situation	fikr bildirmoq; tekshiruv o‘tkazmoq; qarshilik ko‘rsatmoq	express an opinion; conduct a review; offer resistance
Real	fulfillment of a goal or requirement	maqsadga erishmoq; talabga javob bermoq; maslahatga amal qilmoq	achieve a goal; meet a requirement; follow advice
Bon	positive evaluation of the base	qimmatli hissa	valuable contribution
$IncepOper_1$ / $IncepFunc_0$	external initiation / onset of an event	muhokamani boshlamoq; savol tug‘ilmoq	initiate a discussion; a question arises

The Magn rows reveal the zone in which the two theories intersect most directly. With bosim, munozara, and qiziqish as bases, 'high degree' remains the shared semantic operator, but the value that expresses it varies according to the base and the language. Uzbek kuchli, qizg‘in, and katta, together with English intense, heated, and keen, are not mechanical variants of a single general intensifier such as very. Restricted combinability records locally which adjective is conventional with which noun, whereas Magn groups these different adjectives into a single functional class. Constraint and generalization are therefore not contradictory; they operate at two different levels of description.

In the $Oper_1$ group, correspondence was syntactic as well as semantic. In fikr bildirmoq, tekshiruv o‘tkazmoq, and qarshilik ko‘rsatmoq, the independent lexical content of the verb is weakened, and the verb integrates the nominal base into a predicative structure. English express, conduct, and offer perform the same function, but they cannot be replaced by a universal verb equivalent to qilmoq/do. Restricted combinability shows that fikr selects bildirmoq and review selects conduct. $Oper_1$, in turn, identifies the common predicativizing relation represented by the different verbs. Here the B → C

direction is not equivalent to the surface head-dependent relation. Although the verb is the grammatical head, lexical selection is conditioned by the nominal base.

The Real results show that external formal similarity to $Oper_1$ does not imply identity of internal function. In maqsadga erishmoq, talabga javob bermoq, and maslahatga amal qilmoq, the verb does not merely predicativize the base. Rather, it denotes the attainment of a goal, the satisfaction of a requirement, or compliance with an instruction. English achieve a goal, meet a requirement, and follow advice express the same functional domain through different verbs and government patterns. Thus, the noun + verb model alone is insufficient for assigning units to the same class. Base semantics, actant role, and resultative function must be examined together.

Bon and the phase functions demonstrate that restricted combinability alone does not name the semantic distinction. In qimmatli hissa - valuable contribution, the collocate evaluates the base as useful and worthy. In muhokamani boshlamoq - initiate a discussion, an external actant initiates the process and the base occurs as an object. In savol tug‘ilmoq - a question arises, the base occupies the subject position as the event that comes into existence. Restricted combinability records the concrete lexical choice in all three cases, while the lexical function distinguishes positive evaluation from the two syntactic-semantic types of inception.

On the basis of the results, an integrative representation of the form $\langle B_s, B \rightarrow C, F, M \rangle$ is proposed. Here B_s denotes the specific sense of the base, $B \rightarrow C$ the direction of lexical selection, F the standard or, where necessary, non-standard lexical function, and M the morphosyntactic model. The descriptive sequence proceeds as follows. First, the sense of the base is identified. Next, the range within which the collocate can be replaced in the same function is examined. The semantic function is then encoded, and finally the structural realization is recorded. This sequence makes it possible

to represent both different functions realized by the same form and different formal values of a single function.

DISCUSSION

The findings show that restricted combinability and lexical functions are not fully synonymous. The central question of restricted combinability is which partner is subject to constrained selection relative to a particular base. The central question of a lexical function is what generalized meaning or syntactic role that partner expresses. The first organizes the concrete lexical norm of a language, whereas the second systematizes recurrent semantic relations across different units. Lexical functions therefore cannot entirely replace an inventory of restricted collocates. Conversely, restricted combinability does not in itself provide the functional distinction among Magn, Oper$_1$, and Real.

A further benefit of integration is that it clarifies the boundary between grammar and lexical selection. Uzbek case marking and analytical verb constructions, and English prepositions and relatively fixed word order, may express the same function through formally different means. Structural difference, however, does not automatically imply functional equivalence, just as functional similarity does not automatically establish a ready-made translation equivalent. For each language, the value of a lexical function must be verified as independent lexical evidence [3; 5; 7]. In this respect, the proposed scheme does not reduce contrastive description to literal equivalence.

The model also does not require every restricted combination to be forced into a standard function. If a culture-specific or narrowly specialized relation does not fit a standard code such as Magn, Oper, or Bon, a non-standard function may be recorded through an explicit definition. Otherwise, a concise formal code may oversimplify the actual semantic properties of the material. Likewise, the degree of collocational restriction is not absolute:

some values are associated with a narrow set of bases, whereas others apply to a broad semantic class. The integrative model should therefore preserve, alongside the code, a brief explanation and the range of possible variants.

The study is limited by the small size of the diagnostic sample and by the selection of units for a specific theoretical purpose. The results do not support claims about the completeness of the inventory of lexical functions or the frequency of the units. Future research should include a wider range of semantic domains, non-standard functions, and independent expert coding, and should separately examine the register- and context-dependence of competing values for the same base.

CONCLUSION

The findings support the following conclusions. Restricted combinability localizes a lexical constraint around a concrete base, while a lexical function generalizes the recurrent semantic task performed by the collocate. The two approaches are therefore complementary. The direction of base → collocate selection is not identical to the surface order of the components or to syntactic headedness. In $Oper_1$ constructions in particular, a verb that is grammatically the head may be lexically conditioned by the nominal base. The same morphosyntactic model may realize different functions, whereas the same function may produce different lexical and grammatical values in Uzbek and English. Description must therefore encompass base sense, restriction, function, and structure together. The proposed $\langle B_s, B \rightarrow C, F, M \rangle$ scheme systematically connects restricted combinability with lexical functions, but it does not remove the need to verify corpus attestation and cross-linguistic equivalence separately for each unit.

REFERENCES

1. Firth, J. R. A Synopsis of Linguistic Theory, 1930-1955. In F. R. Palmer (Ed.), Selected Papers of J. R. Firth, 1952-59. London: Longman, 1968, pp. 168-205.

2. Sinclair, J. Corpus, Concordance, Collocation. Oxford: Oxford University Press, 1991. 179 p.

3. Mel'čuk, I. Collocations and Lexical Functions. In A. P. Cowie (Ed.), Phraseology: Theory, Analysis, and Applications. Oxford: Clarendon Press, 1998, pp. 23-53. https://doi.org/10.1093/oso/9780198294252.003.0002

4. Mel'čuk, I. A. Lexical Functions in Lexicographic Description. Proceedings of the Eighth Annual Meeting of the Berkeley Linguistics Society, 1982, pp. 427-444. https://doi.org/10.3765/bls.v8i0.2038

5. Benson, M., Benson, E., & Ilson, R. The BBI Dictionary of English Word Combinations (Rev. ed.). Amsterdam/Philadelphia: John Benjamins, 1997. 386 p. https://doi.org/10.1075/z.bbi1.2nd

6. Wanner, L. (Ed.). Lexical Functions in Lexicography and Natural Language Processing. Amsterdam/Philadelphia: John Benjamins, 1996.

7. Poulsen, S. Collocations as a Language Resource: A Functional and Cognitive Study in English Phraseology (PhD dissertation). Odense: University of Southern Denmark, 2005.

8. Nazarova, S. A. Factors and Methods of Word Combination. Tashkent: Fan, 2013. 98 p. [in Uzbek].

9. Nazarova, S. A. The Syntax of Word Combinations in a Substantive Interpretation. Tashkent: Fan, 2015. 112 p. [in Uzbek].

10. Mirtojiyev, M., & Muhamedova, S. Word Valencies in the Uzbek Language. Tashkent: TSPU, 2014. 163 p. [in Uzbek].

11. Ibragimov, J. Yo. Restricted Combinability of Independent Lexemes in Uzbek and Its Models (DSc dissertation). Qarshi, 2023. [in Uzbek].

12. Daniyeva, M. J. The Realization of Derivational and Pragmatic-Discursive Potential of Word Combinations: Evidence from English and Uzbek (DSc dissertation). Bukhara, 2022. 263 p. [in Uzbek].

13. Heid, U. On Ways Words Work Together: Topics in Lexical Combinatorics. Proceedings of the VIth EURALEX International Congress. Amsterdam, 1994, pp. 226-257.

"FORMATION AND DEVELOPMENT OF ISLAMIC BANKING IN UZBEKISTAN BASED ON FOREIGN EXPERIENCE (KAZAKHSTAN)"

Shakhnoza Bozorova

The university of world economy and diplomacy

Master's degree student

shaxnoza0102@icloud.com

Abstract: *This article examines Kazakhstan's experience in establishing and developing Islamic banking and analyzes the possibilities of applying this experience in Uzbekistan. The study considers the Islamic banks operating in Kazakhstan, their financing products, and their activities based on Islamic finance principles. It also analyzes the mechanism of introducing "Islamic windows" in conventional banks, the separate accounting of Islamic finance operations, and qualification requirements for bank managers and employees. Based on the analysis, the article proposes establishing "Islamic windows" in conventional banks alongside Islamic banks, developing sukuk and Islamic equity markets, and improving the legal and tax frameworks in Uzbekistan.*

Keywords: *Islamic banking, Islamic finance, Kazakhstan's experience, Islamic banks, Islamic window, sukuk, Sharia principles.*

INTRADUCTION

Islamic finance is a steadily growing trend worldwide, including: Islamic banking, Islamic securities (sukuk), Islamic insurance (takaful), Islamic funds and other Islamic financial institutions. Islamic banking is the most leading and developed segment of Islamic finance, accounting for almost 69% of the total assets of Islamic finance.[7]

In Uzbekistan, the Law of the Republic of Uzbekistan "On Amendments and Amendments to Certain Legislative Acts of the Republic of Uzbekistan on the Introduction of Islamic Banking Activities in

[7] "Islamic finance market overview", 2025. https://www.marketreportsworld.com/market-reports/islamic-finance-market-14721978

Uzbekistan" (URQ-1126),[8] adopted on March 27, 2026, on the organization of Islamic finance, in particular, Islamic banking, serves as a legal basis for accelerating these processes. Studying foreign experience and adapting it to our country will also help to achieve positive practical results. In this regard, one of the countries that can be taken as an example is Kazakhstan. The existing Islamic banks in this country are studied and analyzed in depth, and proposals are made for the organization and development of Islamic banking in our country.

Islamic banking in Kazakhstan operates in accordance with the principles of Sharia: without usury, without financing prohibited activities, without speculation (gharar) and gambling (maysir), as well as with full risk and profit sharing between the bank and the client. Today, three Islamic banks operate in Kazakhstan: two under national jurisdiction and one at the Astana International Financial Center (AIFC).[9]

ADCB Islamic Bank JSC – ADCB Islamic Bank, established in 2010, is the first Islamic bank in Kazakhstan and the Commonwealth of Independent States (CIS). ADCB Islamic Bank provides corporate and institutional clients with a full range of Sharia-compliant banking services, including various financing structures and cash management solutions.[10]

In 2024, Al Hilal Islamic Bank JSC was rebranded as ADCB Islamic Bank JSC to strengthen its focus on corporate banking services in Kazakhstan and support clients operating in key economic corridors through the ADCB Group's strategic presence in Kazakhstan, the United Arab Emirates, Egypt and Saudi Arabia. ADCB Islamic Bank's head office is located in Almaty, with a branch in Astana.

[8] "Law of the Republic of Uzbekistan "On Amendments and Additions to Certain Legislative Acts of the Republic of Uzbekistan Aimed at Introducing Islamic Banking Activities in Uzbekistan"", https://lex.uz/uz/docs/8099403

[9] "How does Islamic banking work in Kazakhstan", https://bank.kz/wikibank/kredity/kak-rabotaet-islamskij-banking-v-kazahstane-obzor-bankov-i-uslug/

[10] "ADCB islamic bank's short review", https://www.adcb.com/ru/kazakhstan/business/about-us/

ADCB Islamic Bank is 100% owned by ADCB. ADCB, listed on the Abu Dhabi Stock Exchange (ADX), itself has a strong shareholder base, with the majority (60.69%) owned by Mubadala Investment Company, a sovereign investor based in Abu Dhabi.

ADCB Islamic Bank JSC – ADCB Islamic Bank, established in 2010, is the first Islamic bank in Kazakhstan and the Commonwealth of Independent States (CIS). ADCB Islamic Bank provides corporate and institutional clients with a full range of Sharia-compliant banking services, including various financing structures and cash management solutions.

In 2024, Al Hilal Islamic Bank JSC was rebranded as ADCB Islamic Bank JSC to strengthen its focus on corporate banking services in Kazakhstan and support clients operating in key economic corridors through the ADCB Group's strategic presence in Kazakhstan, the United Arab Emirates, Egypt and Saudi Arabia. ADCB Islamic Bank's head office is located in Almaty, with a branch in Astana. ADCB Islamic Bank is 100% owned by ADCB. ADCB, listed on the Abu Dhabi Stock Exchange (ADX), itself has a strong shareholder base, with the majority (60.69%) owned by Mubadala Investment Company, a sovereign investor based in Abu Dhabi.

Some of the financing services offered by ADCB Islamic Banking include:

- Corporate Murabaha. You identify the product and the supplier; the bank purchases the item and sells it to you on an installment basis with a markup.
- Commodity Murabaha. The bank purchases a commodity from a broker and sells it to you on an installment basis with a fixed markup. You may then sell the commodity to another broker to receive the full cash amount.
- Ijarah (Leasing). The bank purchases an asset and enters into a lease agreement with the customer.

Additionally, the bank offers Sharia-compliant deposit and investment services. The bank invests in profitable projects and shares the profits between the customer and the bank.

Zamon Bank is the first Islamic digital bank in Kazakhstan, providing online financing, cards and deposits for individuals and businesses.

Stages of development of Zamon Bank:[11]

• 1991 - Established as a private bank "Zamon" in Almaty

• 2013 - A decision was made to transition to the Islamic model

• The Islamic Corporation for the Development of the Private Sector (ICD) was involved as a strategic partner

• 2014 - Zamon Bank, together with the consulting company Al Maali (UAE) and the law firm Zicolaw (Malaysia), developed the procedure and mechanism for transforming into an Islamic bank. This step was an important stage in preparing for the transition to full compliance with the principles of Sharia

• 2016 – Zamon Bank began submitting proposals for legislative amendments to pave the way for the conversion of conventional banks into Islamic banks. On July 13 of that year, the bank received official authorization from the National Bank of the Republic of Kazakhstan to convert into an Islamic bank.

• 2017 – The National Bank issued an Islamic banking license. A council on Islamic finance principles was established with the participation of a Sharia review board. The bank became a member of Bursa Malaysia and expanded its capabilities for developing Murabaha products.

• 2025 – Zamon Bank opened a new chapter in its history by entering the market with products for both individuals and legal entities.

[11] "About Islamic bank – Zaman bank", https://zamanbank.kz/ru/about-bank/pervyj-islamskij-cifrovoj-bank-v-kazahstane

Zamon Bank serves both individuals and businesses. Its main advantage is that financing can be obtained quickly and online. For individuals, it offers financing for various purposes with the following basic conditions:

Up to 3,000,000 tenge

Up to 5 years

No interest, collateral or hidden fees

Current offers include financing for education, events (e.g. weddings), home renovation, travel, and the purchase of a car or equipment.

Financing for businesses is available on the following conditions:

Up to 10,000,000 tenge

Up to 5 years

No interest, collateral or hidden fees

You can get a loan to open a new store, expand your product range, increase working capital and much more.

Al Safi Bank is a modern bank registered at the Astana International Financial Centre (AIFC) in 2022. Its services encompass retail and corporate financing, investments, money transfers, and account management.

Additionally, “Qatar Finagroup Holding” LLC registered Al Amanah Islamic Bank at the AIFC (in 2026).[12] This bank operates as an Islamic bank serving professional clients and market counterparties; it does not provide services to individuals. The new company, wholly owned by a Qatari founder, has an announced capital of $10 million, and Nargiza Khudabaeva has been appointed CEO. Mirlan Taimurzaev, who previously managed the AIFC-registered Al Safi Bank, serves on its board of directors.

The bank plans to provide financing through instruments such as *Qard* (interest-free loan), *Wakala* (an investment account where the bank

[12] “Another Islamic bank is established in Kazakhstan”, https://nationalbusiness.kz/news/eshyo-odin-islamskiy-bank-sozdayut-v-kazahstane-8bccf8/

manages client funds as an agent), *Murabaha* (selling an asset to the client at a pre-agreed markup), and *Tawarruq* (financing through the sequential purchase and sale of commodities), as well as to facilitate cross-border trade settlements and currency transactions. Tayyab is a prominent Islamic finance service (established in 2022) that offers Halal financing—including for vehicles—and Sukuk products compliant with Sharia principles.

Vehicle financing terms are as follows:

Down payment: Starting from 20%

Financing term: Up to 7 years

Maximum financing amount: 20,000,000 tenge

Maximum vehicle value: 60,000,000 tenge

To apply for the service, you need to fill out an application on the website, undergo approval, select a vehicle, and finalize the transaction. A special calculator is also available for making preliminary calculations.

Refinancing: If you currently hold loans involving *riba* (interest), the company offers an opportunity to pay them off:

Maximum refinancing amount: 8,000,000 tenge

Refinancing term: Up to 7 years

Unsecured consumer loans, loans for goods, and credit card debts are eligible for refinancing.

Mizan Finance is a company established in 2025 that provides Sharia-compliant financing for small and medium-sized enterprises (SMEs). It offers financing based on *Musharaka* and *Murabaha* principles.

This year, traditional banks in Kazakhstan gained the opportunity to provide Islamic banking services through "Islamic windows." The Law "On Banks and Banking Activity"[13] enabled banks to engage in Islamic financing without altering their core business operations. This approach opens up new

[13] “About banks and banking activities in the Republic of Kazakhstan”, О банках и банковской деятельности в Республике Казахстан - ИПС "Әділет"

opportunities for investors—including foreign ones—and simplifies entry into the Islamic banking market. It also helps improve access to Islamic banking services for both individuals and businesses.

After studying international best practices and consulting with central banks and regulators from other countries, the Agency adopted a liberal regulatory model for "Islamic windows." This model is well-suited for traditional banks; it facilitates closer interaction between the "Islamic window" and the bank's conventional operations while ensuring the autonomy of the bank's internal Sharia boards.[14]

The main requirement for "Islamic windows" is to separate their activities from the main activities of the bank. All operations related to Islamic banking will be accounted for separately. It will also be necessary to introduce minimum qualification requirements based on the principles of Islamic finance for bank managers and board members.

After studying the Islamic banks and microfinance organizations operating in Kazakhstan, the following conclusions and proposals can be made:

1. Despite the fact that the organization and development of Islamic finance in this country began in 2009,[15] this direction has not been fully formed in the country. The reason for this is the lack of inclusion in the formation of Islamic finance - it is limited only to Islamic banks. From this point of view, the organization and development of Islamic finance in Uzbekistan should not be limited only to Islamic banks, but also by organizing "Islamic windows" in traditional banks, issuing Islamic bonds (sukuk), and organizing an Islamic stock market, thereby accelerating and scaling up these processes.

[14] "Traditional banks offer Islamic banking services on the format "Islamic window"", https://www.gov.kz/memleket/entities/ardfm/press/news/details/975574?lang=ru
[15] "Islamic finance in Kazakhstan", https://aifb.kz/tpost/9ov9ca2fs1-islamskie-finansi-v-kazahstane

2. It would be more effective to study and analyze foreign experience in organizing and forming Islamic banks in our country, and to implement them in practice, adapting them to our existing system.

3. It would also be appropriate to revise the legislation and tax system in implementing these processes, making the necessary changes and additions.

4. And most importantly, it is also necessary to train and improve the skills of sufficient personnel in Islamic finance. To achieve this, it would be appropriate to study the experience of foreign specialists, and, if necessary, to introduce weekly and monthly internships in highly reputable Islamic banks abroad.

LITERATURE, REFERENCES

1. “Islamic finance market overview”, 2025. https://www.marketreportsworld.com/market-reports/islamic-finance-market-14721978

2. “Law of the Republic of Uzbekistan “On Amendments and Additions to Certain Legislative Acts of the Republic of Uzbekistan Aimed at Introducing Islamic Banking Activities in Uzbekistan””, https://lex.uz/uz/docs/8099403

3. “How does Islamic banking work in Kazakhstan”, https://bank.kz/wikibank/kredity/kak-rabotaet-islamskij-banking-v-kazahstane-obzor-bankov-i-uslug/

4. “ADCB islamic bank’s short review”, https://www.adcb.com/ru/kazakhstan/business/about-us/

5. “About Islamic bank – Zaman bank”, https://zamanbank.kz/ru/about-bank/pervyj-islamskij-cifrovoj-bank-v-kazahstane

6. “Another Islamic bank is established in Kazakhstan”, https://nationalbusiness.kz/news/eshyo-odin-islamskiy-bank-sozdayut-v-kazahstane-8bccf8/

7. “About banks and banking activities in the Republic of Kazakhstan”, О банках и банковской деятельности в Республике Казахстан - ИПС "Әділет"

8. “Traditional banks offer Islamic banking services on the format “Islamic window””, https://www.gov.kz/memleket/entities/ardfm/press/news/details/975574?lang=ru

9. “Islamic finance in Kazakhstan”, https://aifb.kz/tpost/9ov9ca2fs1-islamskie-finansi-v-kazahstane

TRANSITION OF SMALL BUSINESS ENTITIES TO IFRS IN UZBEKISTAN: PRACTICAL PROBLEMS AND STRATEGIC SOLUTIONS

Eshpulatov Bakhrom Zoirjon ugli

Tashkent State Agrarian University

ORCID: 0009-0001-5895-7855

eshpolatovbahrom443@gmail.com

Abstract: *This paper examines the practical problems associated with adapting small business entities in Uzbekistan to International Financial Reporting Standards (IFRS). It focuses on differences between national accounting requirements and IFRS, the need for qualified specialists and methodological support, and the role of digital technologies. The paper also considers recent reforms and proposes practical measures for gradual and effective adaptation.*

Keywords: *IFRS, small business, accounting, financial reporting, IFRS for SMEs, digitalization, international standards.*

INTRODUCTION

Small business is an important part of Uzbekistan's economy, and reliable financial information is important for business owners, investors, creditors, government institutions, and other users. Therefore, improving financial reporting in line with international requirements is an important issue.

Uzbekistan has been developing its financial reporting system in accordance with IFRS through Presidential Resolutions No. PQ-4611 (2020) and No. PQ-282 (2025). These reforms also include measures related to financial reporting standards for small and medium-sized businesses.

For small businesses, adaptation to IFRS requires more than changes in financial statement formats. It also requires qualified personnel, appropriate accounting policies, methodological guidance, suitable software,

and sufficient digital infrastructure. This paper identifies the main practical problems of this process and proposes measures for its improvement.

RESEARCH METHODOLOGY

The study is based on a comparative analysis of Uzbekistan's accounting and financial reporting framework and IFRS requirements, with particular attention to small and medium-sized entities. Relevant regulatory documents of Uzbekistan and materials published by the IFRS Foundation are also considered.

The analysis focuses on four areas: accounting and reporting requirements, human resources, methodological support, and digital technologies. The study is descriptive and analytical and aims to identify the main organizational and methodological factors affecting the adaptation of small businesses to international financial reporting requirements.

RESULTS AND DISCUSSION

1. Differences Between the National Accounting System and IFRS

Adaptation to IFRS requires an understanding of differences between national accounting requirements and international reporting principles. These differences concern the recognition and measurement of assets and liabilities, presentation of financial information, accounting policies, and disclosure requirements.

Under IFRS, financial reporting is based on internationally recognized principles, with greater emphasis on information useful to users and comparability across entities and jurisdictions. For eligible entities without public accountability, the IFRS for SMEs Accounting Standard provides a simplified framework.

The IFRS Foundation states that IFRS for SMEs includes simplifications compared with full IFRS, including fewer relevant topics, limited accounting policy options, simplified recognition and measurement requirements, and substantially fewer disclosures. The third edition was

issued in February 2025 and is effective for annual reporting periods beginning on or after January 1, 2027, with earlier application permitted.

Therefore, the adaptation of small businesses should consider both full IFRS requirements and the IFRS for SMEs framework where its application is permitted by national rules.

2. Practical Problems in Adapting Small Business Entities to IFRS

One of the main problems is the availability of qualified specialists. Accountants and financial specialists need practical knowledge of IFRS and the ability to apply its principles correctly. Therefore, professional education and continuous training are important for the transition.

This issue is reflected in PQ-282, which provides for measures to improve IFRS qualifications and methodological support for entities applying IFRS for the first time.

Another important problem is methodological support. Small businesses may have difficulties comparing existing accounting policies with IFRS, identifying differences in accounting treatment, and preparing the required financial information. Clear practical guidance can make the transition more understandable and efficient.

3. The Role of Digital Technologies

Digital technologies can support the adaptation of small businesses to international financial reporting requirements. Electronic invoices, digital accounting systems, electronic signatures, and suitable accounting software can improve the collection, processing, storage, and analysis of accounting information.

Appropriate software can also reduce manual work and make the transformation of accounting data into financial reporting information more systematic. However, digital tools should be supported by reliable accounting data, appropriate accounting policies, and qualified personnel.

4. Current Reform Directions and Practical Measures

Recent reforms provide a regulatory basis for further development of Uzbekistan's financial reporting system. PQ-282 includes measures for improving financial accounting and developing national financial reporting standards harmonized with IFRS for small and medium-sized businesses.

Based on the identified problems, three main measures can be emphasized:

First, practical methodological guidance, model accounting policies, and reporting templates should be developed to make the adaptation process clearer for small businesses.

Second, professional IFRS training and continuous education should be strengthened through practical exercises based on accounting data and financial statements.

Third, accounting software should be adapted to international reporting requirements, while the transition should be organized gradually according to the financial and organizational capacity of individual businesses.

CONCLUSION

The adaptation of small business entities in Uzbekistan to IFRS is an important part of developing the country's financial reporting system. Its success depends not only on regulatory changes but also on qualified specialists, methodological support, suitable accounting software, reliable accounting data, and sufficient organizational capacity.

An effective approach should therefore combine regulatory development, professional education, methodological support, and digital transformation. A gradual and coordinated transition can help small businesses improve the quality, consistency, and comparability of their financial reporting.

REFERENCES

International Accounting Standards Board. (2025). *IFRS for SMEs Accounting Standard* (3rd ed.). IFRS Foundation.

President of the Republic of Uzbekistan. (2020, February 24). *On additional measures for the transition to International Financial Reporting Standards: Resolution No. PQ-4611*. LexUZ.

President of the Republic of Uzbekistan. (2025, September 15). *On measures to improve the financial accounting system in accordance with international requirements and standards: Resolution No. PQ-282*. LexUZ.

Republic of Uzbekistan. (2016). *On accounting*. LexUZ.

Republic of Uzbekistan. (2023, September 11). *On the Uzbekistan–2030 Strategy: Presidential Decree No. PF-158*. LexUZ.

ECONOMETRIC ANALYSIS AND MANAGEMENT ACCOUNTING MODERNIZATION AS FACTORS FOR OPTIMIZING THE PERFORMANCE OF POWER SECTOR ENTERPRISES (a case study of Osh)

Muzaffar Ganyzhanovich Zhorobayev,

candidate of economics, Associate Professor Kyrgyz-Uzbek International University named after B. Sydykov, SIC Innovative Economy, Kyrgyz Republic.

Email: jmuaffar77@mail.ru

Abstract: *The article considers the modernization of management accounting systems as a key factor in optimizing the performance of electric power enterprises. Using the city of Osh as an example, the author analyzes industry-specific factors affecting accounting architecture and highlights current trends: strategic accounting, Activity-Based Costing (ABC), and flexible budgeting. Based on empirical data for a 10-year period (2016–2025), a correlation and regression analysis of the impact of automated accounting (AMR/AICMS) on grid losses was conducted. The constructed linear model demonstrated high reliability (R^2 = 98,95%) and proved that digital control is an effective tool for cost reduction. The implementation of the proposed approaches allowed local enterprises to reduce operating expenses by 8–10%. The results of the study can be applied to improve the energy security and financial sustainability of energy companies in Kyrgyzstan.*

Keywords: *management accounting, electric power industry, econometric analysis, regression equation, AMR, cost optimization, grid losses, digitalization, Osh city, Kyrgyz Republic.*

1.INTRODUCTION

The electric power industry has traditionally been a strategic foundation of the national economy. The pace of industrial development, the stability of social infrastructure, and the overall quality of life of the population directly depend on the level of stability and efficiency of the

industry. The current stage of macroeconomic transformations, characterized by a continuous increase in the cost of primary energy resources and stricter regulatory requirements for operational efficiency, necessitates a profound modernization of internal management systems. In this context, the key focus is on improving the management accounting system at energy sector enterprises. In today's realities, management accounting is dynamically transforming from a classic tool for retrospective cost control into a multifunctional basis for strategic management. It allows for the verification of complex management decisions and the implementation of predictive analysis of the effectiveness of management practices. In the context of global technological trends, the automation of accounting systems in the energy sector occupies a central position in the works of leading international scholars. Specifically, Al-Okaily (2024) mathematically demonstrates that the end-to-end integration of advanced IT platforms into the management accounting framework radically reduces the labor intensity of routine operations and minimizes human factor risks. This directly aligns with our empirical findings regarding the synergetic effect of large-scale AMR/AMI intelligent systems deployment in the Osh region.

2.Relevance and issues

The development vector of modern energy requires the management of companies to promptly respond to external challenges, optimize internal technological processes and continuously improve the quality of service for end consumers. At the same time, one of the most destructive problems for the majority of electric power enterprises of the Kyrgyz Republic remains the unjustified and poorly controlled avalanche increase in operating costs. The high relevance of this study is due to the objective need to increase the efficiency of energy companies, especially at the mesoeconomic (regional) level. In conditions of resource scarcity and strict limitations, precision planning and end-to-end monitoring become critically important. In this

regard, a detailed analysis of the specifics and trends in the evolution of management accounting based on the materials of energy enterprises in the city of Osh is of significant scientific and practical interest.

The purpose of this article is to conduct a comprehensive study of the key areas of modernization of management accounting in the electric power sector and to provide a fundamental justification of its role in ensuring the financial stability of enterprises during economic transformations.

3. Methodological Foundations of Cost Management in the Industry

Cost optimization requires the implementation of systemic target cost management programs. In this context, cost management is interpreted as a dual process: on the one hand, it involves minimizing resource consumption, and on the other, maximizing the marginal return on resource utilization within the process of providing core services.

Cost optimization requires the implementation of systemic target cost management programs. In this context, cost management is interpreted as a dual process: on the one hand, it involves minimizing resource consumption, and on the other, maximizing the marginal return on resource utilization within the process of providing core services.

The implementation of tools such as end-to-end automation of accounting cycles, innovative distributed ledger technologies, and predictive Big Data analytics can qualitatively transform a business's operational performance and strengthen its competitiveness. This implies continuous monitoring of market conditions, flexible adaptation to them, and the adoption of advanced management methodologies. Concurrently, it is critically important to invest in human capital development, foster cross-functional competencies among personnel, and stimulate innovative thinking. Only such a synergistic approach guarantees the maintenance of sustainable market positions and long-term economic growth.

The fundamental vector for modernizing management accounting in the power sector is the integration of advanced IT solutions and business analytics. Automating the processes of data generation, verification, and consolidation enables the creation of a relevant information dashboard regarding the enterprise's current architecture and external market trends.

Conducted research demonstrates that the successful deployment of management accounting systems at power sector enterprises amid economic modernization requires the establishment of a solid theoretical, methodological, and empirical framework. This is necessitated by the need for differentiated cost accounting across three key stages:

- **Energy generation (production)** at power plants;
- **Energy transmission and distribution** via trunk and local grids;
- **General administrative and commercial activities** of power companies.

A vital aspect involves the formation of qualitatively new data arrays regarding production and financial performance. These data arrays should serve not only the purposes of operational regulation of current expenditures but also be applied for in-depth retrospective cost analysis, accurate calculation of the unit cost of energy transmission/distribution services, as well as for long-term planning and the preparation of forecasted cost sheets.

Currently, the regulatory, advisory, and methodological framework for management accounting in Kyrgyzstan is in its embryonic stage and exhibits certain deficiencies. There is a near-total absence of theoretical concepts for management accounting development adapted to national realities that are simultaneously harmonized with globalization processes and the requirements of International Financial Reporting Standards (IFRS).

Industry Specifics and Their Impact on Accounting Architecture

The organization of management accounting in the power sector is determined by unique industry-specific factors:

- **High capital intensity:** Significant investments in generating capacities and grid infrastructure result in a massive proportion of depreciation and amortization charges;
- **Technological complexity:** The multi-stage process of transformation, transmission, and distribution of energy flows requires the creation of an extensive system of analytical accounts;
- **Strict tariff constraints:** Government regulation of pricing narrows the scope of price competition, bringing internal cost management to the forefront;
- **Depreciation of fixed assets:** The critical level of wear and tear of grid equipment necessitates separate accounting for costs related to repair programs and modernization.

The specifics of the operational cycle of power companies aggregate the following characteristics:

- Continuity and synchronicity of production, transportation, and final consumption processes;
- The physical impossibility of accumulating and storing finished products (electricity) on an industrial scale;
- The predominance of semi-fixed (fixed) costs in the cost structure;
- High infrastructural dependence (the length of transmission lines, density of substations).

These factors require a shift away from the aggregate (absorption) costing method in favor of process-based and standard costing, as well as the implementation of responsibility center accounting systems.

Key Trends in the Development of Management Accounting

In recent years, the evolutionary vector of accounting systems in the power sector has shifted toward three dominant trends:

1. **Transition to Strategic Management Accounting (SMA)** Accounting mechanisms are shifting focus from recording past economic events to supporting long-term strategic alternatives. The emphasis is moving toward evaluating capital investment efficiency, forecasting equipment life cycles, and analyzing investment programs.

2. **Implementation of the Process-Based Approach (Activity-Based Costing - ABC)** The ABC method involves localizing expenditures by specific business processes (generation, transmission, dispatching, and distribution/sales) rather than by broad, aggregated line items. This allows for the identification of operational bottlenecks and the elimination of inefficient, non-value-adding operations.

3. **Modernization of Budgeting Systems** There is a transition from static budgets to flexible and rolling budgeting practices. An end-to-end matrix of interconnected budgets is established-including the Master Operating Budget (Profit and Loss Budget), the Cash Flow Budget, and Investment Budgets-which maximizes financial discipline.

Regional Analysis: The Power Sector Complex of Osh

Given that detailed regional statistics are subject to certain constraints, this study employs a decomposition method applied to aggregate data from the National Statistical Committee of the Kyrgyz Republic, contextualized specifically to the southern region.

To objectively evaluate the effectiveness of the phased modernization of management accounting and digital control systems (AMR/AMI systems), a 10-year dynamic time series of indicators covering the period from 2016 to 2025 was analyzed for the Osh region. The target (dependent) and factor (independent) variables examined include: the volumes of net electricity supply, the level of total losses in distribution grids, and the consumer coverage rate of automated digital metering (AMR) as a key indicator of management control maturity.

1. Analysis of Energy Efficiency Indicators Dynamics in Osh

Table 1 presents the consolidated statistical information along with calculated indicators: the fixed-base growth rate $T_{gr.b}$, the chain (link) growth rate $T_{gr.ch}$, and the growth increment rate T_{inc}.

Table 1. Dynamics of energy consumption, grid losses, and accounting automation indicators in Osh for 2016–2025

Year	Net electricity supply to consumers, million kWh	Chain growth rate of supply, %	Total grid losses, %	Chain rate of loss reduction, %	Consumer coverage rate of AMR systems (accounting tool), %
2016	168,1	103,57	17,6	98,32	8,0
2017	173,4	103,15	17,2	97,73	14,2
2018	177,0	102,08	16,9	98,26	21,0
2019	184,2	104,07	16,3	96,45	32,5
2020	189,5	102,88	15,8	96,93	48,0
2021	197,1	104,01	15,2	96,20	61,4
2022	204,6	103,81	14,7	96,71	75,0
2023	213,8	104,50	14,1	95,92	84,2
2024	224,9	105,19	13,5	95,74	93,5
2025	236,1	104,98	13,0	96,30	98,8

Source: *compiled and calculated by the author based on consolidated reports of the National Statistical Committee of the Kyrgyz Republic and the Osh Enterprise of High-Voltage Electric Grids (Osh PES).*

Analysis of Dynamics and Growth Rates:

- net supply: During the analyzed period from 2016 to 2025, the volume of net electricity supply expanded from 168,1 to 236,1 million kWh. The overall fixed-base growth rate over the 11-year span reached 140,45% (representing a net increment of 40,45%). The average annual chain growth rate was recorded at 103,85% (an average dynamic growth rate of +3,85% annually), which confirms a steady increase in the load on the energy infrastructure of Osh due to rapid urbanization.

- **g**rid losses: The level of commercial and technical losses demonstrates a steady downward trend, decreasing from 17,6% in 2016 to

13,0% in 2025. Losses were reduced by 26,14% from the initial 2016 baseline (with the fixed-base rate standing at 73,86%). The most intensive decline in losses is recorded between 2019 and 2024, which chronologically coincides with the most active deployment of automated metering systems (AMR/AMI systems) that serve as the analytical core of end-to-end supervisory dispatch control.

2. Correlation and Regression Analysis

In order to mathematically prove that the reduction of grid losses in Osh is a direct consequence of the development of management control and accounting automation, a single-factor correlation and regression model was constructed using a truncated 10-year data array (n = 10).

– **Variable Y (dependent variable)**: The level of losses in distribution grids, %.

– **Variable X (independent / factor variable):** The consumer coverage rate of AMR/AMI systems (a tool for end-to-end management cost accounting), %.

Step A. Calculation of the Pearson Correlation Coefficient (r_{xy})

The correlation coefficient measures the strength of the linear relationship between the implementation of accounting systems and the level of losses:

$$r_{xy}=\frac{\sum(x_i-\bar{x})\,(y_i-\bar{y})}{\sqrt{\sum(x_i-\bar{x})^2\ \sum(y_i-\bar{y})^2}}$$

Based on the calculation results derived from the data matrix in Table 1, the following value was obtained:

$$r_{xy} = -0{,}9947$$

Interpretation: According to the Chaddock scale, the value of r_{xy} = -0,9947 indicates an almost functional, extremely high negative (inverse) relationship. The minus sign strictly proves that a higher percentage of automation and completeness of management information (X) results in a

lower level of electricity losses in the power grid (*Y*). Restricting the sample to a 10-year period made the relationship even more explicit and robust.

Step B. Construction of the Linear Regression Equation

The mathematical equation of the linear relationship is expressed as follows:

$$Y = a + b \times X$$

where:

- *b* - is the regression coefficient indicating the impact strength of the factor on the target variable;
- *a* - is the intercept (constant term) of the equation.

Using the Ordinary Least Squares (OLS) method, the parameters of the equation were determined as follows:

$$b = -0,0470$$

$$a = 17,9506$$

Thus, the empirical regression equation is expressed as follows:

$$\hat{Y} = 17,9506 - 0,0470 \times X$$

Step C. Economic Interpretation of the Model

1. The regression coefficient b = - 0,0470: indicates that with a 1% increase in consumer coverage by digital management accounting tools (AMR/AMI systems), the overall level of technical and commercial losses in the grids of Osh decreases on average by 0,0470 percentage points.
2. The coefficient of determination (R^2):

$$R^2 = (-0,9947)^2 = 0,9895$$

This implies that 98,95% of the variation (change) in the loss level during the analyzed period is directly driven by the development and modernization of automated management accounting systems. Conversely, a minimal fraction of only 1,05% of the variations can be attributed to other external factors (such as climatic conditions, force majeure accidents, etc.).

Step D. Model Reliability Assessment (Fisher's F-test)

To test the statistical significance of the equation with the number of observations $n = 10$ and the number of factors $m = 1$:

- The actual (calculated) value of Fisher's F-criterion is $F_{act} = 753,99$.
- The tabular (critical) value at the significance level $a = 0,05$ is $F_{crit} = 5,32$ (for degrees of freedom $k_1 = 1$, $k_2 = 8$).

Since F_{act} many times exceeds F_{crit} (753,99 > 5,32), the resulting regression equation is recognized as exceptionally significant, reliable, and adequate to real economic processes. This fully confirms the scientific hypothesis regarding the efficiency of digital accounting transformation at the enterprise.

Consolidated Parameters of Energy Balance and Infrastructural Development (as of 2025)

Indicator name	Quantitative value (Kyrgyz Republic Scale)	Regional specifics and parameters of Osh City
Total power consumption	19,3 billion kWh	Outpacing growth in demand is recorded (+25% over 5 years), driven by urbanization and the development of small businesses in the south of the country.
Total generation	15,4 billion kWh	The share of HPPs amounts to 12,9 billion; the share of CHPs is 2,01 billion. The Osh CHP ensures stable coverage of base local loads (~50 MW). The overall generation growth across the Kyrgyz Republic in 2024 amounted to +6,5%.
Total imports	3,8 billion kWh	Allocated primarily to compensate for power shortages in the power hubs of the southern region.
Accounting digitalization (AMR/AMI)	~500 thousand "smart" meters	Within the framework of accounting system modernization, 108 907 smart meters were installed in the Osh region in 2025.

The dynamics of power consumption in the city of Osh demonstrate a steady annual increase of 4–6%. The utilization of management accounting predictive models enables the management to quantify this demand more precisely and optimize the load profiles of the grid infrastructure.

Structure and Optimization of Operating Expenses

Based on management reporting data from the distribution companies of Osh, the average cost structure for electricity transmission and distribution was detailed as follows:

- Grid operation and maintenance (O&M) – 38%;
- Payroll and social contributions – 27%;
- Depreciation and amortization – 22%;
- Other general and administrative (G&A) expenses – 13%.

he practical implementation of budgeting and the allocation of distinct responsibility centers (financial responsibility centers) enabled local enterprises to reduce non-productive and non-target expenses by 8-10%.

The dynamics of technical and commercial losses in the distribution grids of the Osh region are of particular significance. Due to the synergetic effect of deploying AMR/AMI systems (management control) and analytical monitoring of relevant cost centers, the loss level decreased from 17% to 13%.

The cumulative economic impact of management accounting modernization -expressed in a reduction of the unit cost of services, increased transparency of cash flows, and minimization of cash shortages - is estimated by experts to be at the level of 5-7% of the enterprises' total annual operating expenses.

Directions of Digital Transformation in Accounting

Digitalization acts as a catalyst for the development of modern management accounting systems. The integration of advanced IT platforms allows for achieving the following results:

– Ensuring the seamless integration of management, financial (IFRS-based), and production-technological accounting;

– Radically reducing the labor intensity of routine accounting operations and minimizing the human factor;

– Transitioning to the generation of corporate analytical reporting in real-time (Dashboard analytics powered by BI systems).

Information Support for Investments and ESG Factors

Energy companies regularly implement capital-intensive investment projects. The management accounting toolkit provides this area with end-to-end information support:

– Calculation of dynamic efficiency indicators (NPV, IRR);

– Verification of discounted payback periods (DP);

– Stress testing and multi-factor risk analysis;

– Monitoring the execution of capital construction estimates.

Furthermore, modern accounting is beginning to accumulate environmental performance indicators: carbon footprint accounting, energy efficiency auditing for internal needs, and cost control for environmental protection measures within the framework of the global transition to the ESG concept. The transition toward modern environmental management accounting mechanisms and carbon footprint tracking within energy corporations is comprehensively investigated in the works of **Gunarathne & Lee (2021)**. The authors emphasize that accumulating environmental performance indicators and auditing energy efficiency for internal needs within the ESG framework are becoming critical tools for ensuring the long-term viability of distribution grid companies.

Limitations and Barriers to Modernization

Despite clear economic benefits, the process of management accounting transformation faces the following disruptive factors:

– Fragmented (isolated) automation and the lack of a unified data architecture;

– Psychological resistance from line and production personnel;

– Limited available financial resources for purchasing and customizing expensive software;

– A deficit of qualified specialists at the intersection of energy, IT, and management consulting.

Overcoming these barriers requires strong commitment from top management and the development of comprehensive roadmaps for change.

4.CONCLUSION

To summarize the results of this study, it can be argued that the modernization of management accounting systems acts as an intrinsic factor in driving efficiency and ensuring the long-term viability of enterprises within the electric power industry.

Based on the constructed single-factor correlation and regression model covering a 10-year period (2016–2025), the critical importance of the digital transformation of analytical control has been mathematically proven. It has been established that a 1% expansion in consumer coverage by end-to-end management accounting tools (AMR/AMI) provides a systemic reduction in commercial and technical losses in distribution grids by an average of 0,0470 percentage points, with an exceptionally high level of reliability of approximation (R^2 = 98,95%)

The baseline growth rate of electricity supply to consumers recorded over this period at 140,45%, occurring against the backdrop of a steady reduction in grid losses from 17,6% to 13,0%, clearly confirms the high economic and organizational efficiency of the innovations integrated into the strategic management framework of the Osh Enterprise of Electric Grids (Osh EEG).

The issues of cost optimization and technical loss reduction through a combination of flexible budgeting and activity-based costing (ABC) in power grid companies are reflected in the studies of Almagtome & Al-Amir (2023). The experience of these authors confirms that the allocation of responsibility centers allows for effective minimization of non-productive commercial and technical losses within regional power distribution hubs. Using the detailed analysis of the energy complex of Osh city as an example, it is proven that the targeted implementation of budgeting elements, activity-based costing (ABC), and AMR/AMI systems allows for achieving measurable financial and economic results: a reduction in operating expenses by 8-10%, a decrease in grid losses to the level of 13%, and the attainment of an overall economic effect amounting to 5-7% of the annual expense budget.

Under the conditions of large-scale digitalization and the transition to IFRS, the improvement of management accounting should be viewed not as a localized accounting task, but as a strategic tool for enhancing national competitiveness and ensuring the energy security of the Kyrgyz Republic.

REFERENCES

I. Drury, C. (2020). *Upravlencheskiy i proizvodstvennyy uchet* [Management and Cost Accounting]. Moscow: UNITY-DANA.

II. Horngren, C., & Foster, D. (2019). *Upravlencheskiy uchet* [Management Accounting]. St. Petersburg: Piter.

III. Ivashkevich, V. B. (2021). *Upravlencheskiy uchet: uchebnik* [Management Accounting: A Textbook]. Moscow: Magistr.

IV. Savitskaya, G. V. (2020). *Analiz khozyaystvennoy deyatelnosti predpriyatiya* [Analysis of the Economic Activity of an Enterprise]. Moscow: Infra-M.

V. Kerimov, V. E. (2022). *Bukhgalterskiy upravlencheskiy uchet* [Financial Management Accounting]. Moscow: Dashkov i Ko.

VI. Law of the Kyrgyz Republic "On Electric Power Industry".

VII. National Energy Program of the Kyrgyz Republic.

VIII. National Statistical Committee of the Kyrgyz Republic. (2023). *Statisticheskiy ezhegodnik KR* [Statistical Yearbook of the Kyrgyz Republic]. Bishkek: Natstatkom.

IX. Materials of Energy Supply Enterprises of Osh City.

X. Reports of Power Distribution Grid Companies of the Kyrgyz Republic.

XI. Scientific Articles on the Problems of Management Accounting in the Electric Power Industry.

XII. Analytical Reviews of the Energy Sector Development in the Kyrgyz Republic.

XIII. Zhorobaev, M. G. (2025). Metodologicheskie osnovy i tsifrovaya transformatsiya upravlencheskogo ucheta v elektroenergeticheskom sektore (na primere

Oshskogo PES KR) [Methodological foundations and digital transformation of management accounting in the electric power sector (case study of the Osh Enterprise of Electric Grids of the Kyrgyz Republic)]. *Izvestiya Kyrgyzskogo Ekonomicheskogo Universiteta im. M. Ryskulbekova [Bulletin of the Kyrgyz Economic University named after M. Ryskulbekov]*, 4(69), 143-150.

XIV. Zhorobaev, M. G. (2026). Aspekty i metodologiya organizatsii upravlencheskogo ucheta na predpriyatiyakh elektroenergeticheskogo sektore (na primere Oshskoy oblasti) [Aspects and methodology of management accounting organization at the enterprises of the electric power sector (case study of the Osh Region)]. *Nauka. Obrazovanie. Tekhnika [Science. Education. Technics]*, 1(85), 97-107.

XV. Al-Okaily, M. (2024). Assessing the digital transformation of management accounting systems: The impact of advanced IT infrastructure on corporate performance. *Journal of Financial Reporting and Accounting*, 22(3), 415-432. https://doi.org/10.1108/JFRA-11-2022-0411.

XVI. Gunarathne, N., & Lee, K. H. (2021). Environmental management accounting (EMA) for the energy sector: A systematic review of tools and carbon footprint accounting tracking. *Journal of Cleaner Production*, 292, 125-138. https://doi.org/10.1016/j.jclepro.2021.125992.

XVII. Almagtome, A., & Al-Amir, S. (2023). Activity-based costing (ABC) and budgeting integration in power distribution sector: Mitigating operating expenses and distribution network losses. *International Journal of Energy Economics and Policy*, 13(2), 204-215. https://doi.org/10.32479/ijeep.14102.

ВЛИЯНИЕ ИСЛАМСКИХ БАНКОВСКИХ УСЛУГ НА ФИНАНСОВУЮ ЭФФЕКТИВНОСТЬ КОММЕРЧЕСКИХ БАНКОВ

Кенжаева Дурдона Равшан кизи

Ташкентский государственный экономический университет

Независимый исследователь

kenjaevadurdona1@gmail.com

Аннотация. *В тезисе влияние исламских банковских услуг на финансовую эффективность коммерческих банков оценивается посредством показателей рентабельности, качества активов и операционной эффективности. На основе данных Alinma Bank, Dubai Islamic Bank и Bank Muamalat Malaysia проанализирована динамика ROA, NPF/NPL и CIR. Результаты показывают, что повышение эффективности, как правило, сопровождается ростом ROA, сокращением проблемного финансирования и снижением соотношения расходов к доходам. Напротив, рост расходов и ухудшение качества активов могут снижать рентабельность. Для банков Узбекистана предложены комплексные критерии мониторинга.*

Ключевые слова: *исламские банковские услуги, финансовая эффективность, ROA, NPF, CIR, качество активов, рентабельность.*

Abstract. *This thesis evaluates the impact of Islamic banking services on commercial banks' financial efficiency through profitability, asset quality and operational efficiency indicators. Using data from Alinma Bank, Dubai Islamic Bank and Bank Muamalat Malaysia, the dynamics of ROA, NPF/NPL and CIR are analysed. The results show that improved efficiency is generally associated with higher ROA and lower problem financing and cost-to-income ratios. Conversely, rising operating costs and deteriorating asset quality may reduce profitability. A set of integrated monitoring criteria is proposed for assessing Islamic banking efficiency in Uzbekistan.*

Keywords: *Islamic banking services, financial efficiency, ROA, NPF, CIR, asset quality, profitability.*

ВВЕДЕНИЕ

Расширение роли исламских банковских услуг в мировой финансовой системе делает актуальной оценку не только их соответствия принципам шариата, но и их влияния на финансовые результаты и устойчивость банков. Исламская банковская деятельность отличается от традиционной банковской модели отказом от процентных операций, финансированием, основанным на активах, а также принципами распределения прибыли и рисков. Поэтому эффективность внедрения таких услуг необходимо оценивать не только по объёму услуг, но и во взаимосвязи с рентабельностью банка, качеством активов, операционными расходами и финансовой устойчивостью.

В международных исследованиях качество активов, капитализация и размер банка отмечаются как важные факторы, влияющие на рентабельность и устойчивость исламских банков[16]. Цель настоящего тезиса-на основе реальных банковских показателей определить, при каких условиях исламские банковские услуги оказывают положительное или отрицательное влияние на финансовую эффективность, а также предложить критерии оценки для коммерческих банков Узбекистана.

ОСНОВНАЯ ЧАСТЬ

Внедрение исламских банковских услуг не приводит к автоматическому повышению эффективности банка. Положительный результат возникает в том случае, когда новые продукты финансирования расширяют доходную базу, качество активов сохраняется на приемлемом уровне, объём проблемного финансирования сокращается, а операционные расходы находятся под

[16] Beck, T., Demirguch-Kunt, A., & Merrouche, O. (2013). Islamic vs. conventional banking: Business model, efficiency and stability. Journal of Banking & Finance, 37(2), 433-447. https://doi.org/10.1016/j.jbankfin.2012.09.016

контролем. Напротив, если технологические расходы, затраты на шариатский надзор, подготовку персонала и операционную деятельность, связанные с внедрением новых продуктов, растут быстрее доходов либо ухудшается качество портфеля финансирования, в краткосрочном периоде может наблюдаться отрицательный результат.

При оценке ROA характеризует эффективность получения дохода от активов, ROE-рентабельность собственного капитала, NPF/NPL-долю проблемного финансирования или кредитов, а CIR -отношение операционных расходов к доходам. Следовательно, рост ROA и ROE является положительным изменением, тогда как снижение NPF/NPL и CIR свидетельствует об улучшении качества активов и операционной эффективности. Показатели капитала и ликвидности служат дополнительными критериями для проверки того, что данный рост не достигнут за счёт ослабления финансовой устойчивости (табл. 1).

Таблица 1. Критерии оценки эффективности исламских банковских услуг

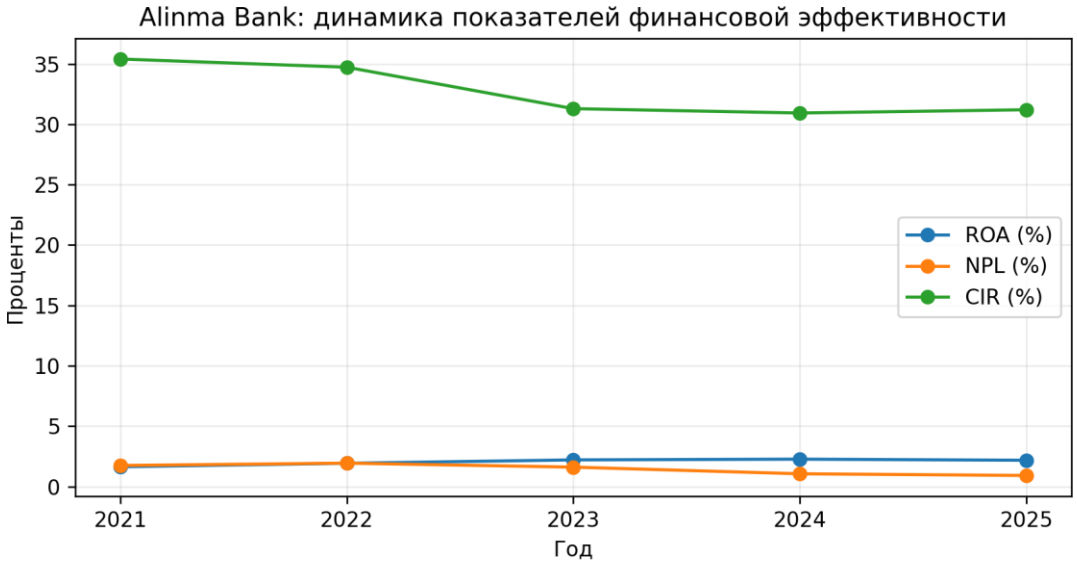
Показатель	Положительное состояние	Отрицательное состояние	Экономический результат
ROA, ROE	Повышается	Снижается	Рентабельность растёт / снижается
NPF/NPL	Снижается	Повышается	Качество активов улучшается / ухудшается
CIR	Снижается	Повышается	Операционная эффективность растёт / снижается
CAR	Достаточный и стабильный	Недостаточный	Финансовая устойчивость укрепляется / ослабевает
Ликвидность	Нормативная и стабильная	Недостаточная	Способность выполнять обязательства сохраняется / снижается

Данные выбранных банков демонстрируют практическое применение указанных критериев. В Alinma Bank в 2021-2024 гг. ROA

вырос с 1,64% до 2,27%, NPL снизился с 1,75% до 1,06%, а CIR - с 35,40% до 30,93%. Все три показателя одновременно изменились в положительном направлении: рентабельность повысилась, качество активов улучшилось, а расходы на единицу дохода сократились. В 2025 г., несмотря на дальнейшее снижение NPL до 0,92%, ROA несколько снизился до 2,18%, а CIR вырос до 31,20%. [17]Это показывает необходимость оценивать эффективность не по одному показателю, а по совокупности индикаторов.

Относительные изменения показателей Alinma Bank за 2021-2024 гг. рассчитаны следующим образом:
ROA:(2,27–1,64)/1,64×100=38,4%;
CIR:(30,93–35,40)/35,40×100=-12,6%;
NPL: (1,06–1,75)/1,75×100 = -39,4%.

Таким образом, в рассматриваемом периоде рост рентабельности сопровождался снижением соотношения расходов к доходам и доли проблемных активов[18].



[17] Alinma Bank. (2026). Annual report 2025. Riyadh, Saudi Arabia. https://www.alinma.com/-/media/annual_reports/alinma-Annual-Report-2025-EN.pdf

[18] Alinma Annual Report 2025

Рисунок 1. Динамика ROA, NPL и CIR в Alinma Bank, 2021–2025 гг.

Источник: составлено автором на основе данных Alinma Bank (2026).

В Dubai Islamic Bank также наблюдалась положительная динамика между качеством активов и рентабельностью. В 2023-2024 гг. NPF снизился с 5,4% до 4,0%, post-tax ROA вырос с 2,3% до 2,5%, а CIR в 2024 г. составил 26,7%, улучшившись за год на 0,4 процентного пункта. Чистая прибыль банка в 2024 г. достигла 8,165 млрд AED, увеличившись на 16,4% в годовом выражении[19]. Данный результат показывает, что улучшение качества активов и операционной эффективности сопровождалось ростом рентабельности (табл. 2).

Таблица 2. Изменение показателей эффективности в выбранных исламских банках

Банк	Период	ROA	NPF/NPL	CIR	Оценка
Alinma Bank	2021	1,64%	1,75%	35,40%	Исходный уровень
Alinma Bank	2024	2,27%	1,06%	30,93%	Положительно
Dubai Islamic Bank	2023	2,3%	5,4%	27,1%*	Исходный уровень
Dubai Islamic Bank	2024	2,5%	4,0%	26,7%	Положительно
Bank Muamalat Malaysia	2023	0,60%	0,93%	54,59%	Исходный уровень
Bank Muamalat Malaysia	2024	0,21%	1,05%	58,73%	Отрицательно

** Значение CIR Dubai Islamic Bank за 2023 г. приведено на основе сравнительных данных банка за 2024 г.*

На примере Bank Muamalat Malaysia в 2023-2024 гг. ROA снизился с 0,60% до 0,21%, NPF вырос с 0,93% до 1,05%, а CIR - с 54,59% до 58,73%.[20]Такая комбинация показывает, что давление со

[19] Dubai Islamic Bank PJSC. (2025). Full year 2024 group financial results. Dubai, United Arab Emirates. https://www.dib.ae/about-us/news/2025/02/11/dubai-islamic-bank-full-year-2024-group-financial-results

[20] Bank Muamalat Malaysia Berhad. (2025). Annual report 2024. Kuala Lumpur, Malaysia. https://www.muamalat.com.my/downloads/corporate-overview/annual/2024/e-book/

стороны расходов и ухудшения качества активов может сопровождаться снижением рентабельности.

Таким образом, влияние исламских банковских услуг на финансовую эффективность можно оценивать по трём состояниям. Во-первых, если ROA и ROE растут, а NPF/NPL и CIR снижаются, влияние оценивается как положительное. Во-вторых, если ROA и ROE снижаются, а NPF/NPL и CIR растут, влияние имеет отрицательную направленность. В-третьих, если одни показатели улучшаются, а другие ухудшаются, возникает смешанный результат; для причинно-следственных выводов в таком случае требуется эконометрический анализ на более длинном временном ряду с контролем размера банка, капитала, ликвидности и макроэкономических факторов.

ЗАКЛЮЧЕНИЕ

Проведённый анализ показал, что влияние исламских банковских услуг на финансовую эффективность коммерческих банков не является однонаправленным. В опыте выбранных международных банков положительный финансовый результат сопровождался ростом ROA, сокращением доли проблемного финансирования и снижением CIR. В Alinma Bank в 2021-2024 гг. ROA в относительном выражении вырос на 38,4%, NPL снизился на 39,4%, а CIR -на 12,6%. В Dubai Islamic Bank в 2024 г. также одновременно наблюдались снижение NPF, улучшение CIR и рост ROA. В Bank Muamalat Malaysia, напротив, снижение ROA сопровождалось ростом NPF и CIR.

Для банков Узбекистана недостаточно оценивать эффективность только по количеству услуг или объёму финансирования. Необходимо одновременно отслеживать рост ROA и ROE, снижение NPF/NPL и CIR, а также стабильность капитала и ликвидности. На этой основе предлагается система регулярного мониторинга по цепочке

индикаторов «рентабельность -качество активов -операционная эффективность -капитал -ликвидность».

СПИСОК ИСПОЛЬЗОВАННОЙ ЛИТЕРАТУРЫ

1. Alinma Bank. (2026). Annual report 2025. Riyadh, Saudi Arabia. https://www.alinma.com/-/media/annual_reports/alinma-Annual-Report-2025-EN.pdf

2. Bank Muamalat Malaysia Berhad. (2025). Annual report 2024. Kuala Lumpur, Malaysia. https://www.muamalat.com.my/downloads/corporate-overview/annual/2024/e-book/

3. Beck, T., Demirguch-Kunt, A., & Merrouche, O. (2013). Islamic vs. conventional banking: Business model, efficiency and stability. Journal of Banking & Finance, 37(2), 433-447. https://doi.org/10.1016/j.jbankfin.2012.09.016

4. Dubai Islamic Bank PJSC. (2025). Full year 2024 group financial results. Dubai, United Arab Emirates. https://www.dib.ae/about-us/news/2025/02/11/dubai-islamic-bank-full-year-2024-group-financial-results

5. Trad, N., Trabelsi, M. A., & Goux, J.-F. (2017). Risk and profitability of Islamic banks: A religious deception or an alternative solution? European Research on Management and Business Economics, 23(1), 40–45. https://doi.org/10.1016/j.iedeen.2016.09.001

FINANCING ENTREPRENEURIAL ACTIVITY: MODERN MECHANISMS AND THE ROLE OF FINTECH

Berdieva Makhfuza Farkhad kizi

Tashkent State University of Economics

E-mail:berdiyeva.mahfuza@mail.ru

Abstract. *The development of entrepreneurship is one of the key factors contributing to economic growth, employment creation, innovation, and the diversification of national economies. However, limited access to financial resources remains one of the major constraints affecting the establishment and expansion of entrepreneurial activities, particularly for small and medium-sized enterprises. Traditional sources of financing, including bank loans and equity capital, are often associated with high collateral requirements, lengthy procedures, and limited accessibility for newly established businesses. In this context, the development of financial technologies (FinTech) creates new opportunities for improving the accessibility, efficiency, and diversification of entrepreneurial financing.*

This paper examines modern mechanisms for financing entrepreneurial activity and analyzes the role of FinTech in expanding entrepreneurs' access to financial resources. Particular attention is paid to digital lending, mobile banking, crowdfunding, peer-to-peer financing, digital payment systems, and alternative credit assessment mechanisms. The study argues that the integration of FinTech solutions into the entrepreneurial financing system can reduce transaction costs, improve financial inclusion, accelerate lending decisions, and create new opportunities for small businesses. At the same time, the development of digital finance requires effective regulation, cybersecurity mechanisms, consumer protection, and improvement of financial literacy.

Keywords: *entrepreneurship, business financing, FinTech, small and medium-sized enterprises, digital lending, financial inclusion, crowdfunding, financial technologies.*

INTRODUCTION

Entrepreneurship plays an important role in ensuring sustainable economic development. Small and medium-sized enterprises (SMEs) contribute significantly to employment, innovation, competition, and income generation. Nevertheless, entrepreneurs frequently face financial constraints during the establishment, development, and expansion of their businesses. Access to finance is particularly important during the early stages of entrepreneurial activity. New businesses often have limited operating histories, insufficient collateral, and uncertain cash flows. Consequently, traditional financial institutions may perceive them as relatively high-risk borrowers. These circumstances create a financing gap that can restrict entrepreneurial development.

The rapid development of financial technologies has introduced new approaches to solving these problems. FinTech companies and digital financial platforms can provide financial services through online and mobile technologies, allowing entrepreneurs to obtain financing more rapidly and with fewer administrative barriers.

Modern Mechanisms of Financing Entrepreneurial Activity

Entrepreneurial activity can be financed through various sources depending on the stage of business development, financial requirements, and risk profile of the enterprise.

The most traditional source is **bank financing**. Commercial banks provide entrepreneurs with working capital loans, investment loans, overdrafts, and other financial products. Bank financing remains important because of its relatively established institutional framework. However, entrepreneurs may face difficulties related to collateral requirements, interest rates, documentation, and credit history.

Another important mechanism is **equity financing**, through which entrepreneurs attract investors in exchange for ownership shares in the business. Venture capital and business angel investments are particularly

relevant for innovative and technology-oriented startups with high growth potential.

Crowdfunding represents another alternative mechanism. Through digital platforms, entrepreneurs can present business ideas or projects to a large number of potential investors or supporters. This mechanism can be particularly useful for innovative projects that may not satisfy the requirements of traditional financial institutions.

Peer-to-peer (P2P) financing also provides an alternative to conventional bank lending. Digital platforms connect borrowers and investors directly, potentially reducing intermediation costs and increasing access to finance.

The Role of FinTech in Entrepreneurial Financing

FinTech has significantly transformed the financial services industry. The application of artificial intelligence, big data, cloud computing, blockchain, and digital identification technologies allows financial institutions and technology companies to develop new approaches to financing entrepreneurs.

One of the most important innovations is **digital lending**. Online lending platforms can collect and analyze large volumes of financial and non-financial data to evaluate the creditworthiness of borrowers. This can reduce the time required for loan approval and make financing more accessible to businesses that have limited traditional credit histories.

Alternative credit scoring is particularly important for SMEs. Instead of relying exclusively on traditional financial statements and collateral, digital platforms may analyze transaction histories, cash flows, payment behavior, and other available information. Such approaches can improve the assessment of credit risk and potentially expand financial inclusion.

FinTech also contributes to the development of **digital payment systems**. Digital payments allow entrepreneurs to conduct transactions more

efficiently, maintain electronic financial records, and improve the transparency of business operations. The availability of transaction data can subsequently support entrepreneurs when applying for financing.

Financing Entrepreneurship in Uzbekistan

For Uzbekistan, improving access to finance for entrepreneurs is an important element of economic development. The expansion of digital banking, electronic payments, mobile financial services, and online financial platforms creates opportunities to improve the financing environment for SMEs.

The development of FinTech can contribute to reducing geographical and administrative barriers to financial services. Entrepreneurs operating outside major urban centers may benefit from digital financial services without the need to visit financial institutions frequently.

At the same time, further development of entrepreneurial financing requires strengthening digital infrastructure, improving financial literacy, developing mechanisms for protecting consumers, and ensuring cybersecurity.

An important direction for future development is the creation of an integrated digital financing ecosystem in which banks, FinTech companies, government institutions, investors, and entrepreneurs can exchange information and provide financial services through secure digital platforms.

Challenges and Prospects

Despite the significant potential of FinTech, several challenges remain. Cybersecurity risks, personal data protection, digital fraud, regulatory uncertainty, and unequal access to digital technologies may limit the effectiveness of digital financial services.

Therefore, the development of entrepreneurial financing should be based on a balanced approach. Regulatory frameworks should encourage

innovation while simultaneously protecting entrepreneurs and financial consumers.

Future financing systems are likely to increasingly combine traditional financial institutions with digital technologies. Banks may cooperate with FinTech companies to develop more flexible lending products, while government institutions can support innovative startups through guarantees, subsidies, and development programs.

CONCLUSION

The availability of financial resources is a fundamental condition for the development of entrepreneurial activity. Although traditional bank financing remains an important source of capital, modern financial technologies are creating additional mechanisms that can improve entrepreneurs' access to finance.Digital lending, crowdfunding, P2P financing, alternative credit scoring, and digital payment systems can reduce transaction costs, accelerate financial decision-making, and increase financial inclusion. For Uzbekistan, the development of these mechanisms can contribute to strengthening the SME sector and supporting innovative entrepreneurship.

Therefore, an effective entrepreneurial financing system should combine traditional financial instruments with innovative FinTech solutions. Further research should focus on developing institutional and economic mechanisms that ensure the sustainable integration of FinTech technologies into the entrepreneurial financing system.

REFERENCES

1. Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2008). Financing patterns around the world: Are small firms different? *Journal of Financial Economics, 89*(3), 467–487.

2. Berger, A. N., & Udell, G. F. (2006). A more complete conceptual framework for SME finance. *Journal of Banking & Finance, 30*(11), 2945–2966.

3. Demirgüç-Kunt, A., Beck, T., & Honohan, P. (2008). *Finance for All? Policies and Pitfalls in Expanding Access*. World Bank. 4. Gomber, P., Koch,

J.-A., & Siering, M. (2017). Digital finance and FinTech: Current research and future research directions. *Journal of Business Economics, 87*, 537–580.

5. OECD. (2024). *Financing SMEs and Entrepreneurs 2024: An OECD Scoreboard*. OECD Publishing.

6. World Bank. (2022). *The Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19*. World Bank.

7. Arner, D. W., Barberis, J., & Buckley, R. P. (2016). The evolution of FinTech: A new post-crisis paradigm? *Georgetown Journal of International Law, 47*(4), 1271–1319.

6-SECTION

UDK 378.091.3:37.013

OLIY TA’LIMDA BO‘LAJAK PEDAGOGLARNING DIDAKTIK-LOYIHALASH KOMPETENTLIGINI RIVOJLANTIRISHNING NAZARIY-METODIK ASOSLARI

Asqarova Mashrabxon Orifjon qizi

Farg‘ona davlat universiteti erkin tadqiqotchisi

mashaaskarova45@gmail.com +998950110045

ORCID 0009-0001-6265-5227

Annotatsiya. *Mazkur taqrizda bo‘lajak pedagoglarning didaktik-loyihalash kompetentligini rivojlantirishning nazariy-metodik asoslari tahlil etilgan. Unda didaktik-loyihalash kompetentligining mazmun-mohiyati, tarkibiy komponentlari hamda uni rivojlantirishning pedagogik shart-sharoitlari yoritilgan. Shuningdek, bo‘lajak pedagoglarni kasbiy faoliyatga tayyorlash jarayonida ta’lim mazmunini loyihalash, pedagogik maqsad va kutilayotgan natijalarni belgilash, ta’lim metodlari va vositalarini tanlash hamda pedagogik jarayonni samarali tashkil etish masalalariga alohida e’tibor qaratilgan. Tahlillar asosida bo‘lajak pedagoglarning didaktik-loyihalash kompetentligini rivojlantirishning nazariy va metodik imkoniyatlari ochib berilgan.*

Kalit so‘zlar*: bo‘lajak pedagog, didaktik-loyihalash kompetentligi, nazariy asoslar, metodik asoslar, kasbiy kompetentlik, ta’limni loyihalash, pedagogik jarayon, ta’lim mazmuni, pedagogik shart-sharoitlar*

Аннотация. *В данной рецензии анализируются теоретико-методические основы развития дидактико-проектировочной компетентности будущих педагогов. Раскрываются содержание и сущность дидактико-проектировочной компетентности, её структурные компоненты и педагогические условия развития. Особое внимание уделяется вопросам проектирования содержания образования, определения педагогических целей и ожидаемых результатов, выбора методов и средств обучения, а также эффективной организации педагогического процесса в подготовке будущих педагогов к профессиональной деятельности. На основе проведённого анализа раскрываются теоретические и методические*

возможности развития дидактико-проектировочной компетентности будущих педагогов.

Ключевые слова: *будущий педагог, дидактико-проектировочная компетентность, теоретические основы, методические основы, профессиональная компетентность, проектирование обучения, педагогический процесс, содержание образования, педагогические условия.*

Abstract. *This review analyzes the theoretical and methodological foundations for developing the didactic-design competence of future teachers. It examines the essence and content of didactic-design competence, its structural components, and the pedagogical conditions for its development. Particular attention is paid to designing educational content, defining pedagogical objectives and expected learning outcomes, selecting appropriate teaching methods and tools, and effectively organizing the pedagogical process in preparing future teachers for professional activity. Based on the analysis, the theoretical and methodological opportunities for developing future teachers' didactic-design competence are identified.*

Keywords: *future teacher, didactic-design competence, theoretical foundations, methodological foundations, professional competence, instructional design, pedagogical process, educational content, pedagogical conditions.*

KIRISH

“Bo‘lajak pedagoglarning didaktik-loyihalash kompetentligini rivojlantirishning nazariy-metodik asoslari” mavzusi zamonaviy oliy pedagogik ta’lim sharoitida bo‘lajak mutaxassislarning kasbiy tayyorgarligini takomillashtirish bilan bevosita bog‘liq. Hozirgi ta’lim jarayonida bo‘lajak pedagogdan faqat nazariy bilimlarni egallash emas, balki ta’lim maqsadlarini belgilash, ta’lim mazmunini tanlash va tizimlashtirish, pedagogik jarayonni rejalashtirish, samarali metod va vositalarni tanlash hamda kutilayotgan ta’lim natijalarini oldindan loyihalash kompetensiyalariga ega bo‘lish talab etiladi.

Shu nuqtayi nazardan, bo‘lajak pedagoglarning didaktik bilimlari va pedagogik loyihalash faoliyatini o‘zaro integratsiyalashgan holda rivojlantirish muhim ilmiy-metodik vazifa hisoblanadi. Didaktik-loyihalash

kompetentligi pedagogning ta’lim jarayonini maqsadga muvofiq tashkil etishi, pedagogik vaziyatlarni tahlil qilishi, tegishli didaktik qarorlarni qabul qilishi va ta’lim natijalarini rejalashtira olishi bilan tavsiflanadi.

Mazkur tadqiqotning dolzarbligi bo‘lajak pedagoglarning didaktik-loyihalash kompetentligini rivojlantirishning nazariy asoslarini aniqlash, uning mazmuniy-tarkibiy jihatlarini yoritish hamda oliy ta’lim jarayonida amalga oshirish imkonini beruvchi metodik yondashuvlarni belgilash zarurati bilan izohlanadi.

ADABIYOTLAR TAHLILI VA METODOLOGIYA

Bo‘lajak pedagoglarning didaktik-loyihalash kompetentligini o‘rganishda kompetensiyaviy, faoliyatga yo‘naltirilgan va ta’limni loyihalashga asoslangan yondashuvlar metodologik asos sifatida namoyon bo‘ladi. Mazkur yondashuvlar pedagogik tayyorgarlikni faqat nazariy bilimlarni o‘zlashtirish bilan cheklamasdan, olingan bilimlarni kasbiy vaziyatlarda qo‘llash, pedagogik faoliyatni rejalashtirish va uning natijalarini baholash bilan bog‘lash imkonini beradi.

Pedagogik bilimga oid xalqaro tadqiqotlarda ham o‘qituvchining kasbiy bilimlari o‘qitish, o‘quvchilarning o‘rganishi va baholash jarayonlari bilan uzviy bog‘liq holda qaraladi. Shu jihatdan didaktik bilimlarni pedagogik loyihalash faoliyati bilan uyg‘unlashtirish bo‘lajak pedagogning kasbiy tayyorgarligining muhim tarkibiy yo‘nalishlaridan biri sifatida qaralishi mumkin.Tadqiqotda mavzuga oid ilmiy-pedagogik adabiyotlarni tahlil qilish, qiyosiy tahlil, umumlashtirish, tizimlashtirish va pedagogik jarayonni modellashtirish kabi nazariy metodlardan foydalanish maqsadga muvofiqdir. Metodologik jihatdan kompetensiyaviy va faoliyatga yo‘naltirilgan yondashuvlar didaktik-loyihalash kompetentligining mazmunini aniqlashga, tizimli yondashuv esa uning tarkibiy qismlari o‘rtasidagi o‘zaro aloqadorlikni ochib berishga xizmat qiladi.Shuningdek, kompetentlikning rivojlanish darajasini aniqlash uchun mezon, ko‘rsatkich

va diagnostik vositalarni ishlab chiqish tadqiqotning empirik bosqichini tashkil etishi mumkin. Bunda real pedagogik vaziyatlar, loyihalash topshiriqlari, mustaqil pedagogik loyihalar, refleksiv tahlil va natijalarni baholash kabi vositalardan foydalanish imkoniyati mavjud.

NATIJALAR

Tahlillar natijasida didaktik-loyihalash kompetentligini bo‘lajak pedagogning ta’lim jarayonini maqsadli tashkil etish va pedagogik loyihalarni ishlab chiqish bilan bog‘liq kasbiy kompetentligining muhim tarkibiy jihati sifatida tavsiflash mumkin.Mazkur kompetentlikning mazmunida bir nechta o‘zaro bog‘liq jihatlar ajratiladi: didaktik bilimlardan foydalanish, ta’lim maqsadlarini belgilash, ta’lim mazmunini loyihalash, metod va vositalarni tanlash, kutilayotgan natijalarni aniqlash, pedagogik faoliyatni rejalashtirish va amalga oshirilgan faoliyatni refleksiv baholash.

Shuningdek, bo‘lajak pedagoglarni kasbiy faoliyatga tayyorlash jarayonida nazariy bilimlarni amaliy loyihalash topshiriqlari bilan uyg‘unlashtirish didaktik-loyihalash kompetentligini rivojlantirishning muhim metodik imkoniyatlaridan biri sifatida aniqlandi. Tadqiqotning nazariy-metodik natijasi sifatida didaktik faoliyat va pedagogik loyihalashni alohida jarayonlar sifatida emas, balki o‘zaro bog‘liq kasbiy faoliyat komponentlari sifatida ko‘rib chiqish zarurligi asoslandi. Bunday yondashuv bo‘lajak pedagogning ta’lim jarayonini mustaqil rejalashtirish va pedagogik qarorlarni asoslash imkoniyatlarini kengaytiradi.

MUHOKAMA

Olingan nazariy tahlillar shuni ko‘rsatadiki, bo‘lajak pedagogning didaktik-loyihalash kompetentligini rivojlantirish faqat pedagogik bilimlarni ko‘paytirish bilan cheklanmaydi. Ushbu jarayon bilimlarni amaliy pedagogik faoliyatga tatbiq etish, muayyan ta’lim vaziyatlarini tahlil qilish, maqsad va natijalarni belgilash, tegishli metod va vositalarni tanlash hamda o‘z faoliyatini baholash jarayonlarini ham qamrab olishi lozim.Shu nuqtayi

nazardan, didaktik-loyihalash kompetentligining tarkibiy tuzilishini yanada aniq chegaralash muhim. Xususan, didaktik bilim, loyihalash ko‘nikmalari, amaliy faoliyat va refleksiv baholash o‘rtasidagi bog‘liqlikni mezon va ko‘rsatkichlar asosida aniqlash mazkur kompetentlikni diagnostika qilish imkonini kengaytiradi.

Metodik jihatdan esa real pedagogik vaziyatlarga asoslangan topshiriqlar, ta’lim jarayonini loyihalash, pedagogik loyihalarni mustaqil ishlab chiqish, refleksiv tahlil va natijalarni baholash mexanizmlarini o‘zaro bog‘liq holda qo‘llash maqsadga muvofiq. Bunday metodik yechimlar bo‘lajak pedagogning nazariy bilimlarini amaliy kasbiy faoliyat bilan bog‘lashga xizmat qiladi.Shu bilan birga, taklif etilayotgan metodik yondashuvlarning samaradorligini empirik jihatdan tekshirish, kompetentlikning rivojlanish darajalarini aniqlash va tegishli diagnostik vositalarni ishlab chiqish tadqiqotning keyingi bosqichlarida alohida e’tibor talab etadi.

XULOSA

Xulosa qilib aytganda, bo‘lajak pedagoglarning didaktik-loyihalash kompetentligini rivojlantirish zamonaviy pedagogik ta’limning kasbiy tayyorgarlik bilan bog‘liq muhim yo‘nalishlaridan biridir. Mazkur kompetentlik pedagogning ta’lim maqsadlarini belgilash, ta’lim mazmunini tanlash va loyihalash, metod va vositalarni asosli tanlash, kutilayotgan natijalarni aniqlash hamda pedagogik faoliyatni refleksiv baholash qobiliyatlari bilan uzviy bog‘liq.
Tadqiqot doirasidagi nazariy tahlillar kompetensiyaviy, faoliyatga yo‘naltirilgan va tizimli yondashuvlarni uyg‘unlashtirish didaktik-loyihalash kompetentligining mazmunini izchil ochib berish uchun metodologik asos bo‘la olishini ko‘rsatadi. Nazariy bilimlarni amaliy loyihalash faoliyati bilan birlashtirish esa bo‘lajak pedagoglarning kasbiy tayyorgarligini mazmunan boyitish imkonini beradi.

Shu bilan birga, mazkur yo‘nalishdagi tadqiqotlarning ilmiy-amaliy qiymatini oshirish uchun didaktik-loyihalash kompetentligining aniq mezon va ko‘rsatkichlarini ishlab chiqish, diagnostik vositalarni takomillashtirish hamda taklif etilayotgan metodik yondashuvlarni empirik tadqiqotlar orqali tekshirish muhim hisoblanadi.

FOYDALANILGAN ADABIYOTLAR

1. Shulman, L. S. Those Who Understand: Knowledge Growth in Teaching // Educational Researcher. — 1986. — Vol. 15, No. 2. — P. 4–14.

2. Ulferts, H. The Relevance of General Pedagogical Knowledge for Successful Teaching: Systematic Review and Meta-Analysis of the International Evidence from Primary to Tertiary Education. — OECD Education Working Papers, No. 212. — Paris: OECD Publishing, 2019. — DOI: 10.1787/ede8feb6-en.

3. OECD. Results from the Teacher Knowledge Survey: What Teachers Know About General Pedagogy. — Paris: OECD Publishing, 2026. — DOI: 10.1787/5542e88a-en.

4. UNESCO. UNESCO ICT Competency Framework for Teachers. Version 3. — Paris: UNESCO, 2018. — ISBN 978-92-3-100285-4.

5. Zhang, R., Liu, X., Yang, Tripp, J., Shao, B. Preservice Science Teachers’ Instructional Design Competence: Characteristics and Correlations // Eurasia Journal of Mathematics, Science and Technology Education.

6. Koh, J. H. L., Chai, C. S., Hong, H. Y., Tsai, C. C. A Survey to Examine Teachers’ Perceptions of Design Dispositions, Lesson Design Practices, and Their Relationships with Technological Pedagogical Content Knowledge (TPACK) // Asia-Pacific Journal of Teacher Education. — 2015. — Vol. 43, No. 5. — P. 378–391. — DOI: 10.1080/1359866X.2014.941280.

7. Rahayu, E. M. Fostering Critical Thinking Skills in Pre-Service Teachers: Examining Its Impact on Pedagogical Competence in Instructional Designs // Journal of Applied Linguistics and English Education. — 2026. — Vol. 3, No. 2. — P. 1–7. — DOI: 10.36456/74mgam58.

8. Odebiyi, O. M., Sunal, C. S. Lesson Design Actions: Examining Elementary Preservice Teachers’ Pedagogical Design Capability for Inquiry // Action in Teacher Education. — 2025. — Vol. 47, No. 4. — P. 367–390. — DOI: 10.1080/01626620.2025.2476968.

9. Røneid, K. N., Børte, K. Learning to Plan Lessons: How Feedback Supports Pre-Service Teachers’ Lesson Planning // Frontiers in Education. — 2026. — Vol. 11. — DOI: 10.3389/feduc.2026.1812418.

10. Baek, J., Kim, J., Lee, H., Choi, Y.-J. Development and Validation of the Pre-service Teacher Competency Scale in an Online Learning Environment Using the Scenario Method // SAGE Open. — 2025. — DOI: 10.1177/21582440251344753.

11. Van Driel, J. H. Pedagogical Content Knowledge in Teacher Education // Encyclopedia of Science Education. — Springer, 2014. — P. 1–3. — DOI: 10.1007/978-94-007-6165-0_228-5.

12. Mohamadi, Z., Malekshahi, N. Designing and Validating a Potential Formative Evaluation Inventory for Teacher Competences // Language Testing in Asia. — 2018. — Vol. 8. — Article 6. — DOI: 10.1186/s40468-018-0059-2.

13. Brownlie, N., van der Laan, L., Burke, K. Curriculum by Design: Enabling Early Career Teachers' Summative Assessment through Competence, Confidence, and Opportunity // Curriculum Perspectives. — 2026. — Vol. 46. — P. 5–22.

14. Olamova, M. U. Developing Future Educators' Digital Competence through Pedagogical Design // Web of Scientists and Scholars: Journal of Multidisciplinary Research. — 2025. — Vol. 3, No. 3. — P. 188–193.

15. König, J. et al. Teacher Competence and Professional Knowledge: International Perspectives on Teacher Education and Development.

O‘ZBEKISTONDA YENGIL VA OZIQ OVQAT SANOATINING HOLATI (1941-1950 YILLAR)

Kendjayev Yakub Yusupovich.

t.f.f.d.,(PhD)

Osiyo texnologiyalar universiteti

yakubkendjayev8@gmail.com

Annotatsiya: *Ushbu maqolada zamonaviy ta’lim jarayonida keng qo‘llanilayotgan interaktiv o‘qitish metodlarining mohiyati, turlari va ta’lim samaradorligiga ta’siribatafsil tahlil qilingan. Interaktiv metodlarning o‘quvchilarning bilimini mustahkamlash, mustaqil fikrlash va ijodiy yondashuvlarni rivojlantirishdagi roli ko‘rib chiqilgan. Shuningdek, amaliyotda bu metodlarni qo‘llashda yuzaga keladigan qiyinchiliklar va ularni bartaraf etish yo‘llari ham muhokama qilingan. Maqola ta’lim jarayonida innovatsion yondashuvlarni joriy etishga intilayotgan o‘qituvchilar va pedagogik tadqiqotchilaruchun foydali bo‘lishi mumkin.*

Abstract: *This article analyzes the types of interactive teaching methods widely used in the modern educational process and their impact on education. It examines the role of interactive methods in enhancing students' knowledge and fostering independent and creative thinking. Additionally, the article discusses practical challenges associated with implementing these methods and ways to address them. The insights regarding the introduction of innovative approaches into the educational process may prove valuable for teachers and educational researchers.*

Kalit so‘zlar: *O‘zbekiston SSR Oliy Soveti Prezidium, Chkalov, Toshtekistelmash, Qizil Tong, Namangan, viloyati.*

Keywords: *Presidium of the Supreme Soviet of the Uzbek SSR, Chkalov, Toshtekistelmash, Qizil Tong, Namangan, region.*

KIRISH

O‘zbekiston SSR Oliy Soveti Prezidiumining 1942-yil 13 fevraldagi farmoni bilan urush yillarida ishlamayotgan mehnatga layoqatli aholining, jumladan, ayollar ishtirokini ta’minlash, o‘smirlar, nafaqaxo‘rlarni safarbar qilish hisobiga ham ishchilar safi kengaytirib borildi. Ko‘chirib kekltirilgan sanoat korxonalarini qurib, ishga solishda ayniqsa yoshlar jonbozlik ko‘rsatdilar. Chunonchi, Andijon shahrida 300 ta komsamol-yoshlar brigadasi.Barqaror rivojlanish va yashirin iqtisodiyotga qarshi kurashishda sun’iy intellektning o‘rni tashkil qilinib, bular zavodlarni qurish va ishga solishda g‘ayrat bilan ishladilar. “Strommashina” zavodida ishchilarning 70 %i yoshlar edi. Ular davlat mudofaa komitetining topshiriqlarini o‘z vaqtida bajarib bordilar. Zavodda frontavik yoshlar brigadasi tuzilib, ular smena majburiyatlarini 175-250 %ga yetkazib bajarib bordilar. 380 yosh ishchilar ikki norma bajaruvchilar safida turdi6. Chkalov nomli zavodning eng yaxshi chilongari Dodamat Otamatov kunlik topshiriqni hammavaqt 300 %dan bajarib bordi7. “Toshtekistelmash” zavodining randalovchisi Daniil Ustyukov ishlab chiqarish normasini har kuni 4 hissa oshirib bajardi8. Turli joylardagi korxonlarning ishchilari 100% dan o‘tkazib vazifalarini bajarganlar quyidagilar. Toshkentdagi “Qizil Tong” tikuvchilik fabrikasining eng tajribali ishchilaridan Vinogradova, Maksimova va Husanovalar kunlik normalarini 250 %ga bajardilar. Stalin nomli zavodning ishchisi Turdi Hafizova mudofaaa mahsuloti ishlab chiqarishda SSSR miqyosida rekord o‘rnatdi. Uning brigadasidagi yosh ishchi Yusupova bir smenada rejaga muofiq 330 ta tayoqni bo‘yashi lozim bo‘lgani holda, 2100 ta tayoqni bo‘yab, bu sohada qo‘yilgan Ittifoq rekordini yangiladi9. Stalin nomidagi Toshkent to‘qimachilik kombinatining ishchisi Habiba Isroilova to‘rt qator mashinada ishlab, kunlik rejani 150 %ga bajardi. Kombinatning eng yaxshi tikuvchisi Faina Petrishcheva o‘nta dastgohga qarab kunlik ishlab chiqarish togpshiriqlarini 200-250 %ga bajarib bordi10. Samaqanddagi avtoremont

korxonasining ishchilari “o‘zimizni Vatanni himoya etishga safarbar qilingan deb hisoblaymiz!” degan majburiyatni olib, umuman, korxonada mehnat unumdorligini 20 %dan oshirib bajardilar. Samarqand paxta zavodi jamoasi mehnat unumdorligini 15 %ga oshirib, ishlab chiqarilayotgan mahsulot tannnarxini ancha kamaytirishga erishdilar11. Yoshlar bir necha ixtisosliklarni egallab, har qanday topshiriqni o‘z vaqtida bajarib bordilar. Bunday yoshlar zavodda 500 dan oshiq edi. Masalan, Sergeyeva boshchiligidagi yoshlar brigadasi mehnat unumdorligini 212 dan 450 %gacha ko‘tardilar. Mamadaliyev boshchiligidagi brigada esa 180 dan 400 %ga qadar ko‘tardi12. Yoshlar brigadasining a’zosi Sergeyeva zavodga 1942-yili shogird bo‘lib kirgan edi. U qichqa vaqt ichida shlifovshchik ixtisosini egallab, yoshlardan 20 kishini o‘ziga shogird qilib.Barqaror rivojlanish va yashirin iqtisodiyotga qarshi kurashishda sun’iy intellektning o‘rni 1354 olib, yoshlar brigadasini tuzdi. Bu brigada rejani 600%gacha oshirib bajardi. Sergeyeva o‘zining fidokorona mehnati evaziga “Qizil bayroq” ordeni bilan taqdirlangan edi13. Nurxon Zuhriddinova ham zavodga shogird bo‘lib kirgan edi. U qisqa muddat ichida frezerovshchik ixtisosini egallab,mehnatda o‘rnak ko‘rsatdi. Bunday yosh qizlar zavodda ancha kishini tashkil qilar edi. 1944-yil fidokorona mehnatlari uchun zavod yosh ishchilaridan 17 kishi sovet davlatining turli ordenlari bilan mukofatlandi. 14 kishi O‘zbekiston SSR Oliy Soveti Prezidumining faxry yorlig‘i bilan taqdirlangandi14. Sanoat ishlab chiqarilishiga xotin-qizlar, voyaga yetmagan yoshlar ayniqsa faol jalb qilib borildi. Agar 1940-yil sanoatda mehnat qiluvchilar orasida xotin-qizlarning ulishi 34,0 %ni tashkil qilgan bo‘lsa, 1942-yilga kelib bu ko‘rsatkich 63,5%ga qadar o‘sib borganini statistik ma’lumotlar tasdiqlab turibdi15. Darhaqiqat frontga ketgan erkaklarning ish o‘rinlari ayollar hisobiga to‘ldirib borildi. Natijada ishlab chiqarish korxonalariga ayollar oqimi ko‘paydi. Masalan, 1941-yilning ikkinchi yarmida Namangan viloyatidagi korxonalarda 230 nafar ayol turli kasblarni o‘rganib, ulardan 28

nafari slesar, 18 nafari tokar, 18 nafari elektromantyor, 25 nafari shofyor va boshqa “erkaklar kasbi”ni o‘zlashtirdilar.

Aloqa yo‘llari xalq komissariyaatining 1941 yil oktabrdagi “Xotin-qizlar orasida temir yo‘l mutaxassislarini tayyorlash va mehnat ko‘nikmalarini oshirish to‘g‘risida”gi farmoyishi ijrosi sifatida 1942-yil oxiriga kelib O‘zbekiston temir yo‘llarida 8 599 nafar ayol ishlagan. Birgina Samarqand temir yo‘l stansiyalari va agregatlarida 1942-yil boshlarida 127 nafar xotin qiz xizmat qilib, shulardan 20 tasi slesar, 10 tasi mashinist yordamchisi, 3 tasi poyezd o‘t yoquvchisi (kochegar) vazifasini bajargan17. Ikkinchi jahon urushi yillarida, hatto shaxtyorlik kasbiga ham ayollar jalb qilindi. Umuman olganda, bu davrda O‘zbekiston ishlab chiqarish sanoatida ayollar hal qiluvchi kuchga aylandi. Albatta, bunday tadbirlar yuqori partiya organlarining qat’iy siquvi zo‘ravonlikka asoslangan majburlashlari tufayli amalga oshirilganligini aytish joiz. O‘zbekiston iqtisodiyotining katta qismi qishloq xo‘jaligiga qaratilganligini inobatga olsak, hukumatning asosiy e’tibori mexanizator kadrlarni tez sur’atlarda ayollardan tayyorlashga qaratildi. O‘zbekiston bo‘ylab “Xotin-qizlar traktor ruliga o‘tiring!” harbiy xitobnomasi yoyildi. Matbuotda uy bekalarining mexanizatorlarga aylanayotganligi18, qizlarning traktorchilar kursini muvaffaqiyatli tugatayotganliklari19 haqida “to‘lib-toshib” yozildi.

Barqaror rivojlanish va yashirin iqtisodiyotga qarshi kurashishda sun’iy intellektning o‘rni 1941-yil avgust-sentabr oylarida O‘zbekistondagi MTS (mashina traktor stansiyalari) va mexanizatorlar maktablari qoshida ochilgan traktorchilar tayorlovchi qisqa kursar tinglovchilarining 80 %ini xotin-qizlar tashkil etgan20. Masalan, 1941-yilda bu kurslarni 18765 kishi tamomlagan bo‘lsa, shulardan 12428 tasi ayollar edi21. Birgina Samarqand viloyatidagi mexanizatorlar tayyorovchi mazkur kurslarni 1943-yilda 3,9 ming tinglovchi bitirgan bo‘lib, ularning 85 %i ayollardan iborat bo‘lgan22. Urushning so‘ngi yillarida ham xotin-qizlarning sanoat ishlab chiqarishi va

transport sohasidagi soni oshib bordi. Agar, 1940-yilda paxta tozalash sanoatida xotin-qizlarni jalb etish 30 %dan oshmagan bo‘lsa, 1945-yilda bu ko‘rsatkich 70 %ni tashkil etdi.

Oziq-ovqat sanoatida ayollar miqdori 43 %dan 62 %ga o‘sdi, temir yo‘l transportidagi xizmatda ayollar soni 17 %ga ortib, 3 barobarga ko‘paydi, parovoz o‘t yoquvchilari 26 %ga, parovoz ta’miri slesarlari 39 %ga oshdi23. Ishchilarda yetarli malaka va texnikaning yetishmasligi sababli hamma korxonalar ham harbiy mahsulotlarni ishlab chiqarishni eplay olmadilar. Masalan, SSSR Yer ishlari xalq komisarligining harbiy mahsulot ishlab chiqarishga mo‘ljallangan 30 ta korxonasidan 21 tasi zarur asbob-uskunalar bilan ta’minlanmagan edi. 24. O‘zbekistonda ham barcha korxonalar ishlab chiqarishni muvafaqiyatli harbiy izga o‘tkaza olmadi, ba’zi korxonalar esa harbiy mahsulotlar ishlab chiqarishni yo‘lga qo‘ymadilar. Rejalar noto‘g‘ri tuzilganligi va texnikadan samarasiz foydalanish oqibatida Markazga qarashli xalq komissarliklariga tegishli korxonalar harbiy ishlab chiqarish rejalarini iyulda 66,9 %, avgustda 31,8 %, sentabrda esa 50 % darajasida bajardi.25. Rejalarning bajarilmasligiga ishchi kuchining, ayniqsa, malakali kadrlar va ishlab chiqarish vositalarining yetishmasligi katta ta’sir o‘tkazdi. Frontga ketganlarning o‘rnini egallagan malakassiz ishchilarga yangi texnikani egallash uchun vaqt zarur edi. Ishchilar malakasining oshishi, korxonalar texnika va texnologiyalarining harbiy mahsulotlar ishlab chiqarishga moslashishi bilan vaziyat yaxshilana boshladi. 1941-yil oktabrda respublika korxonalarida ishlab chiqarilgan mahsulotlarining 51 % harbiy byurtmalar asosida ishlab chiqarildi. 1941-yil noyabr oyida Toshkent shahrida faoliyat yuritayotgan 137 ta korxonadan 63 tasi to‘liq yoki qisman harbiy mahsulot ishlab chiqarishga o‘tdi. Biroq ishchi kuchining yetishmasligi tobora sezilib bordi. Idora xizmatchilari, uy bekalari, o‘quvchilar ishlab chiqarishga jalb qilindi. 1941-yil 14-dekabrdan harbiy .Barqaror rivojlanish va yashirin iqtisodiyotga qarshi kurashishda sun’iy

intellektning o‘rni 1356 korxonalar xodimlari urushga safarbar qilinganlar maqomiga ega bo‘lgan va shu korxonalarga biriktirildi. Mehnat intizomini buzganlar uchun jazo choralari keskin qo‘yildi. Korxonalardan o‘zboshimchalik bilan ketib qolganlar 5 yildan 8 yilgacha muddat bilan qamoqqa hukm qilinardi. Biroq odamlar urush yillarida mamlakat ichkarisida, shu jumladan O‘zbekistonda “yuqoridan” ortiqcha qistovsiz fidokorona mehnat qildilar. O‘zbekiston SSRda ishchilar sinfining keskin ortib borishi, yana yosh bolalar, yaniy voyaga yetmaganlar hisobiga ham amalga oshirildi.

Yoshlardan ishchi kadrlarni tayorlashda mehnat rezervlari tizimi salmoqli rol o‘ynamog‘i lozim bo‘lgan edi. Shu maqsadlardan kelib chiqib 1942-yil oxirlariga kelib yana qo‘shimcha ravishda 31 ta FZT (fabrika-zavod ta’limi) maktablari ochilgan edi, ularda ta’lim oluvchi 15320 o‘quvchidan iborat bo‘lib, 15 yoshdan 18 yoshgacha bo‘lgan yoshlar edi29. 1943-yil oxirida respublikada 25 ta FZT maktabi, 10 ta hunar va 4 ta temir yo‘l o‘quv yurtlari mavjud bo‘lib, ularda ta’lim olgan yigit-qizlar soni 57 mingni tashkil etdi30. Bularning barchasi respublikaning mehnat zahirasi bo‘lib malaka hosil qilgan yosh ichilar sanoat korxonalari jamolariga borib qo‘shilib, o‘z bilimlarini ilg‘or ishchilar tajribalari bilan boyitib bordilar. Binobarin, ularning mehnati ishlab chiqarilayotgan mahsulotlarning yuqori sifatida ham o‘z aksini topib, natijalarini bergan edi. 1944-yilga kelib esa respublikada jami 14 ta kasb-hunar maktabi va 45 ta FZT maktabi ishlab turdi. Ularda ta’lim berish jadallashgan dastur bo‘yicha olib borildi. Urushning dastlabki kunlaridanoq ishchi xodimlarni qisqa muddatli kurslarda ommaviy ravishda tayyorlash, yakka tartibda va brigada shogirdligi usullari bilan tayyorlash, ayniqsa, keng quloch yoydi. Urush davrining 17 oyi ichida yoshlardan (14-17 yoshlilar) ommaviy kasblar bo‘yicha 23300 nafar ishchi kuchlari maxsus maktablarda tayyorlanib respublika sanoatiga ishchi kuchi sifatida yetkazib berildi. Masalan, 1945-yilda Chirchiqdagi fabrika-zavod ta’limi maktabi

qurilishlarda ishlaydigan 360 dan ortiq har xil kasbdagi malakali ishchilar tayyorlab chiqarildi. Bu ta'lim maskanini g'ishtchilar, suvoqchilar, duradgorlar, slesarlar, mexaniklar kabi kasb-kor egalari bitirib chiqdilar va xalq xo'jaligiga yo'naltirildilar.

XULOSA

Xulosa qilib aytganda, Ikkinchi jahon urushi yillarida O'zbekistonda sanoat va transport sohalarida xotin-qizlar hamda yoshlarning mehnatdagi ishtiroki keskin oshdi. Erkaklarning frontga ketishi natijasida ayollar turli kasblarni egallab, ishlab chiqarishning muhim kuchiga aylandilar. Ayniqsa, sanoat, temir yo'l va qishloq xo'jaligida ayollarning faol mehnati mamlakat iqtisodiyotini saqlab qolishda muhim ahamiyat kasb etdi. Biroq bu jarayon yuqori partiya organlarining majburlov siyosati va malakali ishchi kuchi hamda texnika yetishmovchiligi bilan kechgan.

FOYDALANILGAN ADABIYOTLAR.

1. Ўзбекистон Миллий архиви (Ўз МА), 90-фонд, 8-рўйғат, 5937-иш, 7-варақ.
2. Ўз МА, 90-фонд, 8-рўйғат, 6118-иш, 20-24-варақлар.
3. Узбекская ССР в годы Великой Отечественной войны. (1941-1945-гг.)Том 3. –Ташкент: Фан, 1985. –С.89.
4. Верт А. России в войне 1941-1945-. Авторизованный перевод с английского. –Москва: Воениздать, 1967.. –С. 149.
5. Узбекская ССР в годы Великой Отечественной войны. (1941-1945-гг.)Том 1. –С. 110.
6. Голованов А.А. , Саидов И.М. Вклад Узбекистана в победу над фашизмом. –Самарканд: Изд. СамГУ, 2006. Часть II. С. 6.

BOSHLANG‘ICH SINFLARDA BADIIY ASARLARNI O‘RGATISHNING PEDAGOGIK-PSIXOLOGIK ASOSLARI

Axmedova Mahliyo Ruziboy qizi

Samarqand davlat pedagogika instituti tadqiqotchisi

Annotatsiya. *Boshlang‘ich sinflarda badiiy asarlarni o‘rgatish bolalarning intellektual, emotsional, lingvistik va ijtimoiy rivojlanishining muhim tarkibiy qismlaridan biridir. Badiiy matnlar yosh o‘quvchilarga nafaqat o‘qish ko‘nikmalarini rivojlantirish, balki insoniy munosabatlarni anglash, axloqiy qadriyatlarni tushunish, tasavvurni rivojlantirish va shaxsiy munosabatini ifodalash imkonini beradi. Shu sababli badiiy asarlarni samarali o‘rgatish bolalarning yoshga xos kognitiv va emotsional xususiyatlariga mos pedagogik hamda psixologik tamoyillarni integratsiyalashni talab qiladi. Mazkur maqolada boshlang‘ich ta’limda badiiy asarlarni o‘rgatishning pedagogik va psixologik asoslari o‘rganilib, o‘qishga motivatsiya, matnni tushunish, emotsional jalb etilish, tasavvur, dialog, narrativni anglash va o‘quvchiga yo‘naltirilgan ta’lim yondashuvlariga alohida e’tibor qaratiladi. Tadqiqotda o‘qishga bo‘lgan motivatsiya, o‘qib tushunish, dialogik o‘qish va badiiy-narrativ matnlarni anglash bo‘yicha zamonaviy tadqiqotlar umumlashtirilib, boshlang‘ich sinflarda adabiy ta’limni tashkil etishning pedagogik jihatdan asoslangan yondashuvi taklif etiladi. Tahlil natijalari shuni ko‘rsatadiki, badiiy asarlarni o‘rgatish o‘quvchilar matnni talqin qilish, bashorat qilish, savol berish, munozara yuritish, emotsional munosabat bildirish va matnni ijodiy qayta yaratish jarayonlariga faol jalb etilganda samaraliroq bo‘ladi. Shuningdek, o‘qituvchining roli ham muhim bo‘lib, u faqat matn mazmunini yetkazib beruvchi emas, balki interaktiv ta’lim muhitini tashkil etuvchi fasilitator sifatida faoliyat yuritishi lozim. Maqola yakunida psixologik jihatdan asoslangan va pedagogik jihatdan muvozanatli adabiy ta’lim boshlang‘ich sinf o‘quvchilarida o‘qish savodxonligi, tanqidiy va ijodiy fikrlash, emotsional ong hamda mutolaa qilishga barqaror motivatsiyani rivojlantirishga xizmat qilishi asoslanadi.*

Kalit so‘zlar: *boshlang‘ich ta’lim, badiiy asarlar, adabiy ta’lim, o‘qib tushunish, o‘qishga motivatsiya, bola psixologiyasi, narrativni anglash, dialogik o‘qish, o‘qish savodxonligi, pedagogik asoslar.*

KIRISH

Adabiy ta’lim boshlang‘ich maktabda muhim o‘rin tutadi, chunki formal ta’limning dastlabki yillari bolalarda o‘qish odatlari, til kompetensiyasi, tasavvur, emotsional ong va ta’limga bo‘lgan munosabat shakllanadigan muhim davr hisoblanadi. Mazkur bosqichda badiiy asarlarni o‘qitish faqat so‘zlarni to‘g‘ri talaffuz qilish yoki matn mazmunini qayta bayon etish bilan cheklanmasligi kerak. Adabiyotning ta’limiy imkoniyati o‘quvchilar qahramonlarni tushunish, voqealarni talqin qilish, harakat va oqibatlar o‘rtasidagi bog‘liqlikni aniqlash, emotsional munosabat bildirish, bashorat qilish va matn mazmunini o‘z hayotiy tajribasi bilan bog‘lashga undalgandagina to‘liq namoyon bo‘ladi. Shu sababli badiiy asarlarni o‘rgatish til, kognitiv, emotsional, ijtimoiy va madaniy rivojlanishni o‘zida birlashtiruvchi ko‘p qirrali pedagogik jarayon sifatida qaralishi lozim.

Boshlang‘ich sinf o‘quvchilarining psixologik xususiyatlari badiiy matnlarni ayniqsa muhim ta’limiy resursga aylantiradi. Mazkur yosh davrida o‘quvchilar axborotni tizimlashtirish, munosabatlarni aniqlash, tushuntirishlar yaratish va o‘z qarashlaridan farqli bo‘lgan nuqtayi nazarlarni tushunish qobiliyatlarini bosqichma-bosqich rivojlantiradilar. Badiiy hikoyalar ushbu jarayonlarni qo‘llab-quvvatlashi mumkin, chunki hikoya tarkibida vaqt ketma-ketligi, qahramonlar, nizolar, maqsadlar, oqibatlar va emotsional kechinmalar mavjud bo‘lib, o‘quvchilar ularni tahlil qilishi va talqin qilishi mumkin.

Badiiy matn o‘qish jarayonida nafaqat bilim olish obyekti, balki kognitiv va emotsional o‘zaro ta’sir muhiti sifatida ham namoyon bo‘ladi. Bola badiiy asar mazmunini shunchaki o‘qituvchidan tayyor holda qabul qilmaydi. Aksincha, mazmun matn, o‘quvchining avvalgi bilimlari, shaxsiy tajribasi va sinfdagi muhokamalar o‘rtasidagi o‘zaro ta’sir jarayonida shakllanadi.

Zamonaviy tadqiqotlar o‘qib tushunishni o‘quvchilarning o‘qishga bo‘lgan motivatsiyasidan ajratib bo‘lmasligini ko‘rsatadi. 39 ta intervensiya tadqiqotini qamrab olgan meta-tahlilda nazariy jihatdan asoslangan yondashuvlarning o‘qishga motivatsiya va o‘qib tushunishga ijobiy ta’siri aniqlangan. Ayniqsa, o‘quvchilarning qiziqishini oshirishga qaratilgan intervensiyalar ijobiy natijalarni ko‘rsatgan. Boshlang‘ich sinf o‘quvchilarida o‘qib tushunishga ta’sir ham yuqori sinf o‘quvchilariga nisbatan kuchliroq bo‘lgan. Shu sababli badiiy ta’limda hikoya, qahramonlar, nizolar va emotsional vaziyatlarga qiziqish o‘quvchilarning matn bilan faol ishlashini ta’minlovchi muhim mexanizm sifatida qaralishi mumkin.

Badiiy ta’limning nazariy va psixologik asoslari

Badiiy asarlarni o‘rgatishning psixologik asosi boshlang‘ich sinf o‘quvchilarining rivojlanish xususiyatlari bilan chambarchas bog‘liq. Ushbu yosh davrida o‘quvchilar axborotni tashkil etish, munosabatlarni aniqlash, sabablarni tushuntirish va boshqa insonlarning nuqtayi nazarini anglash kabi murakkab kognitiv qobiliyatlarni rivojlantira boshlaydilar. Badiiy hikoyalar mazkur jarayonlarni qo‘llab-quvvatlash uchun qulay sharoit yaratadi.

Badiiy ta’lim jarayonidagi asosiy psixologik mexanizmlardan biri mazmunni konstruksiya qilishdir. Bola badiiy matn mazmunini o‘qituvchidan tayyor holda qabul qilmaydi. U mazmunni o‘zining avvalgi bilimlari, hayotiy tajribasi, matn va sinfdagi muloqot asosida shakllantiradi. Shu sababli bir xil badiiy asarni o‘qigan ikki o‘quvchining munosabati turlicha bo‘lishi mumkin. Chunki ularning tajribasi, kutishlari va emotsional assotsiatsiyalari bir-biridan farq qiladi.

Shu nuqtayi nazardan, o‘qitish jarayonida turli talqinlar uchun imkoniyat yaratish, biroq ushbu talqinlarni matndagi dalillar bilan asoslashga o‘rgatish muhimdir. Bunday yondashuv o‘quvchilarda mustaqil fikrlash va matn asosida xulosa chiqarish qobiliyatini rivojlantiradi.

Boshlang‘ich ta’limda narrativni, ya’ni hikoya mazmunini anglash ham alohida ahamiyatga ega. Tadqiqotlar birinchi sinf o‘quvchilariga hikoya elementlari va ular o‘rtasidagi munosabatlarni bevosita o‘rgatish narrativ mazmunni tushunish, muhim voqealarni eslab qolish, xulosa chiqarish hamda hikoyadagi psixologik jihatlarni anglashga ijobiy ta’sir ko‘rsatishini ko‘rsatadi.

Badiiy o‘qishning yana bir muhim psixologik jihati emotsional jalb etilishdir. Badiiy qahramonlar va vaziyatlar o‘quvchilarga turli his-tuyg‘ularni anglash, harakatlarning oqibatlarini tushunish va boshqa insonlarning nuqtayi nazarini ko‘rib chiqish imkonini beradi. O‘qituvchi “Nima uchun qahramon bunday harakat qildi?”, “Ushbu vaziyatda boshqa qahramon o‘zini qanday his qilgan bo‘lishi mumkin?”, “Agar voqea boshqacha rivojlanganida nima sodir bo‘lardi?” kabi savollar orqali o‘quvchilarni oddiy mazmunni anglashdan yuqoriroq darajadagi talqin va ijtimoiy-emotsional fikrlashga olib borishi mumkin.

Badiiy asarlarni o‘rgatishning pedagogik tamoyillari

Badiiy ta’limni tashkil etish o‘quvchining faol ishtirok etishi tamoyiliga asoslanishi lozim. O‘qituvchi butun matn mazmunini tushuntirib, o‘quvchilardan ushbu izohni qayta aytib berishni talab qiladigan an’anaviy yondashuv mustaqil talqin qilish uchun cheklangan imkoniyat yaratadi. O‘quvchiga yo‘naltirilgan yondashuvda esa o‘quvchi faol kitobxon sifatida namoyon bo‘lib, savollar beradi, bashorat qiladi, qahramonlarni tahlil qiladi, voqealarni muhokama qiladi va o‘z javoblarini asoslaydi.

Ayniqsa, dialogik o‘qish boshlang‘ich ta’limda samarali metodik yondashuvlardan biri hisoblanadi. Dialogik o‘qishda o‘qituvchi va o‘quvchilar matn mazmunini muntazam muloqot va muhokama orqali birgalikda shakllantiradilar. 64 ta tadqiqot va 10 463 nafar bolani qamrab olgan zamonaviy meta-tahlil dialogik o‘qishning dekodlash, o‘qib tushunish

va matnga munosabat kabi o‘qish savodxonligining turli yo‘nalishlariga ijobiy ta’sir ko‘rsatishini aniqlagan.

Bunday jarayonda o‘qituvchi tomonidan beriladigan savollar muhim ahamiyatga ega. Savollar oddiy faktlarni aniqlashdan boshlab, bosqichma-bosqich xulosa chiqarish, baholash va talqin qilish darajasiga ko‘tarilishi kerak. Dastlab o‘quvchilardan qahramonlar, joylar va voqealarni aniqlash so‘ralishi mumkin. Keyinchalik ular qahramonlarning motivlarini tushuntirish, sabab va oqibatlarni aniqlash, voqealarning keyingi rivojini bashorat qilish va qahramonlarning qarorlarini baholashga jalb qilinadi.

Badiiy asarlarni o‘qitishda o‘qishdan oldingi, o‘qish jarayonidagi va o‘qishdan keyingi faoliyatlarni o‘zaro bog‘lash ham muhimdir. O‘qishdan oldin o‘qituvchi o‘quvchilarning avvalgi bilimlarini faollashtirishi, sarlavha yoki rasmlar asosida savollar berishi va voqealar rivoji haqida bashorat qildirish mumkin. O‘qish jarayonida esa muhim voqealar, notanish tushunchalar, qahramonlarning xatti-harakatlari va emotsional o‘zgarishlariga e’tibor qaratiladi. O‘qishdan so‘ng o‘quvchilar voqealar ketma-ketligini tiklash, asosiy g‘oyani aniqlash, turli talqinlarni muhokama qilish yoki asar mazmunini hayotiy vaziyatlar bilan bog‘lashlari mumkin.

Badiiy asarlarning tafakkurni rivojlantirishdagi o‘rni

Badiiy asarlar boshlang‘ich sinf o‘quvchilarida yuqori darajadagi tafakkur ko‘nikmalarini rivojlantirish uchun samarali vosita bo‘lishi mumkin. Mazmunli hikoya o‘quvchilar oldiga muayyan muammo qo‘yadi va ularni sabablarni aniqlash, munosabatlarni tahlil qilish, xulosa chiqarish, muqobil variantlarni taqqoslash va oqibatlarni baholashga undaydi.

Masalan, qahramon murakkab qaror qabul qiladigan hikoyani o‘qib bo‘lgach, o‘quvchilardan muammoni aniqlash, mavjud variantlarni tushuntirish, har bir qarorning mumkin bo‘lgan oqibatlarini bashorat qilish va qahramonning yakuniy qarorini baholash so‘ralishi mumkin. Bunday

topshiriqlar o‘quvchilarga matnda bevosita berilgan ma’lumotlar bilan mustaqil xulosa asosida olinadigan ma’lumotlarni farqlashni o‘rgatadi.

Ijodiy topshiriqlar ham ushbu jarayonni yanada kuchaytiradi. O‘quvchilarga voqeani boshqa qahramon nuqtayi nazaridan qayta yozish, muqobil yakun yaratish, qahramonlar o‘rtasida dialog tuzish, voqealar ketma-ketligini rasm orqali ifodalash yoki hikoyani sahnalashtirish topshirilishi mumkin. Bunday faoliyatlar o‘quvchilardan ma’lumotni shunchaki takrorlash emas, balki uni qayta tashkil etish va ijodiy qayta ishlashni talab qiladi.

Badiiy asarlarni o‘rgatishda o‘qituvchi va o‘quvchi o‘rtasidagi o‘zaro ta’sir

O‘qituvchi badiiy o‘qishni faol intellektual va emotsional jarayonga aylantiruvchi ta’lim muhitini yaratishda markaziy o‘rin tutadi. Biroq o‘qituvchining vazifasi badiiy asarning yagona “to‘g‘ri” mazmunini tushuntirish bilan chegaralanmasligi kerak. U o‘quvchilarni mustaqil talqin qilish va matndagi dalillar asosida fikr yuritishga yo‘naltiruvchi fasilitator sifatida faoliyat yuritishi lozim.

Samarali o‘qituvchi bolalarda turli talqinlarni erkin ifodalash uchun qulay muhit yaratadi. Shu bilan birga, o‘quvchilar o‘z fikrlarini matnning tegishli qismlari bilan asoslashga bosqichma-bosqich o‘rgatiladi. “Nima uchun shunday deb o‘ylaysiz?”, “Matnning qaysi qismi sizning fikringizni tasdiqlaydi?”, “Qahramon boshqacha yo‘l tutishi mumkinmidi?” kabi savollar o‘quvchilarning fikrlash jarayonini tushuntirishga yordam beradi.

O‘qituvchining teskari aloqasi ham muhim psixologik vazifani bajaradi. Teskari aloqa faqat javobning to‘g‘ri yoki noto‘g‘riligini ko‘rsatish bilan cheklanmasligi kerak. U o‘quvchiga qanday xulosaga kelganini tushunish va o‘z fikrlash jarayonini takomillashtirish imkonini berishi kerak.

O‘qishga motivatsiya va badiiy asarlarni tanlash

Badiiy asarlarni tanlash muvaffaqiyatli ta’limning eng muhim metodik shartlaridan biridir. Matnlar o‘quvchilarning yoshi, o‘qish qobiliyati, emotsional rivojlanishi, til kompetensiyasi va qiziqishlariga mos bo‘lishi kerak. Shu bilan birga, o‘quvchilarni fikrlashga va izlanishga undaydigan darajada intellektual qiyinchilikni ham ta’minlashi lozim.

Matn tanlash va o‘qishga motivatsiya o‘rtasidagi munosabat alohida ahamiyatga ega. Tadqiqotlar o‘quvchilarning qiziqishini oshirishga yo‘naltirilgan metodik aralashuvlar o‘qishga bo‘lgan motivatsiya va o‘qib tushunishni yaxshilashi mumkinligini ko‘rsatadi. Shu sababli o‘qituvchi badiiy asarni tanlashda nafaqat uning adabiy va tarbiyaviy qiymatini, balki bolalarda qiziqish, savol, emotsional munosabat va munozara uyg‘otish imkoniyatini ham hisobga olishi kerak.

Badiiy asarlarning xilma-xilligi ham muhimdir. O‘quvchilar turli xarakterdagi qahramonlar, voqealar, hayotiy vaziyatlar, madaniy kontekstlar va ijtimoiy munosabatlarni aks ettiruvchi asarlar bilan tanishishlari kerak. Bu ularning dunyoqarashini kengaytirishga va insonlar o‘rtasidagi o‘xshashlik hamda farqlarni anglashiga yordam beradi.

Badiiy asarlarni o‘rgatishning metodik modeli

Yuqoridagi pedagogik va psixologik jihatlarga asoslangan holda boshlang‘ich sinflarda badiiy asarlarni o‘rgatishni besh bosqich asosida tashkil etish mumkin: **motivatsion tayyorgarlik, mazmunli o‘qish, dialogik talqin, ijodiy qayta yaratish va reflektiv baholash**.

Birinchi bosqichda o‘qituvchi o‘quvchilarda bo‘lajak matnga qiziqish uyg‘otadi. Buning uchun asar sarlavhasi, rasmlar, qahramonlar yoki asosiy muammo asosida savollar berish mumkin. Maqsad o‘quvchilarning avvalgi bilimlarini faollashtirish va matnni o‘qishga ichki tayyorgarlik hosil qilishdan iborat.

Ikkinchi bosqichda o‘quvchilar bevosita badiiy matn bilan ishlaydilar. O‘quvchilarning yosh va o‘qish darajasiga qarab matn mustaqil, ovoz

chiqarib, ichda yoki hamkorlikda o‘qilishi mumkin. O‘qish jarayonida o‘qituvchi muhim voqealar, qahramonlarning xatti-harakatlari va voqealar rivojiga e’tibor qaratadi.

Uchinchi bosqichda dialogik talqin amalga oshiriladi. O‘quvchilar qahramonlar, ularning motivlari, nizolar, emotsiyalar va voqealar oqibatlarini muhokama qiladilar. O‘qituvchi savollarning kognitiv murakkabligini bosqichma-bosqich oshirib boradi.

To‘rtinchi bosqichda o‘quvchilar badiiy materialni ijodiy qayta yaratadilar. Ular asar yakunini o‘zgartirishlari, voqeani boshqa qahramon nomidan hikoya qilishlari, sahnani rollarga bo‘lib ijro etishlari, qahramon portretini yaratishlari yoki hikoyani davom ettirishlari mumkin.

Beshinchi bosqichda refleksiya amalga oshiriladi. O‘quvchilar asardan nimani o‘rganganliklarini, qahramonlar haqida qanday xulosaga kelganliklarini, dastlabki taxminlari qanday o‘zgarganini yoki hikoyadagi vaziyatni o‘z hayotlari bilan qanday bog‘lashlarini izohlashlari mumkin. Refleksiya o‘quvchilarning matnni tushunishini mustahkamlaydi va o‘z o‘qish jarayonini anglashiga yordam beradi.

Muhokama

Tahlil natijalari boshlang‘ich sinflarda badiiy asarlarni samarali o‘rgatish yagona metodga emas, balki pedagogik va psixologik tamoyillarning integratsiyasiga asoslanishi kerakligini ko‘rsatadi. O‘qishga motivatsiya, matnni tushunish, emotsional jalb etilish, narrativni anglash, dialog va ijodiy munosabat badiiy ta’limning o‘zaro bog‘liq komponentlari sifatida qaralishi lozim.

Mavjud tadqiqotlar ushbu integratsiyalashgan yondashuvni qo‘llab-quvvatlaydi. O‘qishga bo‘lgan motivatsiya o‘qish natijalari bilan bog‘liq bo‘lib, qiziqishni oshirishga yo‘naltirilgan metodik aralashuvlar motivatsiya va o‘qib tushunishni yaxshilashi mumkin. Dialogik o‘qish ham

o‘quvchilarning o‘qish savodxonligiga, ayniqsa, matnni tushunish va unga munosabat bildirish qobiliyatlariga ijobiy ta’sir ko‘rsatadi.

Mazkur natijalar badiiy ta’limni faqat o‘qish va mazmunni qayta aytib berish jarayoni sifatida talqin qilishdan voz kechish zarurligini ko‘rsatadi. Boshlang‘ich sinflarda badiiy ta’lim o‘quvchi, matn, avvalgi bilim, shaxsiy tajriba va ijtimoiy muloqot o‘rtasidagi o‘zaro ta’sir asosida mazmun yaratish jarayoni sifatida tashkil etilishi kerak.

Shuningdek, o‘qituvchilarning metodik tayyorgarligi ham alohida ahamiyatga ega. O‘qituvchi badiiy asarlarni to‘g‘ri tanlay olishi, kognitiv jihatdan bosqichma-bosqich murakkablashuvchi savollar tuzishi, sinfdagi dialogni boshqarishi, konstruktiv teskari aloqa berishi va o‘quvchilarning yosh xususiyatlariga mos ijodiy topshiriqlar ishlab chiqishi lozim.

XULOSA

Boshlang‘ich sinflarda badiiy asarlarni o‘rgatish faqat o‘qish ko‘nikmalarini shakllantirishga qaratilgan jarayon emas, balki bolalarning kognitiv, emotsional, kommunikativ, ijodiy va axloqiy rivojlanishini ta’minlovchi murakkab pedagogik-psixologik jarayondir. Badiiy matnlar o‘quvchilarga turli qahramonlar, nizolar, emotsiyalar, hayotiy vaziyatlar va ijtimoiy munosabatlar bilan tanishish imkonini berib, bir vaqtning o‘zida til va o‘qib tushunish kompetensiyalarini rivojlantiradi.

Tahlil natijalari samarali badiiy ta’lim o‘qishga motivatsiya, narrativni anglash, dialogik muloqot, emotsional jalb etilish, ijodiy qayta yaratish va reflektiv faoliyatni integratsiyalashi kerakligini ko‘rsatadi. O‘qituvchi badiiy asarning yagona “to‘g‘ri” talqinini yetkazuvchi emas, balki o‘quvchilarni mustaqil fikrlash, matn asosida xulosa chiqarish va turli nuqtayi nazarlarni muhokama qilishga yo‘naltiruvchi fasilitator sifatida faoliyat yuritishi lozim.

Taklif etilgan **motivatsion tayyorgarlik → mazmunli o‘qish → dialogik talqin → ijodiy qayta yaratish → reflektiv baholash** modeli boshlang‘ich sinflarda badiiy asarlarni o‘rgatishni tizimli tashkil etish uchun

amaliy-metodik asos bo‘lib xizmat qilishi mumkin. Kelgusidagi empirik tadqiqotlarda ushbu modelning turli yosh guruhlari, badiiy janrlar va ta’lim sharoitlarida samaradorligini aniqlash, shuningdek, uning o‘quvchilarning o‘qishga motivatsiyasi, o‘qib tushunishi, ijodiy fikrlashi va uzoq muddatli mutolaa qiziqishiga ta’sirini o‘rganish maqsadga muvofiqdir.

REFERENCES

1. Baumann, J. F., & Bergeron, B. S. (1993). Story map instruction using children’s literature: Effects on first graders’ comprehension of central narrative elements. *Reading Research and Instruction, 33*(1), 1–18. https://doi.org/10.1080/10862969309547828

2. Hall, C., Capin, P., Vaughn, S., Gillam, S. L., Wada, R., Fall, A.-M., Roberts, G., Dille, J. T., & Gillam, R. B. (2021). Narrative instruction in elementary classrooms: An observation study. *The Elementary School Journal, 121*(3), 417–441. https://doi.org/10.1086/712416

3. Paris, A. H., & Paris, S. G. (2007). Teaching narrative comprehension strategies to first graders. *Cognition and Instruction, 25*(1), 1–44. https://doi.org/10.1080/07370000709336701

4. Merke, S., Ganushchak, L., & van Steensel, R. (2024). Effects of additions to independent silent reading on students’ reading proficiency, motivation, and behavior: Results of a meta-analysis. *Educational Research Review, 42*, 100572. https://doi.org/10.1016/j.edurev.2023.100572

5. Tang, M., Lau, K.-L., & Du, Y. (2026). Effects and moderators of dialogic reading on children’s reading literacy: A three-level meta-analysis on studies from 2000 to 2025. *International Journal of Educational Research, 137*, 102963. https://doi.org/10.1016/j.ijer.2026.102963

6. Xie, W., & Lin, X. (2025). Are dialogic teaching-and-learning programs effective in pre-primary and primary schools? A meta-analysis. *Teaching and Teacher Education, 151*, 104823. https://doi.org/10.1016/j.tate.2024.104823

7. Schiefele, U., Stutz, F., & Schaffner, E. (2023). Effectiveness of interventions that foster reading motivation: A meta-analysis. *Educational Psychology Review, 35*, 21. https://doi.org/10.1007/s10648-023-09719-3

8. Stevens, R. J., van Meter, P., & Warcholak, N. D. (2010). The effects of explicitly teaching story structure to primary grade children. *Journal of Literacy Research, 42*(2), 159–198. https://doi.org/10.1080/10862961003796173

DEVELOPING FUTURE TEACHERS' INTERCULTURAL-PROFESSIONAL COMPETENCE THROUGH THE "INTERNATIONALIZATION AT HOME" APPROACH

Egamberdiyev Oyatillokh Alisher ugli –

PhD Researcher, Fergana State University

E-mail: eoyatillox@gmail.com

ORCID: https://orcid.org/0009-0006-9557-9386

Abstract. *The internationalization of higher education can no longer be reduced to physical mobility, because only a limited proportion of students are able to participate in study-abroad programmes. This article examines the pedagogical potential of Internationalization at Home (IaH) for developing future teachers' intercultural-professional competence in domestic university settings. The study uses a theoretical-analytical design based on an integrative review of major research on IaH, intercultural competence, internationalized curricula, global competence, and teacher education. The analysis identifies five mutually connected pedagogical mechanisms: internationalized curriculum content, structured intercultural contact, collaborative professional tasks, guided reflection and feedback, and competence-based assessment. On this basis, intercultural-professional competence is conceptualized as an integrated capacity that combines cultural knowledge, respectful professional communication, adaptive pedagogical decision-making, inclusive values, and reflective self-regulation.*

Keywords: *Internationalization at Home; future teachers; intercultural-professional competence; teacher education; internationalized curriculum; intercultural learning; global competence.*

INTRADUCTION

Internationalization has become a defining dimension of contemporary higher education, yet its educational value depends on whether international and intercultural learning is accessible to all students rather than only to those who participate in physical mobility. Beelen and Jones) define Internationalization at Home (IaH) as the purposeful integration of

international and intercultural dimensions into the formal and informal curriculum for all students within domestic learning environments. This definition shifts attention from mobility as an activity to learning outcomes as the central purpose of internationalization. In teacher education, such a shift is especially significant because future teachers are expected to work in increasingly diverse classrooms, interpret multiple cultural perspectives, communicate across differences, and prepare pupils for an interconnected world.

The problem is not simply the absence of international exposure. A more important challenge is that intercultural learning does not emerge automatically from the presence of foreign content, international students, or English-medium resources. It requires intentionally designed interaction, pedagogically meaningful tasks, guided reflection, and assessment. Leaskemphasizes that meaningful contact between home and international students must be supported through both formal and informal curricula. Likewise, Deardorff demonstrates that intercultural competence is developmental and includes attitudes, knowledge, skills, and appropriate internal and external outcomes rather than a single communicative skill. Accordingly, the purpose of this article is to substantiate a pedagogical model for developing future teachers' intercultural-professional competence through IaH. The article addresses two questions: (1) Which pedagogical mechanisms of IaH are most relevant to future teachers' professional development? (2) How can these mechanisms be integrated into a coherent competence-development model suitable for domestic teacher-education programmes?

The analytical procedure consisted of four stages. First, the literature was examined to identify recurring learning outcomes associated with IaH. Second, reported pedagogical practices were grouped according to their function in the learning process. Third, these practices were interpreted

specifically from the perspective of professional teacher formation rather than general student development. Finally, the resulting categories were integrated into a conceptual model of intercultural-professional competence development. Because the study is conceptual rather than experimental, the results are presented as an evidence-informed pedagogical synthesis and do not claim causal effectiveness for a particular intervention. The analysis indicates that intercultural-professional competence should be understood as a professionalized form of intercultural competence. For future teachers, knowing cultural differences is insufficient unless that knowledge can be transformed into pedagogically appropriate action. The construct therefore includes five interrelated dimensions: (1) cognitive-cultural knowledge understanding cultural variation, educational traditions, and global-local interdependence; (2) communicative-interactional competence the ability to communicate respectfully and effectively across linguistic and cultural differences; (3) adaptive-pedagogical competence the capacity to modify teaching, explanation, collaboration, and classroom decisions in response to learner diversity; (4) axiological-ethical orientation openness, respect, fairness, inclusion, and responsibility; and (5) reflective-evaluative competence the ability to examine one's assumptions, biases, decisions, and professional growth.

Five pedagogical mechanisms were identified as central to the IaH-based development of these dimensions. The first is internationalized curriculum content. International perspectives should be embedded in course outcomes, cases, readings, examples, and assessment tasks rather than added as occasional "international" topics. The second mechanism is structured intercultural contact. Contact becomes educationally meaningful when students work with international peers, visiting academics, diaspora communities, culturally diverse local groups, or virtual partners around clearly defined professional tasks. The third mechanism is collaborative

problem solving. Future teachers can compare lesson designs, analyse culturally sensitive classroom cases, co-create teaching resources, or discuss inclusive responses to educational dilemmas.

The fourth mechanism is guided reflection. Intercultural encounters can reinforce stereotypes if students are not supported to interpret difference critically. Reflective journals, debriefing questions, peer feedback, and facilitated dialogue help students move from simple description ("they do it differently") toward explanation, perspective taking, and pedagogical transfer ("how should this influence my teaching?"). The fifth mechanism is competence-based assessment. Intercultural learning should be assessed through evidence of performance, including case analysis, reflective writing, observation, peer assessment, portfolios, and scenario-based tasks. Deardorff specifically argues for combining multiple assessment methods rather than relying on a single self-report measure.

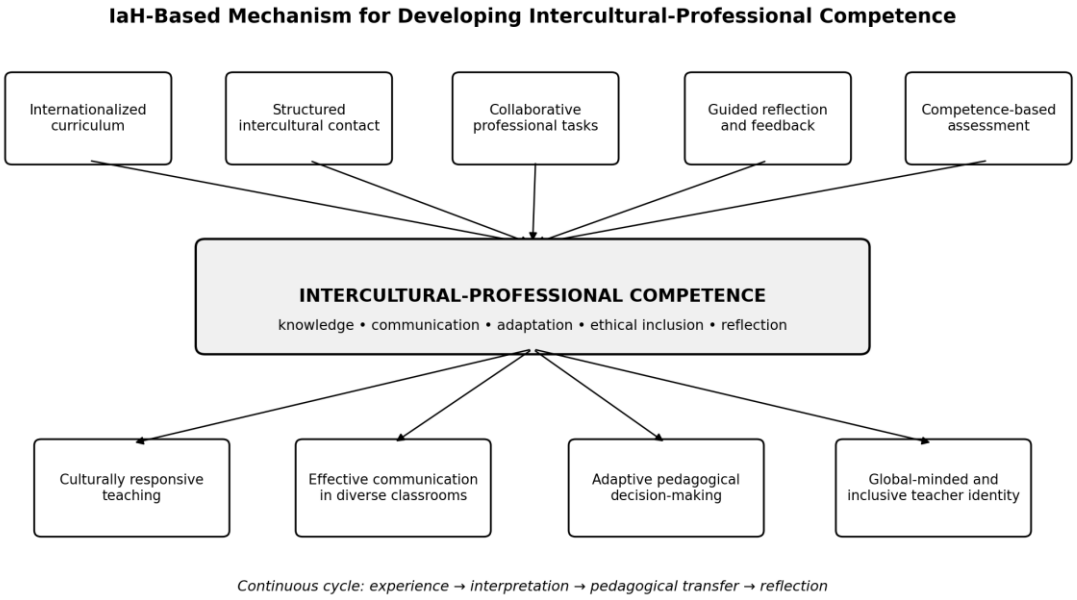


Figure 1. Conceptual model of IaH-based development of future teachers' intercultural-professional competence

Figure 1 represents IaH as a developmental mechanism rather than a set of isolated international activities. The five pedagogical inputs converge

in intercultural-professional competence and lead to professional outcomes that are directly relevant to teaching: culturally responsive practice, effective communication in diverse classrooms, adaptive pedagogical decision-making, and an inclusive global-minded teacher identity. The lower cycle in the model emphasizes that competence develops through repeated movement from experience to interpretation, pedagogical transfer, and reflection. This model is consistent with broader evidence on IaH. Soulé et al, in a systematic review of teaching and learning practices, reported that IaH is increasingly implemented through technology-supported and collaborative formats and is associated with intercultural sensitivity, collaboration, and skills development. Their review also identified linguistic, technical, pedagogical, organizational, and intercultural challenges, indicating that implementation quality matters. Hangyál et al. similarly concluded that IaH most consistently develops intrapersonal and interpersonal skills when internationalization is strategically aligned with curriculum and pedagogy. Therefore, institutional internationalization policies alone are not sufficient; the decisive level is the learning design experienced by students.

The proposed model has several implications for teacher education. First, IaH offers an equity-oriented pathway to international learning. Physical mobility is valuable, but financial, linguistic, family, institutional, or visa-related constraints can prevent many students from studying abroad. IaH does not treat non-mobile students as a secondary group; instead, it brings international and intercultural learning into the ordinary curriculum. This principle is particularly important in systems where outbound mobility remains selective or limited.

Second, the professional context of teacher education changes the meaning of intercultural competence. Future teachers require more than interpersonal tolerance. They need to interpret culturally shaped learner behaviour, communicate with families and colleagues, select inclusive

examples and materials, prevent stereotyping, and adapt pedagogy without lowering academic expectations. The OECD global competence framework similarly emphasizes examining global and intercultural issues, appreciating different perspectives, interacting respectfully, and taking responsible action. In teacher education, these capacities should be translated into professional classroom decisions.

Third, interaction with international students and partners should be intentionally connected to coursework. Empirical evidence from teacher education shows that conversational partnerships can stimulate reflection on ethnocentrism and support confidence in diverse teaching contexts (Çiftçi & Çinpolat, 2025). Li and Costa likewise demonstrate the potential of home-based internationalization to develop empathy through language learning and an encounter with "otherness." These findings reinforce the role of guided contact and reflection in the proposed model.

For implementation, teacher-education programmes can begin with modest but systematic interventions: international comparative cases in pedagogy courses, joint online projects with partner universities, multilingual or multicultural classroom simulations, interaction with international students on campus, collaborative analysis of educational policies from different countries, and reflective portfolios documenting changes in professional understanding. These activities should not be episodic. Their learning outcomes need to be mapped across courses and assessed progressively so that students encounter increasingly complex intercultural-professional tasks.

A further implication concerns curriculum sequencing. IaH is most likely to produce durable professional development when intercultural learning is distributed across the programme rather than concentrated in one elective course. At an introductory level, students may compare educational concepts and cultural assumptions; at an intermediate level, they may

collaborate with peers from other linguistic or national backgrounds; and at an advanced level, they may solve complex professional cases, design inclusive lessons, and justify pedagogical choices for culturally diverse learners. Such progression turns internationalization into a cumulative competence pathway and allows teacher educators to observe development over time.

Assessment should follow the same developmental logic. Cognitive-cultural knowledge can be examined through comparative analysis of educational practices; communicative-interactional competence can be assessed through observed dialogue, teamwork, and presentation; adaptive-pedagogical competence can be evaluated through scenario-based lesson design; axiological-ethical orientation can be explored through reflective narratives and responses to dilemmas; and reflective-evaluative competence can be documented through portfolios and self-assessment supported by external feedback. The purpose of assessment is not to label students as culturally competent or incompetent, but to make growth visible and identify the next developmental task.

Successful implementation also requires institutional and faculty-level conditions. Teacher educators need preparation for facilitating sensitive intercultural dialogue, managing unequal participation, and preventing superficial cultural comparisons. International partners should be selected not only for prestige but for pedagogical complementarity and reciprocity. Language support and accessible digital tools may be necessary so that linguistic proficiency does not become the sole determinant of participation. Finally, activities should include explicit ethical principles: respect for difference, avoidance of stereotyping, equal intellectual contribution, and critical attention to power relations. These conditions help ensure that IaH remains an educational process rather than a symbolic display of internationalization.

The study also has limitations. It is a conceptual synthesis and does not test the proposed model experimentally. The framework therefore requires empirical validation through diagnostic instruments, intervention studies, classroom observations, and mixed-method assessment in different teacher-education contexts. Future studies should examine which IaH combinations are most effective for different disciplines, year levels, and institutional conditions, and how competence development can be sustained after the intervention ends.

Internationalization at Home provides a practical and inclusive framework for connecting internationalization with the everyday professional preparation of future teachers. The analysis shows that its educational value emerges when internationalized curriculum content, structured intercultural contact, collaborative professional tasks, guided reflection, and competence-based assessment operate as an integrated system. Within this system, intercultural-professional competence develops as a combination of cultural understanding, professional communication, adaptive pedagogical action, inclusive values, and reflective self-regulation.

For teacher education, the central implication is clear: internationalization should be experienced as a mode of learning and professional practice, not merely as mobility or institutional cooperation. By embedding meaningful intercultural experiences into domestic learning environments, universities can prepare a wider range of future teachers to work responsibly and effectively in culturally diverse and globally connected educational settings.

REFERENCES

1. Beelen J., Jones E. Europe calling: A new definition for Internationalization at Home // International Higher Education. – 2015.
2. Çiftçi E.Y., Çinpolat E. Internationalisation at Home and teacher education: Engaging international students as conversational partners // European Journal of Education. – 2025.

3. Deardorff D.K. Identification and assessment of intercultural competence as a student outcome of internationalization // Journal of Studies in International Education. – 2006.

4. Hangyál Z., Schiller E., Dorner H. A systematic literature review on Internationalisation at Home from 2019–2024: Intersections of initiatives and student skill development // Innovations in Education and Teaching International. – 2026. – Advance online publication.

5. Leask B. Using formal and informal curricula to improve interactions between home and international students // Journal of Studies in International Education. – 2009.

6. Li H., Costa C. Internationalising teacher education at home: Developing empathy through the sense of otherness in language learning // European Journal of Teacher Education. – 2023. – Advance online publication.

7. OECD. PISA 2018 Assessment and Analytical Framework. – Paris: OECD Publishing, 2019..

8. Soulé M.V., Parmaxi A., Nicolaou A. Internationalization at home in higher education: A systematic review of teaching and learning practices // Journal of Applied Research in Higher Education. – 2024.

9. Egamberdiyev O.A. Oliy ta’limni xalqarolashtirish sharoitida bo‘lajak o‘qituvchilarning kasbiy kompetentligini rivojlantirish tuzilmasi va komponentlari // Ta’limda istiqbolli izlanishlar: xalqaro ilmiy-metodik jurnal. – 2026. – № 8. – B. 388–395.

PHILOSOPHICAL FOUNDATIONS OF THE EDUCATIONAL TRANSFORMATION PROCESS

Rajabov Ilhom Mustafoyevich

Central Mining Administration, Navoi Mining and Metallurgical Company Joint-Stock Company Head of the Information, Spirituality and Enlightenment Group, Office Management Department; Independent Researcher, Bukhara State Pedagogical Institute

Abstract: *This article examines the philosophical foundations of educational transformation in the context of contemporary social, technological, and cultural change. Educational transformation is interpreted not merely as technological modernization, but as a complex socio-philosophical process involving qualitative changes in the aims, content, values, institutional structures, and human-centred orientation of education. Particular attention is paid to the impact of globalization, the digital economy, artificial intelligence, labour-market transformation, and cultural pluralism on the changing functions of education.*

Keywords: *educational transformation, philosophy of education, human capital, digitalization, artificial intelligence, axiological transformation, competency-based education, personal development, social determinism, communicative action, synergetics, human-centred education, creativity, social responsibility.*

INTRADUCTION

As human development becomes increasingly complex in the contemporary era, the education system, as one of the most dynamic spheres of social life, likewise requires continuous renewal. From a philosophical perspective, the term “transformation” (Lat. transformatio – change, alteration of form) denotes the qualitative renewal of an existing system and the emergence of new content within its essential structure.

Accordingly, educational transformation may be understood as the process of adapting the socio-philosophical foundations, aims, and content of the education system to changing social conditions. In J. Habermas’s view,

the development of society is manifested in the interaction and balance between cultural and communicative systems. From this perspective, educational transformation is not merely a process of technological modernization; it also entails profound cultural and axiological change.

Under the conditions of globalization, the digital economy, artificial intelligence, and cultural pluralism, the function of education can no longer be reduced to the transmission of knowledge alone. It increasingly involves guiding individuals toward self-understanding and a conscious sense of social responsibility. This idea is consonant with the educational philosophy of the American pragmatist J. Dewey, who regarded education not simply as preparation for life, but as an integral dimension of life itself.

Thus, transformative education is a system aimed at developing the individual as a socially active, spiritually mature person capable of consciously directing his or her own life.

In philosophy, the concept of social determinism refers to the dependence of changes occurring in society on socio-economic conditions and factors. Educational transformation unfolds within this framework as well: economic modernization, labour-market requirements, and the digital environment increasingly shape the forms, priorities, and institutional organization of education.

In the context of New Uzbekistan, the process of educational transformation is becoming closely integrated with the philosophy of human-capital development. This orientation places particular emphasis on the intellectual potential, knowledge, professional competence, civic responsibility, and creative capacity of young people. In this respect, the modernization of education is understood as one of the principal conditions for preparing a generation capable of participating effectively in contemporary social and economic development.

The philosophical essence of educational transformation is therefore grounded in a human-centred conception of development. Within this approach, the human being constitutes both the central purpose and the principal subject of the educational process. Transformative education manifests itself in three major dimensions:

• Content transformation — the transition from knowledge-centred learning to competency-based education and the development of practical and creative thinking;

• Technological transformation — digital instruction, online education, and educational models based on artificial intelligence;

• Axiological transformation — the integration of education with the values of spirituality, morality, responsibility, and diligence.

Education is one of the most active forms of interaction between the human being and reality. The philosophical tradition associated with Hegel's Phenomenology of Spirit gives this issue a deeper meaning by interpreting formation and education as processes through which consciousness develops toward self-understanding.

In the educational process, individuals do not merely acquire knowledge; they also form and develop their social essence. The relationship between education and personal development is therefore based on a dialectical unity: through education, the individual shapes the self, while through the development of individuals, education contributes to the transformation of society.

This relationship may also be interpreted through M. Scheler's philosophical anthropology, in which education and cultural formation are closely associated with the individual's understanding of his or her human essence and capacity to participate creatively in culture.

Personal development, in turn, provides a philosophical foundation for the formation of professional culture and the virtue of diligence. Labour,

education, and culture can thus be viewed as three interconnected dimensions of human existence.

Transformative changes in education are not merely technical; they also constitute spiritual, ideological, and axiological processes. Every educational system is oriented, explicitly or implicitly, toward particular ideas, values, and social purposes.

One of the conceptual orientations emerging in the education system of Uzbekistan is the development of an intellectual society through spiritual renewal. Within this framework, the education of young people is understood not only as the acquisition of knowledge, but also as the cultivation of spirituality, diligence, civic responsibility, and commitment to the development of society.

From a philosophical standpoint, this approach combines axiological and humanistic paradigms. The essence of education lies not merely in transmitting information, but in fostering constructive values, moral responsibility, creativity, and a capacity for socially meaningful action.

According to Habermas's theory of communicative action and moral consciousness, communication constitutes an important social mechanism through which mutual understanding and normative agreement are formed. Applied to education, this perspective suggests that educational transformation should place human interaction and values at the centre rather than treating information technologies as an end in themselves.

Synergetics, represented in contemporary thought by scholars such as H. Haken and I. Prigogine, makes it possible to conceptualize education as an open and self-organizing system. From this perspective, an educational system responds to changes in its social environment while simultaneously generating new forms of internal order, adaptation, and stability.

In this sense, educational transformation can be interpreted as a mechanism of self-renewal within a social system. It emerges through the

complex interaction of teachers, learners, public policy, institutional structures, and cultural values.

In general, educational transformation contributes to: the qualitative development of human capital; the renewal of social consciousness; and the maintenance of cultural stability and spiritual harmony.

Consequently, the philosophy of transformative education identifies the formation of the individual not as a passive consumer, but as a creative and socially responsible subject as one of its central objectives.

REFERENCES

1. Aristotle. Metaphysics. Oxford University Press, 1998.
2. Habermas, J. The Theory of Communicative Action. Boston: Beacon Press, 1984.
3. Dewey, J. Democracy and Education. New York: The Macmillan Company, 1916.
4. Mirziyoyev, Sh. M. Yangi O‘zbekiston strategiyasi [The Strategy of New Uzbekistan]. Tashkent: O‘zbekiston, 2021.
5. Hegel, G. W. F. Phenomenology of Spirit. Oxford: Clarendon Press, 1977.
6. Scheler, M. The Human Place in the Cosmos. Northwestern University Press, 2009.
7. Mirziyoyev, Sh. M. Address to the Oliy Majlis. 20 December 2023.
8. Habermas, J. Moral Consciousness and Communicative Action. MIT Press, 1990.
9. Prigogine, I., and Stengers, I. Order out of Chaos: Man’s New Dialogue with Nature. New York: Bantam Books, 1984.

REGIONAL OUTCOMES OF STATE POLICY ON PHYSICAL EDUCATION AND MASS SPORT DEVELOPMENT IN UZBEKISTAN: AN ANALYSIS BASED ON THE CASE OF NAVOIY REGION AND KARMANA DISTRICT

O‘ktamova Dilfuza O‘ktamovna

Navoiy davlat universiteti doktoranti,

Ijtimoiy falsafa yo‘nalishi

E-mail: *tturobkulov@gmail.com*

Tel: +998 91 4390470

ORCID: *ID 0009-0008-5363-1048*

Уктамова Дилфуза Уктамовна

докторант Навоийского государственного университета,

специальность «Социальная философия»

E-mail: *tturobkulov@gmail.com*

ORCID ID: *0009-0008-5363-1048*

Uktamova Dilfuza Uktamovna

Doctoral Student at Navoi State University,

Specialization: Social Philosophy

E-mail: *tturobkulov@gmail.com*

ORCID ID: *0009-0008-5363-1048*

Annotatsiya: *Ushbu maqolada O'zbekiston Respublikasida jismoniy tarbiya va ommaviy sportni rivojlantirish bo'yicha davlat siyosatining mintaqaviy amaliyoti Navoiy viloyati va uning tarkibidagi Karmana tumani misolida tahlil qilingan. Tadqiqot uchun asosiy empirik material sifatida mintaqaviy teleradiokompaniya hamda "Sport" telekanalining 2025-yil yakunlariga bag'ishlangan axborot-tahliliy dasturi materiallaridan foydalanilgan. Tahlil natijalarida viloyat miqyosida 18 ta sport ta'lim*

muassasasi faoliyat yuritayotgani, ularda 20 mingdan ortiq yoshlar muntazam shug'ullanayotgani, shuningdek, 2025-yil davomida sportchilar tomonidan turli darajadagi musobaqalarda 1859 medal qo'lga kiritilgani aniqlandi. Karmana tumani misolida esa mahalla darajasidagi ommaviy sport tadbirlari (78 ta musobaqa, 3,5 mingdan ortiq ishtirokchi), xotin-qizlar, imkoniyati cheklangan shaxslar va faxriylarni sportga jalb etish tajribasi o'rganilgan. Xulosa qilib aytish mumkinki, markaziy va mahalliy darajadagi chora-tadbirlarning uyg'unlashuvi ommaviy sportni rivojlantirishning muhim omili hisoblanadi.

Kalit so'zlar: *ommaviy sport, jismoniy tarbiya, davlat siyosati, Navoiy viloyati, Karmana tumani, sport infratuzilmasi, ijtimoiy inklyuziya.*

Abstract: *This article examines the regional implementation of Uzbekistan's state policy on physical education and mass sport development, using Navoiy region and its Karmana district as a case study. The empirical basis of the study consists of materials from regional television broadcasting, including a year-end analytical report of the "Sport" television channel and a special report of Navoiy regional television and radio company. The analysis shows that 18 sports educational institutions currently operate in the region, engaging more than 20,000 young people, and that regional athletes obtained 1,859 medals in competitions of various levels during 2025. At the district level, the case of Karmana demonstrates how mass sport events at the neighborhood (mahalla) level - 78 competitions with over 3,500 participants - together with targeted programs for women, persons with disabilities and elderly citizens, contribute to the broader national strategy. The findings suggest that coordination between central policy and local implementation is a key factor in the successful development of mass sport.*

Keywords: *mass sport, physical education, state policy, Navoiy region, Karmana district, sport infrastructure, social inclusion.*

Аннотация: *В статье анализируется региональная практика реализации государственной политики Республики Узбекистан по развитию физической культуры и массового спорта на примере Навоийской области и входящего в её состав Карманинского района. Эмпирической базой исследования послужили материалы регионального телерадиовещания, в том числе итоговая аналитическая программа телеканала «Sport» за 2025 год и специальный репортаж Навоийской областной телерадиокомпании. Анализ показал, что в области действует 18 спортивных учебных заведений, в которых регулярно занимаются более 20 тысяч молодых людей, а спортсмены региона в течение 2025*

года завоевали 1859 медалей на соревнованиях различного уровня. На примере Карманинского района рассмотрен опыт организации массовых спортивных мероприятий на уровне махалли (78 соревнований, свыше 3,5 тыс. участников), а также вовлечения женщин, лиц с ограниченными возможностями и пожилых граждан в спорт. Сделан вывод о том, что согласованность мер центрального и местного уровней является важным фактором развития массового спорта.

Ключевые слова: *массовый спорт, физическая культура, государственная политика, Навоийская область, Карманинский район, спортивная инфраструктура, социальная инклюзия.*

INTRODUCTION

In recent years, the development of physical education and mass sports has become a priority area of state policy in the Republic of Uzbekistan. The "Concept for the Development of Physical Education and Sports in the Republic of Uzbekistan until 2025," approved by the Decree of the President of the Republic of Uzbekistan (No. PF-5924) dated January 24, 2020, outlined specific tasks aimed at fostering a healthy lifestyle among the population, developing mass sports, upgrading sports infrastructure, and improving the system for training high-level athletes. The document envisages measures such as creating a competitive environment within the physical education and sports sector through public-private partnerships, constructing sports grounds in local communities (*mahallas*), and expanding the reach of sports clubs in educational institutions.

Studying the practical outcomes of this policy at the regional level and assessing the extent of its real-world implementation holds significant scientific and practical importance. After all, the effectiveness of strategic documents adopted at the central level is determined, first and foremost, by how they are implemented on the ground—at the regional, district, and community levels. In this context, the Navoi region and its Karmana district serve as a suitable case study, as consistent efforts have been made there in

recent years to develop sports infrastructure, engage the population in mass physical education, and train high-performance athletes.

The problem statement is as follows: while the majority of existing studies (e.g., Nazirov, 2022; Ma'murov et al.) address the history and theoretical-methodological foundations of physical education and sports at the national level, there has been insufficient research into the extent to which the quantitative targets set in central documents—such as engaging 30% of the population in mass competitions and 18% in regular training sessions [1]—are being met at the specific level of a region and its constituent district. This gap constitutes the scientific problem addressed by the present study.

The object of the study is the processes of developing physical education and mass sports in the Navoi region and Karmana district.

The subject of the study is the quantitative and qualitative indicators of these processes (infrastructure, participation rates, achievements, and the level of social inclusion) and their alignment with the targets established in state programs. The aim of the study is to analyze the regional implementation of state policy regarding the development of mass sports—using the Navoi region and Karmana district as case studies—to compare achieved results with the target indicators set in state programs, and to draw scientifically grounded conclusions regarding the potential for applying this experience in other regions.

To achieve this aim, the following tasks were defined: 1) systematizing the theoretical and legal foundations of regional sports policy; 2) analyzing sports infrastructure and mass participation indicators in the Navoi region; 3) examining practices at the *mahalla* (neighborhood) level using the Karmana district as an example; 4) comparing the obtained results with the targets established in national programs; and 5) developing recommendations for scaling up this regional experience.

The scientific novelty of the study lies in the fact that, for the first time, the sports indicators for the Navoi region and Karmana district for 2025 are examined within a unified analytical model (central policy – regional practice – *mahalla* level) and evaluated in the context of the quantitative targets established by Decree No. PF-5924 of the President of the Republic of Uzbekistan. The theoretical significance of the study lies in proposing a three-level model (national, regional, and local community) for analyzing regional sports policy, while its practical significance is demonstrated by the development of monitoring recommendations for local government bodies and sports administration agencies.

LITERATURE REVIEW

As a discipline, the theory of physical education and sports demonstrates that sport is a socio-pedagogical phenomenon, focusing on explaining and predicting its objective principles. Specifically, M.A. Tojiyev and Q.T. Arabboyev emphasize that sports theory comprises an interconnected set of theories regarding sports preparation, training, and athlete selection, noting that the social significance of physical culture and sport grows alongside societal development. Research by B.B. Ma'murov and his co-authors highlights the role of sport in social integration and individual socialization; as a mass social movement, the sports sector serves as a means to engage people in societal life and foster the development of social experience.

Studies critically analyzing the advantages and disadvantages of mass sports note that, while physical activity reduces the risk of obesity and cardiovascular disease—and promotes social cooperation and inclusivity—it can also encounter organizational challenges such as pressure, competition, and infrastructural inequalities. Although this study highlights the situation in the Karmana district as an example of positive practice, these findings indicate that the subject warrants further critical evaluation in future research.

An analysis of regulatory and legal sources indicates that the Concept approved by the Decree of the President of the Republic of Uzbekistan No. PF-5924 dated January 24, 2020, sets specific targets to engage 30 percent of the population in mass sports competitions and 18 percent in regular physical training activities nationwide. Furthermore, a relevant resolution dated February 13, 2019, outlined four priority areas for the development of physical culture and mass sports in Uzbekistan for the 2019–2023 period: mass sports, children's sports, women's sports, and high-performance sports. At the local community (mahalla) level, a new phase of engaging youth in mass sports has been initiated through projects such as the "Five Initiatives Olympiad." These regulatory documents serve as benchmarks for evaluating the performance indicators of the Navoi region and the Karmana district within the scope of this study.

Thus, the literature review demonstrates that while the theoretical and methodological foundations of the sports sector are well-established, there is a scarcity of research quantitatively assessing their practical implementation within specific regions—a fact that underscores the relevance of this article.

RESEARCH METHODOLOGY AND MATERIALS

The study employed descriptive-analytical and content analysis methods. Two types of primary materials were selected as the main empirical sources for the research:

- A special report titled "On the Path to Sports Development" by the Navoi Region TV and Radio Company (authored by F. O‘ktamova), which covers mass sports events in the Karmana district, the activities of sports schools, and work conducted with socially vulnerable groups;
- Materials from a year-end review program produced by the "Information-Analytical Programs" editorial office of the "Sport" TV channel, presenting annual statistical indicators for the Navoi region and achievements in international and national competitions.

Since these materials include interviews with officials (the district governor, the head of the regional sports department, sports school directors, and coaches) as well as numerical data, they can be regarded as reliable primary sources reflecting the practical outcomes of regional sports policy. Furthermore, the researcher presented the numerical data from these materials in their original form and analyzed them within the context of target indicators established by regulatory legal acts.

RESULTS AND ANALYSIS

Indicators of sports infrastructure and mass sports participation in the Navoi region

According to the analyzed data, there are currently 18 sports educational institutions operating in the Navoi region, involving 20,400 young people in regular training and employing 784 coaches. The region is home to 26 Olympic, 5 national, and 12 non-Olympic sports federations. The total number of athletes trained for national teams has reached 647.

Reconstruction and renovation works at the football academy in the city of Navoi were completed in 2025; the facility includes a modern dormitory, football pitches, a sports hall, and academic buildings capable of training and educating 154 young athletes simultaneously. This can be viewed as the result of a consistent policy aimed at upgrading sports infrastructure in the region.

The table below compares key indicators for the Navoi region with national-level targets established by Decree No. PF-5924 of the President of the Republic of Uzbekistan:

Indicator	National target [1]	Indicator for Navoi Region
Coverage in sports facilities	30% of youth across 12,000+ facilities	20.4 thousand individuals across 18 sports educational institutions

Indicator	National target [1]	Indicator for Navoi Region
Coach capacity	No specific numerical target (qualitative indicator)	784 coaches
Athletes prepared for the national team	No specific national target cited	647 athletes
Share of women in mass participation events (Karmana)	Women's sports designated as a specific priority area	643 out of 3,500 (≈18.4%)

Achievements in International and National Competitions

By the end of 2025, athletes from the Navoi region had won a total of 1,859 medals—comprising 525 gold, 577 silver, and 757 bronze—across Uzbekistan, Asian, and World championships and cups, as well as prestigious international competitions. The breakdown of these medals is as follows: 1,540 were won at Uzbekistan championships and cups, 116 at Asian championships and cups, 108 at World championships and cups, and 95 at other prestigious international competitions.

It is particularly noteworthy that at the 5th Asian Youth Para Games, held in Dubai, United Arab Emirates, from December 7 to 14, athletes from the Navoi region competed in para-athletics, para-taekwondo, para-swimming, para-armwrestling, and para-powerlifting, securing a total of 33 medals (25 gold, 4 silver, 4 bronze). This achievement demonstrates not only the high level of sporting success but also the effectiveness of the conditions being created for athletes with disabilities. Additionally, Bunyod Hasanov won a gold medal in the -51 kg weight category of Greco-Roman wrestling at the "President's Olympiad" competition.

The Karmana District Experience: Grassroots Sports at the “Mahalla” Level

Behind regional-level aggregate figures lie practical efforts carried out at the local level. In Karmana District, 78 sports competitions and events

were held this year to engage the population in mass physical education and sports; over 3,500 residents participated, including 643 women. This figure demonstrates that policies aimed at expanding women's participation in grassroots sports are yielding tangible results.

"5,000-step" walking and running marathons have been organized across the district's 39 “mahallas” (neighborhood communities), alongside "Leader's Cup" football tournaments for “mahalla” teams and traditional competitions—such as volleyball—for employees of local enterprises and organizations. Currently, 1,447 students train regularly at the Karmana District Sports School under the guidance of 47 qualified coaches. Another major sports complex affiliated with the district sports school is located in the Jaloyir “mahalla”; it has become a key hub for promoting a healthy lifestyle among the local population, particularly the youth.

Social Inclusion: Sports for Persons with Disabilities and Veterans

A noteworthy aspect of the analyzed material is the expanding range of opportunities for citizens with physical disabilities—particularly the youth—to engage in sports. Necessary conditions are being created to enable their successful participation in international competitions, a fact reflected in the achievements at the Para Asian Games in Dubai.

Support for sports among veterans is also a priority within state policy; systematic efforts are underway in local communities to increase the number of sports-loving veterans, boost their physical activity, and ensure their leisure time is spent meaningfully. This demonstrates that the policy for developing mass sports is not limited to the youth but encompasses all age groups of the population.

DISCUSSION

The results indicate that, using the example of the Navoi region and Karmana district, strategic goals established at the state level—such as

engaging the population in mass physical education, developing sports infrastructure, and promoting healthy lifestyles, as outlined in the Concept approved by Decree No. PF-5924—are taking on specific practical forms at the local level. In particular, small-scale events at the *mahalla* level that attract high levels of participation (e.g., "5,000-step" marathons and inter-*mahalla* football cups) can be viewed as practical examples of a "bottom-up" model for developing mass sports; this empirically confirms theoretical concepts regarding the social integration function of sports discussed in the literature review.

The comparative analysis presented in Table 2 shows that the Navoi region's indicators regarding sports infrastructure and coaching capacity align with general national trends; however, the share of women participating in mass events (≈18.4%) remains disproportionately low relative to the goals of developing "women's sports"—a priority area declared in state programs. This issue should be highlighted as a priority requiring targeted measures in the next stage. At the same time, the risk of organizational inequality—often noted in critical literature on mass sports—remains an issue requiring specific examination in the case of the Karmana district, particularly through a comparison of infrastructure levels between central areas and remote neighborhoods (such as the Jaloyir neighborhood).

However, the study is subject to several methodological limitations. First, the sources utilized—materials from a broadcasting company—consist of informational and analytical programs rather than primary statistical reports; consequently, the figures cited have not undergone independent statistical verification. Second, the study is limited to data from a single region and a single district for a single year (2025), which restricts the generalizability of the findings. Third, relative indicators, such as the proportion of women, are available only for the Karmana district, requiring caution when extrapolating these figures to the entire region. Nevertheless,

the data presented serve as valuable descriptive material for illustrating the practical implementation of regional sports policy and for formulating preliminary hypotheses for future quantitative research.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the analysis, the following conclusions can be drawn:

- Sports infrastructure in the Navoi region (sports educational institutions, federations, and coaching capacity) is being consistently expanded, serving as a key factor in achieving high-level sports results (1,859 medals in 2025);
- The example of the Karmana district demonstrates the effective local implementation of central policy regarding mass sports events at the *mahalla* level (78 competitions, over 3,500 participants);
- Targeted efforts to engage women (643 participants), persons with disabilities (33 medals in Dubai), and veterans in sports are developing as a crucial aspect of ensuring social inclusion.

Based on the above, the following recommendations are proposed: first, to introduce a unified statistical system for monitoring mass sports events at the *mahalla* level; second, to replicate the experience of the "5,000 Steps" initiative and inter-*mahalla* competitions—successfully piloted in the Karmana district—in other districts; and third, to track programs supporting sports for persons with disabilities and veterans through dedicated statistical reporting formats. For future research, it is recommended to conduct a comparative analysis covering multiple regions, as well as quantitative studies based on official statistical data.

REFERENCES

1. Decree of the President of the Republic of Uzbekistan No. PF-5924 dated January 24, 2020, "On Approval of the Concept for the Development of Physical

Education and Sports in the Republic of Uzbekistan until 2025." // lex.uz National Legal Information Database.

2. Nazirov B.S. History of Physical Culture and Sports in Uzbekistan. - Tashkent: "Tafakkur Avlodi", 2022.

3. Navoi Region TV and Radio Company. Special report titled "On the Path of Sports Development" / Author: F. O'ktamova; Cinematographer: M. Umirov; Editor: J. Narziyev; Chief Editor: N. Xolmirzayeva, 2025.

4. "Sport" TV Channel, "Information-Analytical Programs" Editorial Office. Materials for the program summarizing December 2025 / Segment author: F. O'ktamova; Cinematographer: M. Umirov, 2025.

5. Interview materials with J. Murtazoyev, Head of the Navoi Regional Sports Department, and Sh. Boltayev, Governor of Karmana District (December 2025).

6. Tojiyev M.A., Arabboyev Q.T. Theory and Methodology of Physical Culture (Theoretical Foundations of Sports Training): Textbook. - Tashkent: "O'zkitobsavdonashriyot", 2023. - 312 p. 7. Ma'murov B.B., Xamraev I.T., Djurayeva M.Z., Utepbergenov A.K. Theory and Methodology of Physical Culture (Theoretical and Practical Foundations of Sports Activity). - Bukhara: Bukhara State University, study guide.

8. Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated February 13, 2019, "On Approving the Concept for the Development of Physical Culture and Mass Sports in Uzbekistan for 2019–2023." // lex.uz National Legal Information Database.

9. Document on measures to elevate the involvement of youth in mass sports within *mahallas* (neighborhood communities) to a new level. // president.uz official portal.

10. Mass sports and associated shortcomings: a literature review. // Academia One scientific platform.

Andryushchenko, L.B. Sports-oriented technology for teaching students the subject "Physical Culture" / L.B. Andryushchenko // Theory and Practice of Physical Culture. - 2003. - No. 2. - P. 47-55.

Anisimov, S.F. Morality and Behavior / S.F. Anisimov. - Moscow: Mysl, 1979. - 230 p.

Aptsiauri, L.Sh. Sport as a social phenomenon and a factor in the socialization of the individual / L.Sh. Aptsiauri // Theory and Practice of Physical Culture. - 2003. - No. 1. - P. 12-14.

Asmolov, A.G. Psychology of Personality / A.G. Asmolov. - M., - 1990. - 309 p.

Asmolov, A.G. Lichnost kak predmet psychologicheskogo issledovaniya / A.G. Asmolov. - M., 1984. - 179 p.

Asmolov, A.G. The individuality of psychology. Methodological os¬novy razvitiya lichnosti v historiko-evolyutsionnom protsesse / A.G. Asmolov. - M.: MGU, 1986. - 699 p.

Akhverdova, O.A., Magin, V.A. Study of the phenomenon of "health culture" in the field of professional physical education /

O.A. Akhverdova, V.A. Magin // Theory and practice of physical culture. - 2002. - No. 9. - S.5-7.

Akhtyamova, G.E., Feizov, E.Z. Monizm materii i soznania / G.E. Akhtya-mova, E.Z. Feizov // Problemy nauchnogo i vnenauchnogo poznaniya. Sbornik nauchnykh trudov kafedry kompleksnykh issledovaniy po philosofii. - Cheboksary: izd-vo Chuvashskogo universiteta. - Vypusk 4. - 2004. - S.3-5.

Balsevich, V.K. Perspektivy razvitiya obshchey teorii i tekhnologii sportivnoy podgotovki i fizicheskogo vospitaniya (methodological aspect) / V.K. Balsevich // Theory and practice of physical culture. 1999,-№4.-S. 21.

Balsevich, V.K. Physical culture for women and men /

B.K. Balsevich. - M.: FiS, 1988. - 208 p.

Balsevich, V.K., Lubysheva, L.I. Informatsionnaya kultura spetsia¬lista kak faktor vnedreniya novykh tekhnologii v praktiku fizicheskoy kultury i sporta / V.K. Balsevich, L.I. Lubysheva // Theory and practice of physical culture. - 2000 - #10. - S.56.

Balsevich, V.K., Lubysheva, L.I. Physical culture: youth and modernity / V.K. Balsevich, L.I. Lubysheva // Theory and practice of physical culture. - 1995. - No. 4. - S. 2-8.

Barbashov, C.B. Teoretiko-metodologicheskie osnovy lichnostno-orentirovannoy tekhnologii fizkulturnogo obrazovaniya shkolnikov: avtoref. dis. dr. ped. nauk / C.B. Barbashov. - Omsk, 2000.- 48 p.

Baronenko, V.A., Lyubertsev, V.N., Rappoport, L.A. Osnovy zdorovogo obraza jizni / V.A. Baronenko, V.N. Lyubertsev, L.A. Rappoport.- Eka-terinburg: Izd-vo UGTU, 1999. - 410 p.

Belenov, D.L., Rodionov, A.B., Uvarov, E.A. Individual approach to the formation of health style / D.L. Belenov, A.B. Rodionov, E.A. Uvarov // Theory and practice of physical culture. - 2006. - No. 1. -

C. 50-52.

Bogoyavlenskaya, D. B. Intellectual activity and problems of creation / D.B. Bogoyavlenskaya.— Rostov-on-Don, 1984. - 238 p.

Bykhovskaya, I.M. Fizicheskoy culture kak prakticheskaya axiology chelovecheskogo tela / I.M. Bykhovskaya // Theory and practice of physical culture. - 1996. - No. 2. - S. 19-27.

Bykhovskaya, I.M. Obrazovanie i kultura zdorovya / I.M. Bykhovskaya //Deti Rossii obrazovany i zdorovy Materialy III Vserossiyskoy na¬uchno-prakticheskoy konferentsii g. Moscow, October 28-29, 2005. - M. - 2005. - S.28-32.

Vardolitskaya, A. P. Moral regulation of behavior / A.P. Vardolitskaya. - Minsk, 1987. -

SHAHAR YO'L INFRATUZILMASIDA VAQTINCHALIK TIRBANDLIKLARNI KAMAYTIRISH UCHUN DATCHIKLAR VA MASOFAVIY MONITORING TIZIMLARINI INTEGRATSIYA QILISHNI TEXNIK TA'LIMDA O'QITISHNING PEDAGOGIK-METODIK MODELI

N.B.Xolmurzayev

Termiz davlat muhandislik va agrotexnologiyalar universiteti

Annotatsiya. *Ushbu maqola shahar yo'l infratuzilmasida vaqtinchalik tirbandliklarni bartaraf etishga mo'ljallangan IoT (Narsalar interneti) datchiklari, sun'iy intellekt va masofaviy monitoring tizimlarini texnik oliy va o'rta maxsus ta'lim muassasalarida pedagogik nuqtai nazardan o'qitish metodikasiga bag'ishlanadi. Maqolada murakkab muhandislik konsepsiyalarini ta'lim oluvchilarga samarali yetkazishda muammoli ta'lim (Problem-Based Learning - PBL), STEM yondashuvi, virtual simulyatsiya dasturlari (SUMO) hamda apparat-dasturiy maketlashtirish usullarining pedagogik va didaktik asoslari tahlil qilingan. O'tkazilgan pedagogik tajriba-sinov ishlari shuni ko'rsatdiki, taklif qilingan simulyatsion-loyihaviy model talabalarning mantiqiy muhandislik fikrlash ko'nikmalarini 28.4% ga, murakkab texnik vaziyatlarda qaror qabul qilish tezligini 32.2% ga oshiradi.*

Kalit so‘zlar: *Muhandislik pedagogikasi, Aqlli transport tizimlari (ITS), vaqtinchalik tirbandliklar, muammoli ta'lim (PBL), STEM, interaktiv simulyatsiya, SUMO dasturi, raqamli kompetensiya, IoT datchiklar.*

Abstract: *This article is dedicated to the pedagogical methodology of teaching IoT (Internet of Things) sensors, artificial intelligence, and remote monitoring systems designed to eliminate temporary traffic congestion in urban road infrastructure within higher and secondary specialized technical educational institutions. The article analyzes the pedagogical and didactic foundations of Problem-Based Learning (PBL), the STEM approach, virtual simulation software (SUMO), and hardware-software prototyping methods in effectively conveying complex engineering concepts to learners. Conducted pedagogical experimental and testing work demonstrated that the proposed simulation-*

project model increases students' logical engineering thinking skills by 28.4% and their decision-making speed in complex technical situations by 32.2%.

Keywords: *Engineering pedagogy, Intelligent Transportation Systems (ITS), temporary congestion, Problem-Based Learning (PBL), STEM, interactive simulation, SUMO software, digital competence, IoT sensors.*

KIRISH VA MAVZUNING DOLZARBLIGI.

Bugungi kunda jahonning yirik va jadal rivojlanayotgan shaharlarida avtomobillar sonining keskin ortishi yo'l-transport infratuzilmasiga ulkan og'irlik tushirmoqda. Ayniqsa, pik soatlarida, yo me'moriy va qurilish ishlari olib borilayotgan hududlarda, yoki kutilmagan yo'l-transport hodisalari (YTH) sodir bo'lganda yuzaga keladigan vaqtinchalik tirbandliklar shahar iqtisodiyotiga va aholi turmush sifatiga jiddiy salbiy ta'sir ko'rsatmoqda. Vaqtinchalik tirbandliklarni an'anaviy yo'l belgilarini qo'lda boshqarish orqali hal etib bo'lmaydi; buning uchun zamonaviy IoT (Narsalar interneti) datchiklari, optik va ultratovush skanerlar, radarlar va real vaqt rejimida ishlaydigan masofaviy monitoring va adaptiv boshqaruv tizimlari talab etiladi.

Biroq, ushbu zamonaviy texnik va texnologik yechimlarni amaliyotga tatbiq etishning eng asosiy va strategik hal qiluvchi bo'g'ini bu — yetuk, raqamli ko'nikmalarga ega va tizimli fikrlaydigan muhandis kadrlarni tayyorlashdir. Muhandislik ta'limidagi mavjud an'anaviy pedagogik usullar (sathiy ma'ruzalar, nazariy tushuntirishlar) Aqlli Transport Tizimlari (ITS) kabi fanlararo va murakkab fanlarni o'qitishda yetarli samara bermayapti. Talabalar murakkab matematik va fizik modellarni, masofaviy datchik ma'lumotlarini qanday qilib amaliy yo'l harakatini boshqarish algoritmiga aylantirishni tasavvur qilishda metodik qiyinchiliklarga duch kelmoqda.

Tadqiqotning pedagogik metodologiyasi va yondashuvlar. Muhandislik ta'limida vaqtinchalik tirbandliklar va masofaviy monitoring

mavzusini muvaffaqiyatli o'zlashtirish uchun bir necha yetakchi pedagogik konsepsiya va yondashuvlar integratsiya qilindi:

1. Problem-Based Learning (PBL - Muammoli Ta'lim): Talabalarga tayyor nazariy formula yoki qoidalarni berish o'rniga, ularga real shahar chorrahasida yuzaga kelgan vaqtinchalik tirbandlik kaysi (problematic case) taqdim etiladi. Masalan: 'Chorrahada ta'mirlash ishlari tufayli yo'lning bir bo'lagi yopilgan, 10 daqiqa ichida 2 km uzunlikdagi tirbandlik hosil bo'ldi. Datchiklar ma'lumotidan foydalanib, muammoni qanday hal etasiz?' Ushbu pedagogik vazifa talabani izlanishga, datchik ma'lumotlarini tahlil qilishga va mantiqiy yechim izlashga majbur qiladi.

2. STEM va Fanlararo Yondashuv: Vaqtinchalik tirbandlikni boshqarish mavzusi o'zida Fizika (datchiklarning ishlash prinsipi), Matematika (transport oqimi diferensial tenglamalari), Axborot Texnologiyalari (masofaviy monitoring va dasturlash) hamda Injiniring (svetofor fazalarini loyihalash) fanlarini birlashtiradi. Pedagogik jarayon ushbu fanlarni sun'iy ravishda ajratmay, yagona muhandislik loyihasi atrofida jipslashtiradi.

3. Konstruktivizm va Amaliy-Simulyatsion Ta'lim: J.Piaje va L.Vigotskiyning konstruktivizm nazariyasiga ko'ra, bilim shunchaki uzatilmaydi, balki talaba tomonidan amaliy faoliyat jarayonida 'quriladi'. Shu sababli, virtual simulyatsiya (SUMO, VISSIM) va fizik maketlar yordamida mashg'ulot o'tkazish talabalarda chuqur, mustahkam va kasbiy kompetensiyalarni shakllantiradi.

1-jadval.

An'anaviy va zamonaviy simulyatsion-pedagogik yondashuvlarning qiyosiy xarakteristikasi

Pedagogik Mezon	An'anaviy O'qitish Ushuli	Muammoli Ta'lim (PBL)	Simulyatsion-Raqamli Metod	Loyiha-STEM Yondashuvi

Mashg'ulot Shakli	Monologik ma'ruza, daftarga yozish	Real keys tahlili va debat	SUMO dasturida modellashtirish	Arduino/IoT maketini yig'ish
Talabaning Rolli O'rni	Passiv eshituvchi, yod oluvchi	Muammoni tadqiq etuvchi	Model va ssenariy loyihalovchi	Muhandis, tizim yaratuvchisi
O'qituvchining Rolli O'rni	Axborot yetkazuvchi yagona manba	Fasilitator va yo'naltiruvchi	Konsultant va ilmiy ekspert	Loyiha mentori va baholovchi
Shakllanadigan Kompetensiya	Yuzaki nazariy bilimlar	Tahliliy va mantiqiy fikrlash	Raqamli muhandislik va simulyatsiya	Kompleks kasbiy ko'nikma, jamoaviy ish

Datchiklar va monitoring tizimlarini o'qitishning didaktik modeli. Shahar infratuzilmasida vaqtinchalik tirbandliklarni kamaytirish texnologiyalarini talabalarga o'rgatish uchun biz tarafimizdan 4 bosqichli bosqichma-bosqich (stepped pedagogical framework) pedagogik model va mashg'ulotlar sxemasi ishlab chiqildi.

Birinchi Bosqich: Nazariy-Konseptual va Texnik Tushunchalar. Ushbu bosqichda talabalar masofaviy monitoring tizimining fizik va texnik asoslari bilan tanishadilar. O'qituvchi interaktiv multimedia taqdimotlari va video-darsliklar orqali quyidagi datchik turlarini va ularning ishlash prinsiplarini tushuntiradi:

• Induktiv halqali datchiklar (Inductive Loop Detectors): Yo'l qoplamasi ostiga joylashtirilib, metal massasi o'tishini va avtomobil mavjudligini aniqlaydi.

• Ultratovush va Radar datchiklar: Yo'lak ustiga o'rnatilib, transport vositalari tezligini va masofasini aniqlaydi.

• AI videokameralar va Optik datchiklar: Kompyuterli ko'rish (Computer

Vision) algoritmiga asoslanib, avtomobillar soni, turi va oqim tezligini aniqlaydi.

Ikkinchi Bosqich: Matematik Modellashtirish va Didaktik Integratsiya. Pedagogik jarayonda shunchaki apparatni o'rganish yetarli emas. Talaba transport oqimi dinamikasini matematik modellashtirishni o'rganishi shart. Ushbu bosqichda Lighthill-Whitham-Richards (LWR) va Greenshields gidrodinamik modellari didaktik moslashtirilib o'rgatiladi:

$$\partial k(x,t) / \partial t + \partial q(x,t) / \partial x = s(x,t)$$

Matematik-pedagogik talqin: Tenglamada k(x,t) — transport zichligi (avto/km), q(x,t) — oqim intensivligi (avto/soat), s(x,t) esa tashqi ta'sir yoki vaqtinchalik tirbandlik Manbasi/Oqimining o'zgarishi. Talabalarga beriladigan pedagogik vazifa: datchiklardan kelayotgan k(x,t) ma'lumoti kritik chegaradan ($k > k_{crit}$) oshganda, adaptiv svetoforning yashil chiroq vaqtini algoritmik hisoblab chiqish va tenglamani yechish.

Uchinchi Bosqich: Virtual Simulyatsiya va Dasturiy Modellashtirish (SUMO). Amaliy-simulyatsion mashg'ulotlarda talabalar SUMO (Simulation of Urban MObility) ochiq manbali simulyatsiya dasturida ishlaydilar. Talabalar virtual shahar xaritasini (OSM - OpenStreetMap manbasidan) yuklab oladilar hamda unda vaqtinchalik tirbandlik o'choqlarini hosil qiladilar. So'ngra virtual datchiklar (induction loops, lane area detectors) joylashtirib, Python dasturlash tili orqali TraCI (Traffic Control Interface) boshqaruv skriptini yozadilar. Agar datchik tirbandlikni aniqlasa, dastur avtomobillarni muqobil aylanma yo'llarga yo'naltiradi.

To'rtinchi Bosqich: Apparat-Dasturiy Maketlashtirish va Jamoaviy Loyiha. Pedagogik modelning yakuniy va eng yuqori bosqichi bu — STEM loyihadir. Talabalar 3-4 kishilik kichik guruhlarga bo'linadi. Ular Arduino yoki Raspberry Pi mikrokontrollerlari, ultratovush datchiklari (HC-SR04), svetofor diodlari va ESP8266 Wi-Fi modullari yordamida aqlli

chorraha maketini yig'adilar. Datchik yo'lda avtomobil to'planib qolganini ko'rsa, ma'lumot serverga (masofaviy monitoring) uzatiladi va svetofor avtomatik ravishda yashil faza vaqtini uzaytiradi.

Pedagogik tajriba-sinov ishlari va natijalar tahlili. Taklif etilgan pedagogik modelning samaradorligini va hayotiyligini tekshirish maqsadida 2025-2026 o'quv yilida texnik oliy ta'lim muassasasining 'Transport tizimlari va yo'l harakatini tashkil etish' hamda 'Axborot tizimlari' yo'nalishi talabalari (jami 60 nafar talaba) o'rtasida pedagogik tajriba-sinov ishlari olib borildi.

Talabalar teng ravishda 2 guruhga bo'lindi: Nazorat guruhi (30 nafar) va Tajriba guruhi (30 nafar). Nazorat guruhida vaqtinchalik tirbandliklar va monitoring mavzusi an'anaviy ma'ruza hamda nazariy laboratoriya shaklida o'tildi. Tajriba guruhida esa ushbu maqolada keltirilgan 4 bosqichli simulyatsion-loyihaviy (SUMO + IoT maket) pedagogik model qo'llanildi.

2-jadval.

Pedagogik tajriba-sinov natijalari va talabalarning kasbiy kompetensiyalari dinamikasi

Baholash Mezonlari (Kompetensiyalar)	Nazorat Guruhi (An'anaviy)	Tajriba Guruhi (Interaktiv-PBL)	O'sish Dinamikasi (%)
Nazariy bilimlarni chuqur o'zlashtirish	63.5%	86.2%	+ 22.7% (Sezilarli)
Mantiqiy-muhandislik fikrlash darajasi	57.2%	85.6%	+ 28.4% (Yuqori)
Simulyatsiya dasturlarida (SUMO) ishlash	41.0%	88.5%	+ 47.5% (Eski metoddan keskin ustun)
Kutilmagan tirbandlikka yechim topish (PBL)	50.8%	83.0%	+ 32.2% (Yuqori)

Jamoaviy va loyihaviy ishlash kompetensiyasi	59.4%	89.0%	+ 29.6% (Yuqori)

Natijalar shuni ko'rsatadiki, simulyatsion va loyihaviy pedagogik usullardan foydalanilgan Tajriba guruhida talabalarning mantiqiy-muhandislik fikrlash darajasi 28.4% ga, murakkab tirbandlik vaziyatlarida muammoli yechim topish (PBL) ko'nikmasi 32.2% ga, simulyatsion dasturlar bilan ishlash mahorati esa 47.5% ga oshdi. Bu esa taklif qilingan metodikaning yuqori pedagogik samaradorligidan dalolat beradi.

XULOSA VA PEDAGOGIK TAVSIYALAR

Shahar yo'l infratuzilmasida vaqtinchalik tirbandliklarni kamaytirish uchun datchiklar va masofaviy monitoring tizimlarini o'qitish bo'yicha olib borilgan pedagogik tadqiqot quyidagi asosiy xulosalarni chiqarish imkonini beradi:

1. Vaqtinchalik tirbandliklarni boshqarish kabi murakkab va dinamik muhandislik jarayonlarini an'anaviy nazariy metodlar bilan o'qitish kutilgan samarasini bermaydi. Simulyatsion dasturlar (SUMO) va loyihaviy yondashuv ta'lim samaradorligini tubdan oshiradi.

2. Muammoli ta'lim (PBL) va STEM yondashuvini birlashtirish talabalarda nazariy bilimlarni amaliyot bilan bog'lash, datchiklar ma'lumotlarini tahlil qilish va algoritmik qarorlar qabul qilish kompetensiyasini shakllantiradi.

Oliy va professional ta'lim muassasalari uchun amaliy pedagogik tavsiyalar:

• Texnik oliy o'quv yurtlarida 'Aqlli shaharlar va Aqlli Transport Tizimlari (ITS)' bo'yicha maxsus raqamli simulyatsiya va IoT laboratoriyalarini tashkil etish;

• Fan dasturlariga SUMO, VISSIM kabi ochiq kodli transport simulyatsiyasi dasturlari bo'yicha amaliy modullarni kiritish;

• Talabalarning yakuniy malakaviy ish va diplom loyihalarida real shahar chorrahalarining raqamli egizagini (Digital Twin) yaratish va datchiklar monitoringini loyihalash topshiriqlarini kengroq tatbiq etish.

ADABIYOTLAR RO‘YXATI

1. Saidov, M. X., & Jo'rayev, T. R. (2023). Muhandislik pedagogikasi va raqamli ta'lim texnologiyalari. Toshkent: O'zbekiston faylasuflari milliy jamiyati nashriyoti.

2. Prince, M. (2004). Does active learning work? A review of the research. Journal of Engineering Education, 93(3), 223-231.

3. Lopez, P. A., et al. (2018). Microscopic Traffic Simulation using SUMO. The 21st International Conference on Intelligent Transportation Systems (ITSC), IEEE. O‘zbekiston Respublikasi Prezidentining 2022-yil 28-yanvardagi PQ-60-son "Yangi O'zbekistonning 2022-2026 yillarga mo'ljallangan taraqqiyot strategiyasi to'g'risida"gi Farmoni.

TABIIY FANLARNI O‘QITISHDA 5-SINF O‘QUVCHILARI UCHUN LOYIHA ISHLARINI TASHKIL ETISH METODIKASI

Boymatov Bekzod Xidirboyevich

Chirchiq Davlat pedagogika universitetining mustaqil tadqiqotchisi.

Toshkent viloyati Pedagogik mahorat markazi

“Aniq va tabiiy fanlar metodikasi” kafedrasi katta o‘qituvchisi,

boymatov900@gmail.com

Annotatsiya: *Mazkur maqolada umumiy o‘rta ta’lim maktablarining 5-sinf o‘quvchilari uchun loyiha ishlarini tanlash mezonlari, loyiha faoliyatining bosqichlari, o‘qituvchi va o‘quvchi faoliyati, loyiha mavzularining tabiiy fanlar mazmuni bilan integratsiyasi hamda loyiha natijalarini baholash mezonlari taklif etilgan.*

Kalit so‘zlar: *O‘quv-loyiha faoliyati, amaliy faoliyat, tadqiqotchilik, ijodkorlik, shaxsga yo‘naltirilgan ta’lim, kompetensiyaviy yondashuv.*

Annotation: *This article proposes criteria for selecting project work for 5th grade students of general secondary schools, stages of project activity, teacher and student activities, integration of project topics with the content of natural sciences, and criteria for evaluating project results.*

Keywords: *Educational-project activity, practical activity, research, creativity, student-centered education, competency-based approach.*

KIRISH

Bugungi kunda umumiy o‘rta ta’lim tizimida o‘quvchilarning faqat tayyor bilimlarni o‘zlashtirishi bilan cheklanib qolmasdan, egallagan bilimlarini amaliy vaziyatlarda qo‘llashi, mustaqil fikrlashi, muammoli vaziyatlarni tahlil qilishi, dalillar asosida xulosa chiqarishi va o‘z faoliyati natijasini baholay olishi muhim pedagogik vazifalardan biri sifatida namoyon bo‘lmoqda. Ayniqsa, tabiiy fanlarni o‘qitishda bunday faoliyatning ahamiyati yuqori bo‘lib, o‘quvchilarning tabiiy hodisalarni kuzatishi,

tajribalar o‘tkazishi, ma’lumotlarni tahlil qilishi va amaliy xulosalar chiqarishi fan mazmunini chuqurroq o‘zlashtirish imkonini beradi.

Loyiha faoliyatining muhim jihati shundaki, bunda o‘quvchi ta’lim jarayonining bevosita faol ishtirokchisiga aylanadi. U muammoni aniqlash, savol qo‘yish, ma’lumot izlash, kuzatish yoki tajriba o‘tkazish, natijalarni tahlil qilish, xulosa chiqarish va yakuniy mahsulot yaratish jarayonlarida faol ishtirok etadi. Shu bilan birga, loyiha asosida o‘qitishning samaradorligini faqat loyiha yakunida yaratilgan mahsulot bilan baholash yetarli emas. O‘quvchining loyiha jarayonidagi faoliyati, mustaqil izlanishi, hamkorlik qilishi, ma’lumotlarni qayta ishlashi va o‘z faoliyatini baholashi ham hisobga olinishi lozim. Loyiha faoliyatining natijalarini baholashga bag‘ishlangan tadqiqotlarda bilim, ko‘nikma, faollik, motivatsiya va loyiha mahsuloti kabi turli ko‘rsatkichlardan foydalanilganligi qayd etiladi.

5-sinf “Tabiiy fanlar” darslarida loyiha faoliyatini tashkil etish uchun keng pedagogik imkoniyatlarga ega. Mazkur fan orqali o‘quvchilar tabiat obyektlari va hodisalarini kuzatish, ularning o‘zaro bog‘liqligini aniqlash, oddiy tajribalarni amalga oshirish, tabiiy jarayonlarni tushuntirish va olingan bilimlarni kundalik hayot bilan bog‘lash imkoniyatiga ega bo‘ladilar. “Tabiiy fanlar” mazmunini loyiha faoliyati bilan uyg‘unlashtirish o‘quvchilarning tabiiy-ilmiy bilimlarini amaliy faoliyat orqali mustahkamlashga xizmat qiladi. Bunda loyiha ishlarini tashkil etishda o‘quvchining mustaqil faoliyati bilan o‘qituvchining metodik rahbarligi o‘rtasidagi muvozanatni ta’minlash alohida ahamiyatga ega. O‘qituvchi loyiha mavzusini belgilashda, muammoli vaziyatni shakllantirishda, tadqiqot savolini aniqlashtirishda, faoliyat bosqichlarini rejalashtirishda va natijalarni baholashda yo‘naltiruvchi vazifani bajaradi. O‘quvchi esa izlanish, kuzatish, tajriba, tahlil va mahsulot yaratish orqali loyihaning asosiy faol subyekti sifatida ishtirok etadi.

ASOSIY QISM

Mazkur tadqiqotning metodologik asosini o‘quvchini ta’lim jarayonining faol subyekti sifatida qarashga asoslangan shaxsga yo‘naltirilgan, faoliyatga yo‘naltirilgan va kompetensiyaviy yondashuvlar tashkil etadi. Loyiha asosida o‘qitishda o‘quvchi tayyor bilimlarni o‘zlashtiruvchi subyekt sifatida emas, balki muammoni aniqlash, ma’lumotlarni izlash, ularni qayta ishlash, amaliy faoliyatni bajarish va olingan natijalarni taqdim etishda faol ishtirok etuvchi ta’lim subyekti sifatida namoyon bo‘ladi. Loyiha asosida o‘qitishning aynan shu xususiyati uning an’anaviy o‘qitishdan farqlovchi muhim jihatlaridan biri hisoblanadi [1; 2–4-b.].

Tadqiqotda loyiha asosida o‘qitish o‘quvchilarning muayyan muammo yoki savolga javob izlash, mustaqil yoki hamkorlikda faoliyat olib borish, turli axborot manbalaridan foydalanish, amaliy topshiriqlarni bajarish va yakuniy mahsulot yaratishiga asoslangan metodik tizim sifatida talqin qilindi. Balemen va Özer Keskin tomonidan tabiiy fanlar ta’limiga oid 48 ta tadqiqot asosida amalga oshirilgan meta-tahlil loyiha asosida o‘qitishning tabiiy fanlar, fizika, kimyo va biologiya ta’limidagi o‘quv natijalariga ijobiy ta’sirini ko‘rsatgan. Tadqiqotda loyiha asosida o‘qitishning umumiy ta’sir hajmi 1,063 ga tengligi aniqlangan [2; 849–865-b.].

Tadqiqotning metodologik yo‘nalishini belgilashda loyiha faoliyatining bosqichma-bosqich va maqsadli tashkil etilishi muhim mezon sifatida qabul qilindi. Bunda loyiha faoliyati alohida topshiriq emas, balki muammoni aniqlashdan boshlab natijani taqdim etish va baholashgacha bo‘lgan o‘zaro bog‘liq jarayonlar tizimi sifatida qaraldi. Ferrero, Vadillo va Leónning tizimli sharhida loyiha asosida o‘qitishning samaradorligi o‘quvchilarning yosh xususiyatlari, loyiha jarayonining qanday tashkil etilgani, o‘qituvchi va o‘quvchiga qo‘yiladigan talablar hamda metodning asosiy elementlariga rioya etilishi bilan bog‘liqligi ko‘rsatilgan [3; 1–4-b.].

Shu asosda 5-sinf “Tabiiy fanlar” fanida loyiha ishlarini tashkil etishning metodik jarayoni quyidagi ketma-ketlik asosida belgilandi:

muammoli vaziyat → loyiha mavzusini tanlash → tadqiqot savolini shakllantirish → faraz ilgari surish → ish rejasini tuzish → axborot to‘plash → kuzatish yoki tajriba o‘tkazish → natijalarni qayta ishlash va tahlil qilish → loyiha mahsulotini yaratish → taqdimot va himoya → refleksiya va baholash.

Mazkur ketma-ketlikda har bir bosqich o‘quvchining keyingi faoliyatini tayyorlashga xizmat qiladi. Dastlab o‘quvchi muammoli vaziyatni anglaydi va tadqiqot savolini shakllantiradi. Keyingi bosqichda zarur ma’lumotlarni izlaydi, kuzatish yoki tajriba o‘tkazadi, olingan ma’lumotlarni taqqoslaydi va tahlil qiladi. Yakunda esa o‘z xulosalarini loyiha mahsuloti hamda taqdimot shaklida ifodalaydi. Bunday tashkil etish o‘quvchining bilimni faqat o‘zlashtirishi emas, balki undan amaliy faoliyatda foydalanishini ta’minlaydi [4; 849–865-b.].

Tadqiqotning obyekti sifatida 5-sinf “Tabiiy fanlar” fanini o‘qitish jarayonida o‘quv-loyiha faoliyatini tashkil etish jarayoni, predmeti sifatida esa o‘quvchilarning loyiha faoliyatini tashkil etishning mazmuni, shakllari, metodlari, bosqichlari va baholash mezonlari belgilandi.

Tadqiqot maqsadidan kelib chiqib quyidagi metodlardan foydalanildi: nazariy tahlil, pedagogik kuzatish, suhbat, taqqoslash, umumlashtirish, pedagogik modellashtirish, o‘quvchilarning loyiha mahsulotlarini tahlil qilish va pedagogik tajribani o‘rganish. Loyiha jarayonining asosiy elementlari va o‘qituvchi hamda o‘quvchi faoliyatining yetarli darajada tavsiflanishi muhimligini ta’kidlaydi [5; 4–6-b.].

Pedagogik kuzatish metodi 5-sinf o‘quvchilarining loyiha faoliyatidagi ishtirokini aniqlashga qaratildi. Kuzatish davomida o‘quvchilarning muammoni anglash, savol qo‘yish, mustaqil ma’lumot izlash, guruh bilan

hamkorlik qilish, kuzatish va tajriba natijalarini qayd etish hamda xulosa chiqarish faoliyatlariga e’tibor qaratildi.

Suhbat metodi orqali o‘quvchilarning loyiha mavzusiga qiziqishi, loyiha topshiriqlarini bajarish jarayonida duch kelgan qiyinchiliklari, guruhdagi hamkorligi va loyiha natijasiga bo‘lgan munosabati aniqlandi. Mazkur metod o‘quvchilarning loyiha faoliyatini faqat tashqi natijalar orqali emas, balki ularning subyektiv munosabati va faoliyatga jalb etilish darajasi orqali ham baholash imkonini berdi.

Taqqoslash metodidan loyiha asosida tashkil etilgan ta’lim faoliyati bilan an’anaviy dars jarayonining ayrim metodik jihatlarini qiyoslashda foydalanildi. Bunda o‘quvchilarning mustaqil faoliyati, amaliy topshiriqlarni bajarishi, hamkorlikdagi faoliyati, bilimlarni amaliy vaziyatlarda qo‘llashi va yakuniy natijani taqdim etishi kabi ko‘rsatkichlarga e’tibor qaratildi.

Modellashtirish metodi asosida 5-sinf “Tabiiy fanlar” fanida loyiha ishlarini tashkil etishning metodik modeli ishlab chiqildi. Model maqsadli, mazmunli, jarayonli va natijaviy qismlarning o‘zaro bog‘liqligiga asoslandi. Maqsadli qism loyiha faoliyatining pedagogik maqsadini, mazmunli qism loyiha mavzulari va topshiriqlarini, jarayonli qism loyiha faoliyatining bosqichlarini, natijaviy qism esa kutilayotgan ta’limiy natijalarni qamrab oladi.

5-sinf o‘quvchilarining yosh xususiyatlarini hisobga olish tadqiqot metodologiyasining muhim shartlaridan biri sifatida belgilandi. Loyiha topshiriqlarini tanlashda ularning murakkablik darajasi, bajarish muddati, zarur resurslar, mustaqil ishlash imkoniyati va o‘quvchining kundalik hayoti bilan bog‘liqligiga alohida e’tibor berildi. Boshlang‘ich va quyi maktab bosqichidagi loyiha ta’limiga oid tizimli tahlil natijalari ham mazkur bosqichda loyiha faoliyatining metodik jihatdan aniq tashkil etilishi muhimligini ko‘rsatadi [6; 1–4-b.].

Loyiha mavzularini tanlashda quyidagi metodik mezonlarga amal qilindi:

Fan mazmuniga moslik — loyiha mavzusi “Tabiiy fanlar” o‘quv mazmuni bilan bevosita bog‘langan bo‘lishi;

Yoshga moslik — topshiriq 5-sinf o‘quvchisining bilim, ko‘nikma va mustaqil faoliyat imkoniyatlariga mos kelishi;

Amaliy yo‘nalganlik — loyiha real hayotdagi muammo yoki vaziyat bilan bog‘lanishi;

Tadqiqotchilik imkoniyati — o‘quvchi kuzatish, tajriba, ma’lumot to‘plash va tahlil qilish imkoniyatiga ega bo‘lishi;

Ijodiy mahsulot — loyiha yakunida poster, model, maket, jadval, xarita, taqdimot yoki boshqa amaliy mahsulot yaratilishi;

Hamkorlik imkoniyati — loyiha individual yoki guruhli faoliyatni tashkil etishga imkon berishi;

Refleksiya imkoniyati — o‘quvchi o‘z faoliyati va natijasini tahlil qila olishi.

Loyiha faoliyatining natijalarini baholashda faqat yakuniy mahsulot emas, balki loyiha jarayonining o‘zi ham baholanishi nazarda tutildi. Bunda o‘quvchining muammoni tushunishi, ma’lumot izlashdagi mustaqilligi, amaliy faoliyatni bajarishi, guruhdagi hamkorligi, natijalarni tahlil qilishi, xulosa chiqarishi va loyiha mahsulotini taqdim etishi asosiy ko‘rsatkichlar sifatida belgilandi. Bunday yondashuv loyiha faoliyatini faqat “tayyor mahsulot” bilan baholashning oldini olib, o‘quvchining butun faoliyat jarayonini hisobga olish imkonini beradi.

XULOSA

Tadqiqot davomida biz 5-sinf “Tabiiy fanlar” ta’limida o‘quvchilarning loyiha faoliyatini tashkil etish metodikasini ishlab chiqish va uni amaliyotda qo‘llashga alohida e’tibor qaratdik. Bizning fikrimizcha, 5-sinf o‘quvchilari uchun loyiha ishlarini tashkil etishda asosiy e’tibor tayyor

bilimni o‘zlashtirishga emas, balki o‘quvchini kuzatish, savol berish, muammoni aniqlash, ma’lumot izlash, tajriba o‘tkazish, natijani tahlil qilish va o‘z xulosasini ifodalashga yo‘naltirilishi lozim.

Tadqiqot natijasida 5-sinf o‘quvchilari uchun loyiha ishlarini tashkil etishning quyidagi metodik ketma-ketligi ishlab chiqildi:

muammoli vaziyat → loyiha mavzusini aniqlash → tadqiqot savolini belgilash → faraz ilgari surish → ish rejasini tuzish → ma’lumotlarni yig‘ish → kuzatish va tajriba o‘tkazish → natijalarni tahlil qilish → loyiha mahsulotini yaratish → taqdimot va himoya → refleksiya va baholash.

Biz ishlab chiqqan metodikada loyiha faoliyati faqat yakuniy mahsulot yaratish bilan cheklanmaydi. Unda o‘quvchining butun faoliyat jarayoni muhim hisoblanadi. Shu sababli natijalarni baholashda muammoni tushunish, mustaqil izlanish, amaliy faoliyat, ma’lumotlarni tahlil qilish, hamkorlik, ijodkorlik, taqdimot qilish va refleksiya kabi mezonlardan foydalanish maqsadga muvofiq deb topildi.

Bizning kuzatishlarimizga ko‘ra, loyiha ishlarida yakuniy mahsulotning mavjudligi ham o‘quvchilarning faol ishtirokini kuchaytiruvchi omillardan biri bo‘ldi. O‘quvchi o‘z faoliyati natijasida plakat, jadval, model, kuzatuv kundaligi, taqdimot, tavsiyalar to‘plami yoki boshqa ijodiy mahsulot yaratishi orqali o‘z bilimining amaliy qiymatini anglay boshlaydi.

Loyiha faoliyatining samaradorligini faqat o‘quvchining yakuniy bahosi bilan aniqlash yetarli emas. Uning haqiqiy pedagogik qiymati o‘quvchining savol qo‘yishi, mustaqil izlanishi, kuzatishi, tajriba o‘tkazishi, ma’lumotni tahlil qilishi, o‘z fikrini asoslay olishi va faoliyatini refleksiv baholashi orqali namoyon bo‘ladi. Shu sababli 5-sinf “Tabiiy fanlar” darslarida loyiha ishlarini tizimli tashkil etish o‘quvchilarning tabiiy-ilmiy bilimlarini amaliy faoliyat bilan bog‘lash va ularning tadqiqotchilik

kompetensiyalarini rivojlantirishning istiqbolli metodik yo‘nalishi sifatida baholanishi mumkin.

FOYDALANILGAN ADABIYOTLAR:

1. Ferrero M., Vadillo M.A., León S.P. Is project-based learning effective among kindergarten and elementary students? A systematic review. PLOS ONE. 2021. Vol. 16, No. 4. e0249627. DOI: 10.1371/journal.pone.0249627.

2. Balemen N., Özer Keskin M. The effectiveness of Project-based learning on science education: A meta-analysis search // International online journal of education and teaching. 2018. Vol. 5, No. 4. P. 849–865.

3. Almulla M.A. The effectiveness of the project-based learning approach as a way to engage students in learning. SAGE open, 2020, 10(3).

4. Pangestu K., Malagola Y., Robbaniyah I., Rahajeng D. The influence of project based learning on learning outcomes, creativity and student motivation in science learning at elementary schools. Jurnal prima edukasia, 2024, 12(2).

5. Zahra P., Rahmiati R. Investigating the effect of project-based learning on the science learning outcomes of fifth grade students in elementary school. journal of educational sciences, 2025, 9(4), 3007–3018.

6. Alda A., Sundahry S., Agrita T.W. Project-based learning improves process and outcomes of grade 5 science learning. indonesian journal of innovation studies, 2025, 26(4).

7. Rizalia S., Raehang R., Rasmina R., Sulaiman S. Project-based learning: a catalyst for enhancing students' interest and science learning outcomes on animal life cycles topic. journal of science learning, 2025, 8(3).

PEDAGOGICAL ADAPTATION OF CHINA'S ABACUS-BASED MENTAL ARITHMETIC EXPERIENCE FOR DEVELOPING PRIMARY PUPILS' CREATIVE COMPETENCE IN UZBEKISTAN

O'. B. O'rolova

Doctoral researcher, A. Avloniy National Institute of Pedagogical Excellence, Uzbekistan

E-mail: urolovaugiloy7@gmail.com

Abstract. *This article examines how China's abacus-based mental arithmetic experience can be pedagogically adapted to develop primary pupils' creative competence in Uzbekistan. A targeted narrative review and comparative pedagogical analysis were used. Chinese studies provide evidence mainly for visuospatial working memory, executive functions and perceptual processing, whereas direct evidence for creative competence remains limited. The article proposes an adaptation framework that combines staged abacus visualization with open-ended tasks, alternative strategies, reflection and motivation. The framework is presented as a testable pedagogical proposition rather than a confirmed causal effect.*

Keywords: *primary education; creative competence; mental arithmetic technology; abacus visualization; divergent thinking; pedagogical adaptation; China; Uzbekistan.*

INTRADUCTION

Creative competence has become an important educational outcome because pupils must generate ideas, consider alternatives, refine solutions and evaluate their own thinking. In this article, creative competence is treated as an integrated quality with four interrelated components: motivational, cognitive, operational-activity and reflective. Its observable indicators include fluency, flexibility, originality and elaboration (Guilford, 1950; Torrance, 1962). This distinction is important because creativity is broader than rapid performance or accurate reproduction of a learned procedure.

Abacus-based mental arithmetic is considered here as a pedagogical technology built on staged action, visualization, concentration and internal representation. Chinese research is especially relevant because it has examined long-term abacus training, executive functions, visuospatial working memory and perceptual processing in children (Wang et al., 2017; Wang et al., 2019; Wang et al., 2022). However, cognitive improvement must not be automatically interpreted as growth in creative competence. The purpose of this study is therefore to identify what the Chinese evidence actually supports and to formulate a pedagogically grounded adaptation for Uzbek primary education.

The study used a targeted narrative review and comparative pedagogical analysis. Sources were selected when they met at least one of three criteria: they reported empirical evidence on abacus-based mental arithmetic among children; they examined creativity or creative thinking through recognized indicators; or they supported interpretation of working memory and executive functions. The evidence was coded according to the four components of creative competence. Each claim was classified as direct evidence, indirect evidence or an identified research need. This was not a systematic review, and the search was not registered in a review protocol. Consequently, the conclusions are analytical and hypothesis-generating rather than exhaustive.

The reviewed Chinese studies support a clear developmental sequence. Pupils first act on a physical abacus, then reproduce the actions through guided visualization and finger movement, and finally operate with an internal image. This sequence can strengthen the coordination of attention, visual representation and controlled action. Longitudinal and neurocognitive studies reported differences in executive-function performance and neural correlates, as well as gains in visuospatial working memory and early perceptual processing (Wang et al., 2017; Wang et al., 2019; Wang et al.,

2022). A broader review reached a similar conclusion but emphasized that transfer beyond trained abilities requires careful interpretation (Wang, 2020).

These findings relate most directly to the cognitive and operational-activity components of creative competence. They do not by themselves demonstrate fluency, flexibility, originality or elaboration. One randomized trial outside China reported improvement on the CREA measure after an eight-week abacus intervention (León et al., 2021). Yet CREA primarily captures the production of questions from a visual stimulus, and the short intervention and control conditions limit generalization. Therefore, the claim that mental arithmetic independently develops creative competence would exceed the available evidence.

Table 1. Evidence-based adaptation of China's experience

Component	Evidence from China	Pedagogical adaptation	Research need
Motivational	Not directly measured in the reviewed Chinese studies	Choice, achievable challenge and pupil-generated goals	Measure interest, persistence and task value
Cognitive	Evidence for visuospatial working memory, attention control and executive functions	Use visualization as a resource for generating and comparing ideas	Test whether cognitive change predicts creative indicators
Operational-activity	Staged movement from physical action to internal image	Add open tasks with several strategies and products	Compare routine practice with creativity-enriched practice
Reflective	Not directly measured	Require explanation, self-assessment and strategy revision	Assess reflection with age-appropriate rubrics

Source: developed by the author from the reviewed evidence.

The pedagogical value of the Chinese experience lies in its carefully staged visualization practice, not in speed as an end in itself. For creative competence, routine exercises must be supplemented with tasks that allow several approaches, pupil-created conditions, explanation of choices and improvement of an initial idea. A pupil may visualize an abacus pattern, propose more than one transformation, describe the strategy verbally, compare it with peers' approaches and revise the solution. Such work

connects visualization with fluency, flexibility, originality, elaboration and reflection.

For Uzbekistan, the proposed model has four linked stages. The first stage develops confident action with the physical abacus. The second stage strengthens visual representation. The third stage introduces open-ended and variable tasks. The fourth stage requires reflection through explanation, self-assessment and strategy revision. Motivation should be supported throughout through meaningful choice, collaborative inquiry and age-appropriate challenge. The model does not assume that cognitive training automatically transfers to creativity. Instead, transfer is deliberately designed through creative task conditions.

The model should be tested through a controlled pre-test and post-test design. At minimum, one group should receive mental arithmetic enriched with creative tasks, while a comparison group follows the usual instructional programme. Outcomes should include the four divergent-thinking indicators and age-appropriate measures of motivation and reflection. Working-memory or attention measures may be included as explanatory variables, but they should not replace direct assessment of creative competence. This design would show whether the proposed pedagogical integration produces an effect beyond routine practice.

China’s experience provides a strong procedural basis for abacus visualization and credible evidence concerning selected cognitive processes. It does not yet provide sufficient direct evidence that mental arithmetic alone develops primary pupils’ creative competence. The scientifically defensible approach is to adapt the staged Chinese practice by adding open-ended tasks, alternative strategies, pupil choice and reflection, then test the resulting model empirically in Uzbekistan. The proposed framework clarifies the mechanism, identifies measurable outcomes and prevents cognitive gains from being misreported as confirmed creativity effects.

REFERENCES

1. Amabile, T. M. (1996). Creativity in context. Westview Press.
2. Baddeley, A. (2012). Working memory: Theories, models, and controversies. Annual Review of Psychology, 63, 1-29. https://doi.org/10.1146/annurev-psych-120710-100422
3. Guilford, J. P. (1950). Creativity. American Psychologist, 5(9), 444-454. https://doi.org/10.1037/h0063487
4. León, S. P., Carcelén Fraile, M. C., & García-Martínez, I. (2021). Development of cognitive abilities through the abacus in primary education students: A randomized controlled clinical trial. Education Sciences, 11(2), 83. https://doi.org/10.3390/educsci11020083
5. OECD. (2024). PISA 2022 results (Volume III): Creative minds, creative schools. OECD Publishing. https://doi.org/10.1787/765ee8c2-en
6. Torrance, E. P. (1962). Guiding creative talent. Prentice-Hall.
7. Wang, C. (2020). A review of the effects of abacus training on cognitive functions and neural systems in humans. Frontiers in Neuroscience, 14, 913. https://doi.org/10.3389/fnins.2020.00913
8. Wang, C., Weng, J., Yao, Y., Dong, S., Liu, Y., & Chen, F. (2017). Effect of abacus training on executive function development and underlying neural correlates in Chinese children. Human Brain Mapping, 38(10), 5234–5249. https://doi.org/10.1002/hbm.23728
9. Wang, C., Xu, T., Geng, F., Hu, Y., Wang, Y., Liu, H., & Chen, F. (2019). Training on abacus-based mental calculation enhances visuospatial working memory in children. Journal of Neuroscience, 39(33), 6439–6448. https://doi.org/10.1523/JNEUROSCI.3195-18.2019
10. Wang, D., Zhu, K., Cui, J., & Wen, J. (2022). Early event-related potential during figure and object perception of abacus mental calculation training children: A randomized controlled trial. Frontiers in Behavioral Neuroscience, 16, 823068. https://doi.org/10.3389/fnbeh.2022.823068

METHODOLOGICAL POSSIBILITIES FOR DEVELOPING STUDENTS' COMPETENCE IN WORKING WITH HISTORICAL EVIDENCE IN HISTORY LESSONS

Nurmetova Muhayyo Matlatibovna

Educator-researcher

muhayyonurmetova950@gmail.com

ORCID: 0009-0006-1502-2335

Abstract. *This paper systematizes the methodological possibilities for developing students' competence in working with historical evidence during history lessons. A five-stage learning cycle is proposed, based on identifying sources, contextualization, comparative verification, and formulating evidence-based conclusions. The didactic functions of problem-based tasks, multiple perspectives, digital tools, and formative assessment are discussed, alongside criteria for assessing this competence.*

Keywords: *history education, historical evidence, historical source, competence, source criticism, contextualization, comparative analysis, evidence-based conclusion, formative assessment.*

INTRODUCTION

The outcome of modern history education is not determined solely by a student's ability to recall dates and events. A crucial result is the ability to move beyond accepting information about the past as a ready-made truth; instead, it involves verifying the evidentiary basis, considering the circumstances of a source's creation, and formulating well-founded judgments based on multiple pieces of evidence. The Law of the Republic of Uzbekistan "On Education" defines education as a systematic process aimed at equipping individuals with deep theoretical knowledge, competencies, and practical skills, as well as developing their abilities [1]. This approach

necessitates integrating subject-specific historical knowledge with investigative practices.

Historical evidence is information conveyed through a source and interpreted within the framework of a specific question. Information contained in a source serves as the basis for a sound conclusion only when its author, date, intended audience, purpose, and relationship to other sources have been established. S. Wineburg highlights the importance of examining a source's origins, considering the context, and cross-verifying information when reading historical texts [2].

The aim of the study is to identify opportunities for developing the competence to work with historical evidence, integrate these into a cohesive instructional cycle, and outline assessment criteria. The study employed methods of analysis, comparison, systematization, and modeling.

STRUCTURE OF THE COMPETENCE IN WORKING WITH HISTORICAL EVIDENCE

The competence in working with historical evidence is an integrative ability involving the selection and critical analysis of sources, their comparison, and the drawing of coherent conclusions to answer a historical question. J. Van Drie and C. Van Boxtel link historical reasoning to questioning, the use of sources, contextualization, argumentation, and the application of historical concepts [3]. This framework allows for the identification of the following components of the competence:

1. *Information-analytical component* — identifying the source type, author, time of creation, intended audience, and communicative purpose;

2. *Contextual component* — linking the evidence to the political, social, economic, and cultural conditions of the relevant period;

3. *Verification component* — comparing claims within the source against other independent sources and explaining reasons for consistencies or discrepancies;

4. *Argumentative component* — establishing a logical connection between the thesis, evidence, and explanation to formulate a well-grounded written or oral conclusion;

5. *Reflexive component* — recognizing the degree of reliability of the conclusion, the limitations of the evidence, and the possibility of alternative interpretations.

These components guide the student beyond merely repeating the ideas found in a source to examining the context of its creation—specifically, for whom and under what circumstances it was produced. P.Seixas and T.Morton view evidence in relation to historical significance, change, cause and consequence, and historical perspective [4].

METHODOLOGICAL OPPORTUNITIES FOR DEVELOPING COMPETENCE

The first opportunity lies in designing the lesson based on the "set of sources" principle. Official documents, personal accounts, press excerpts, maps, photographs, and statistical tables should all shed light on a single question from diverse perspectives. Even when the material is abridged, details regarding the author, date, place of origin, and genre are preserved.

The second option involves problem-based inquiry tasks. Instead of simply repeating a ready-made answer, students are presented with an open-ended question that requires them to evaluate evidence. For instance, when examining the impact of the Jadid movement on societal modernization using press articles, school charters, memoirs, and visual sources, groups compile a collective table of evidence.

The third option focuses on multiple perspectives and comparative analysis. Students do not merely choose between conflicting accounts; instead, they identify the reasons for the discrepancies based on the sources and assess which claim is more strongly supported by evidence. This

approach fosters an understanding of the historical context and enables the analysis of viewpoints based on evidentiary criteria.

The fourth opportunity lies in the purposeful use of graphic and digital tools. Tools such as the "**Author–Purpose–Audience–Claim–Evidence**" chart, timelines, and cause-and-effect maps make complex information visible. When using digital materials, the author, publication date, and link to the original source are verified.

The fifth opportunity is the teacher's step-by-step support. Initially, the teacher demonstrates the source analysis process aloud: examining the title and metadata, formulating hypotheses, identifying unfamiliar terms, and distinguishing claims from evidence. In the next stage, students work in pairs using guiding questions; subsequently, the scaffolding is reduced as they transition to independent analysis. This sequence—modeling, collaborative practice, and independent execution—transforms a complex cognitive process into an observable learning activity.

FIVE-STAGE METHODOLOGICAL CYCLE

Working with historical evidence is organized through the following five-stage methodological cycle:

1. Identifying evidence. The student isolates information relevant to the question and distinguishes their own interpretation from the observed features.

2. Characterizing the source. The author, time, place, genre, audience, and purpose of creation are examined to determine the source's potential and limitations.

3. Placing in context. The concept or event within the source is linked to the conditions of that era.

4. Comparative analysis. Information from at least two sources is compared to identify commonalities, differences, and mutual corroboration.

5. Substantiated conclusion. The student supports a thesis with multiple sources and acknowledges the limitations of the conclusion.

The cycle guides the student from merely repeating ready-made answers to constructing knowledge based on evidence. Document-based lessons enable the teaching of historical reading strategies in conjunction with subject matter [5].

ASSESSMENT CRITERIA AND PEDAGOGICAL CONDITIONS

In the assessment, the thought process is taken into account alongside the final answer. Each criterion is scored on a scale of 0 to 3 points: 0 — not completed; 1 — completed with assistance; 2 — largely correct; 3 — completed independently and with sound reasoning.

Criterion	Observed movement	High-level description
Source identification	It indicates the author, time, genre, audience, and purpose.	It clearly defines the attributes and explains their impact on the content.
Contextual analysis	It links the source to the conditions of the era.	Interprets the evidence without anachronism and soundly selects relevant historical factors.
Comparative verification	It identifies similarities and differences across multiple sources.	It explains the reason for the discrepancy through the origins and purpose of the sources.
Argumentation	It establishes a connection between the thesis, the evidence, and the explanation.	Formulates a coherent conclusion based on at least two sources and takes counter-arguments into account.

Criterion	Observed movement	High-level description
Reflection	Evaluates the reliability and limitations of the conclusion.	It points out the missing evidence and substantiates the plausibility of an alternative interpretation.

Presenting the rubric to students at the beginning of the lesson makes the assessment criteria transparent. Before submitting their conclusions, students can self-assess by asking questions such as: “Did I take the source's author into account?”, “To what extent do the pieces of evidence corroborate one another?”, and “What are the limitations of my conclusion?” Meanwhile, instead of assigning a generic grade like “good” or “insufficient,” the teacher provides specific feedback—for instance, noting that “evidence was selected, but its connection to the thesis was not explained”.

The effectiveness of this methodology depends on several pedagogical conditions. First, assignments should progress in complexity, moving from identifying basic details to evaluating conflicting arguments. Second, while the language of historical texts may be adapted to the students' age, the substantive integrity of the source must be preserved. Third, an incorrect answer should be viewed not as grounds for punishment, but as a means to identify a gap in reasoning. Fourth, individual writing, paired analysis, and group discussion should be effectively integrated. Fifth, the teacher must verify the origin and reliability of the materials beforehand.

DISCUSSION

In a lesson based on working with historical evidence, the teacher's role shifts from a mere conveyor of information to a specialist who designs student inquiry and guides the thinking process. The textbook serves as a foundational text that engages in a dialogue with other sources. K. Barton and L. Levstik link history education to making reasoned judgments and

participating responsibly in social life [6]. Thus, evidence-based reasoning is a crucial prerequisite for both a critical approach to information and civic responsibility.

CONCLUSION

The theoretical and methodological analysis conducted led to the following conclusions:

1. The competence to work with historical evidence is an integrative learning outcome that combines source identification, contextualization, comparative analysis, argumentation, and reflection;

2. To develop this competence, historical sources must be used not merely as illustrative supplements, but as tools for constructing answers to inquiry-based questions;

3. Methodological effectiveness increases when a combination of sources, multiple perspectives, graphic organizers, digital resources, scaffolded pedagogical support, and formative assessment are employed in an interconnected manner;

4.The proposed five-stage cycle enables the systematic organization of the thinking process during the lesson—ranging from locating evidence to formulating a substantiated conclusion with a clear understanding of its limitations;

5. An analytical rubric serves not only to evaluate the student's answer but also to assess the processes of working with sources, provide specific feedback, and determine a path for individual development.

As a result, the history lesson shifts from a forum for merely recounting facts to an environment for verifying evidence, comparing perspectives, and drawing well-founded conclusions. Moving forward, it is advisable to pilot the proposed methodological cycle across various grade levels and topics, determine its effectiveness through initial and final assessments, and explore opportunities for its interdisciplinary application.

REFERENCES USED

1. Law of the Republic of Uzbekistan "On Education". ORQ-637, September 23, 2020. URL: https://lex.uz/docs/-5013007 (access date: 19.09.2026).

2. Wineburg, S. S. On the Reading of Historical Texts: Notes on the Breach Between School and Academy // American Educational Research Journal. 1991. Vol. 28, No. 3. P. 495–519. DOI: https://doi.org/10.3102/00028312028003495.

3. Van Drie, J., van Boxtel, C. Historical Reasoning: Towards a Framework for Analyzing Students' Reasoning about the Past // Educational Psychology Review. 2008. Vol. 20. P. 87–110. DOI: https://doi.org/10.1007/s10648-007-9056-1.

4. Seixas, P., Morton, T. The Big Six Historical Thinking Concepts. Toronto: Nelson Education, 2013. 218 p. ISBN 978-0-17-654154-5. URL: https://www.amazon.com/dp/0176541543 (date accessed: 09/19/2026).

5. Reisman, A. Reading Like a Historian: A Document-Based History Curriculum Intervention in Urban High Schools // Cognition and Instruction. 2012. Vol. 30, No. 1. P. 86–112. DOI: https://doi.org/10.1080/07370008.2011.634081.

6. Barton, K. C., Levstick, L. S. Teaching History for the Common Good. Mahwah, NJ: Erlbaum, 2004. DOI: https://doi.org/10.4324/9781410610508

BO‘LAJAK O‘QITUVCHILARDA PEDAGOGIK TAJRIBANI BILIMGA AYLANTIRISH KOMPETENTLIGINING MAZMUNI, TUZILMASI VA KOMPONENTLARI

Sultonova Mahlyoxon Jo‘raboy qizi

Farg‘ona davlat universiteti mustaqil izlanuvchisi

Annotatsiya. *Mazkur maqolada bo‘lajak o‘qituvchilarda pedagogik tajribani bilimga aylantirish kompetentligining pedagogik mohiyati, mazmuni va strukturaviy tarkibi nazariy jihatdan asoslangan. Pedagogik tajribaning o‘z-o‘zidan kasbiy bilimga aylanmasligi, buning uchun tajribani refleksiv tahlil qilish, sabab-oqibat munosabatlarini aniqlash, pedagogik nazariya bilan bog‘lash, konseptuallashtirish va yangi vaziyatlarga transfer qilish zarurligi ko‘rsatib berilgan. “Pedagogik tajribani bilimga aylantirish kompetentligi” tushunchasiga mualliflik ta’rifi berilib, uning motivatsion-qadriyatli, refleksiv-analitik, kognitiv-konseptual, transformativ-faoliyatli hamda metakognitiv-prognostik komponentlari tavsiflangan. Shuningdek, mazkur kompetentlikni shakllantirishning protsessual mantig‘i “tajriba – refleksiya – tahlil – konseptuallashtirish – kasbiy bilim – transfer” ketma-ketligi asosida yoritilgan.*

Kalit so‘zlar: *bo‘lajak o‘qituvchi, pedagogik tajriba, kasbiy bilim, refleksiya, refleksiv tahlil, konseptuallashtirish, pedagogik kompetentlik, tajribaviy o‘rganish, professional rivojlanish, bilim transferi.*

Abstract. *This article theoretically substantiates the pedagogical essence, content, and structural composition of future teachers’ competence in transforming pedagogical experience into knowledge. It is argued that pedagogical experience does not automatically become professional knowledge; rather, this process requires reflective analysis of experience, identification of cause-and-effect relationships, connection with pedagogical theory, conceptualization, and transfer to new situations. An authorial definition of the concept of “competence in transforming pedagogical experience into knowledge” is proposed, and its motivational-axiological, reflective-analytical, cognitive-conceptual, transformative-activity-based, and metacognitive-prognostic components are described. In addition, the procedural logic of developing this competence is presented through the sequence: “experience – reflection – analysis – conceptualization – professional knowledge – transfer.”*

Keywords: *future teacher, pedagogical experience, professional knowledge, reflection, reflective analysis, conceptualization, pedagogical competence, experiential learning, professional development, knowledge transfer.*

KIRISH

Zamonaviy pedagogik ta’lim oldida turgan muhim vazifalardan biri bo‘lajak o‘qituvchining nazariy bilimlarni egallashi bilangina cheklanmay, pedagogik faoliyat jarayonida orttirilgan tajribadan ongli ravishda o‘rganish qobiliyatini rivojlantirishdan iborat. Pedagogik amaliyot, mikroo‘qitish, keyslar bilan ishlash, kuzatish, simulyatsiya va muammoli pedagogik vaziyatlarni hal etish talabaga katta hajmdagi empirik tajriba beradi. Biroq tajribaning mavjudligi uning avtomatik ravishda professional bilimga aylanishini anglatmaydi. Bo‘lajak o‘qituvchi pedagogik vaziyatda nima sodir bo‘lganini eslab qolishi mumkin, ammo u nima sababdan aynan shunday natija yuzaga kelganini, qaysi pedagogik omillar ta’sir ko‘rsatganini, qanday nazariy qonuniyat bilan bog‘liqligini va keyingi o‘xshash vaziyatda qanday harakat qilish zarurligini anglab yetmasa, tajriba epizodik xotira darajasida

qoladi. Shu sababli pedagogik oliy ta’limda “tajribaga ega bo‘lish”dan “tajribadan bilim hosil qilish”ga o‘tish alohida ilmiy-pedagogik muammo sifatida namoyon bo‘lmoqda. D.A.Kolbning tajribaviy o‘rganish konsepsiyasida o‘rganish konkret tajriba, refleksiv kuzatish, abstrakt konseptuallashtirish va faol eksperiment o‘rtasidagi uzviy jarayon sifatida qaraladi. D.Schön esa professional faoliyatdagi rivojlanishni refleksiv amaliyot bilan bog‘lab, mutaxassis amaliy vaziyatda mavjud bilimlarni shunchaki qo‘llamasligi, balki faoliyat davomida o‘z harakatlarini anglab, yangi professional bilim hosil qilishini ta’kidlaydi. J.A.Moon refleksiyani o‘rganish va professional rivojlanishni kuchaytiruvchi mexanizm sifatida izohlaydi, M.Eraut esa professional muhitda formal bilim bilan bir qatorda kontekstual va yashirin bilimlar ham shakllanishini ko‘rsatadi.

Mazkur nazariy qarashlar bo‘lajak o‘qituvchilar tayyorlash jarayonida pedagogik tajribani refleksiv qayta ishlash va undan umumlashtirilgan kasbiy bilim hosil qilishni alohida kompetentlik sifatida tadqiq qilish zarurligini belgilaydi.

TADQIQOT METODOLOGIYASI

Tadqiqotda pedagogik va psixologik adabiyotlarni nazariy tahlil qilish, qiyosiy tahlil, tizimlashtirish, umumlashtirish, pedagogik modellashtirish va tushunchalarni konseptual aniqlashtirish metodlaridan foydalanildi. Tajribaviy o‘rganish, refleksiv amaliyot, professional bilim hamda kasbiy kompetentlikka oid nazariy yondashuvlar o‘zaro integratsiyada o‘rganildi. Tahlil jarayonida “pedagogik tajriba”, “refleksiya”, “professional bilim”, “tajribadan o‘rganish” tushunchalari orasidagi funksional aloqalarni aniqlash hamda pedagogik tajribani bilimga aylantirish jarayonining ichki mexanizmlarini ochib berishga alohida e’tibor qaratildi.

NATIJALAR VA MUHOKAMA

Pedagogik tajriba bo‘lajak o‘qituvchining pedagogik vaziyatlarda bevosita yoki bilvosita ishtiroki natijasida to‘plangan kuzatishlar, harakatlar,

qarorlar, hissiy kechinmalar va ularning oqibatlari majmui sifatida qaralishi mumkin. Tajribaning professional rivojlanish uchun qiymati esa uning hajmiga emas, balki shaxs tomonidan qanday qayta ishlanishiga bog‘liq. Masalan, talaba dars jarayonida tanlangan metod kutilgan natijani bermaganini kuzatishi mumkin. Mazkur hodisaning o‘zi tajriba hisoblanadi. Agar talaba faqat “metod samarasiz bo‘ldi” degan xulosaga kelsa, bu hodisaning tashqi natijasini qayd etishdan iborat bo‘ladi. Agar u metodning nega ishlamaganini, o‘quvchilarning tayyorgarligi, topshiriq murakkabligi, vaqt taqsimoti, kommunikativ muhit yoki instruktsiyaning aniqligi kabi omillarni tahlil qilsa, tajriba refleksiv qayta ishlana boshlaydi. Ushbu natijalar pedagogik nazariya bilan bog‘lanib, umumiy prinsip shaklida ifodalansa va keyingi vaziyat uchun yangi harakat strategiyasi ishlab chiqilsa, tajriba kasbiy bilimga transformatsiyalanadi. Shundan kelib chiqib, bo‘lajak o‘qituvchining pedagogik tajribani bilimga aylantirish kompetentligi pedagogik faoliyat jarayonida orttirilgan individual va guruhiy tajribani ongli ravishda qayta ko‘rib chiqish, refleksiv tahlil qilish, undagi sabab-oqibat aloqalarini aniqlash, nazariy bilimlar bilan integratsiyalash, muhim pedagogik qonuniyat va prinsiplarni konseptuallashtirish hamda hosil qilingan bilimni yangi pedagogik vaziyatlarga transfer qilishga imkon beruvchi integrativ kasbiy-shaxsiy sifat sifatida ta’riflanadi.

Mazkur ta’rifda kompetentlikning bir nechta muhim xususiyati mujassam. Birinchidan, tajriba bilimning tayyor shakli emas, balki uning empirik manbai sifatida qaraladi. Ikkinchidan, refleksiya tajriba bilan bilim o‘rtasidagi vositachi mexanizm vazifasini bajaradi. Uchinchidan, tajribadan bilim hosil qilish faqat retrospektiv tahlil bilan tugamaydi, balki nazariy umumlashtirish va keyingi faoliyatni loyihalashni ham o‘z ichiga oladi. To‘rtinchidan, mazkur kompetentlik yangi pedagogik vaziyatlarda oldingi tajribadan moslashuvchan foydalanishni nazarda tutadi. Shu jihatdan pedagogik tajribani bilimga aylantirish kompetentligini oddiy refleksiv

kompetentlik bilan aynanlashtirish maqsadga muvofiq emas. Refleksiya mazkur kompetentlikning markaziy mexanizmlaridan biri bo‘lsa-da, tajribani bilimga transformatsiya qilish refleksiyadan tashqari tahlil, interpretatsiya, nazariy integratsiya, konseptuallashtirish, umumlashtirish va bilim transferi kabi intellektual faoliyatlarni ham qamrab oladi.

1-jadval.

Pedagogik tajribani bilimga aylantirish kompetentligining tarkibiy komponentlari

Komponent	Asosiy mazmuni	Yetakchi ko‘rsatkichlari
Motivatsion-qadriyatli	Pedagogik tajribani kasbiy rivojlanish manbai sifatida qabul qilish	Tajribadan o‘rganishga ehtiyoj, refleksiyaga ochiqlik, xatoni rivojlanish resursi sifatida qabul qilish
Refleksiv-analitik	Pedagogik vaziyatni qayta tiklash, tahlil qilish va sabab-oqibat aloqalarini aniqlash	Muammoni ajratish, o‘z harakatini tahlil qilish, ta’sir etuvchi omillarni aniqlash
Kognitiv-konseptual	Tajribani pedagogik nazariya bilan bog‘lash va umumlashtirilgan bilim hosil qilish	Nazariy tushunchalardan foydalanish, interpretatsiya, konseptuallashtirish, xulosa chiqarish
Transformativ-faoliyatli	Hosil qilingan bilim asosida pedagogik faoliyatni o‘zgartirish	Alternativ yechim yaratish, yangi strategiyani sinash, bilimni boshqa vaziyatga transfer qilish
Metakognitiv-prognostik	O‘zining o‘rganish jarayonini nazorat qilish va kelgusi faoliyatni bashoratlash	O‘z bilim chegaralarini anglash, refleksiv o‘zini baholash, keyingi harakatni rejalashtirish

Motivatsion-qadriyatli komponent boshqa komponentlarning ishga tushishini ta’minlovchi ichki motivatsion asosdir. Agar bo‘lajak o‘qituvchi pedagogik vaziyatlarni faqat baho olish yoki topshiriqni bajarish vositasi sifatida idrok etsa, chuqur refleksiv tahlil yuzaga kelmasligi mumkin.

Aksincha, tajribani kasbiy o‘sish manbai sifatida qabul qilish talabaning o‘z faoliyatini tanqidiy va konstruktiv tahlil qilishga tayyorligini kuchaytiradi.

Refleksiv-analitik komponent real pedagogik vaziyatni qayta ko‘rib chiqish bilan bog‘liq. Bunda talaba “Nima sodir bo‘ldi?”, “Men qanday harakat qildim?”, “Natijaga qaysi omillar ta’sir ko‘rsatdi?”, “Nima boshqacha bajarilishi mumkin edi?” kabi savollar orqali vaziyatning ichki tuzilishini aniqlaydi. Aynan shu bosqichda refleksiv debrifing texnologiyasi katta didaktik ahamiyatga ega bo‘lishi mumkin, chunki tizimli savollar va muloqot orqali oddiy voqea bayoni analitik faoliyatga aylantiriladi.

Kognitiv-konseptual komponent tajribaning professional bilimga aylanishida hal qiluvchi bosqichni tashkil qiladi. Unda amaliy vaziyat natijalari pedagogika, psixologiya va metodikaga oid nazariy tushunchalar orqali izohlanadi. Talaba konkret holat chegarasidan chiqib, umumiy pedagogik qonuniyat yoki prinsipni aniqlashga harakat qiladi. Shu tariqa “aynan shu darsda sodir bo‘lgan hodisa” asta-sekin “o‘xshash pedagogik vaziyatlarda foydalanish mumkin bo‘lgan professional bilim” shakliga ega bo‘ladi.

Transformativ-faoliyatli komponent hosil qilingan bilimning amaliy qiymatini ta’minlaydi. Bilim yangi vaziyatda qo‘llanmasa, u faqat deklarativ xulosa sifatida qolib ketishi mumkin. Shu sababli bo‘lajak o‘qituvchi o‘z tajribasidan chiqarilgan xulosalar asosida yangi harakat strategiyalarini ishlab chiqishi, ularni pedagogik amaliyotda tekshirishi va zarur holatda qayta korreksiyalashi lozim.

Metakognitiv-prognostik komponent esa bo‘lajak o‘qituvchining o‘z kasbiy o‘rganish jarayonini boshqarish qobiliyatini ifodalaydi. Talaba nafaqat “nimani o‘rgandim?”, balki “bu bilimni qanday hosil qildim?”, “qaysi savollar ochiq qoldi?”, “keyingi vaziyatda nimalarga e’tibor qaratishim kerak?” kabi metakognitiv savollar asosida o‘z professional rivojlanishini rejalashtiradi.

pedagogik tajriba → refleksiv qayta tiklash → analitik interpretatsiya → nazariy integratsiya → konseptual umumlashtirish → kasbiy bilim → yangi pedagogik vaziyatga transfer → yangi tajriba

Mazkur jarayon chiziqli emas, balki siklik xarakterga ega. Yangi pedagogik harakat yangi tajribani yuzaga keltiradi, u esa yana refleksiv tahlil obyekti bo‘ladi. Shu tariqa bo‘lajak o‘qituvchining kasbiy rivojlanishi uzluksiz o‘zini yangilab boruvchi refleksiv-o‘rganuvchi jarayonga aylanadi. Bu jihat tajribaviy o‘rganish va refleksiv professional faoliyat konsepsiyalari bilan metodologik jihatdan uyg‘unlashadi.

Pedagogik tajribani bilimga aylantirish kompetentligini rivojlantirish bo‘lajak o‘qituvchilarning xatolarni yashirish yoki ulardan qochishidan ko‘ra ularni professional rivojlanish resursiga aylantirishiga, nazariya va amaliyot o‘rtasidagi uzilishni kamaytirishga, pedagogik qarorlarning asoslanganligini oshirishga hamda o‘z faoliyatini mustaqil takomillashtirishga xizmat qiladi.

XULOSA

Bo‘lajak o‘qituvchining professional rivojlanishi faqat pedagogik tajriba hajmining ortishi bilan belgilanmaydi. Tajriba uning mazmunini anglash, refleksiv tahlil qilish, nazariy bilimlar bilan bog‘lash, konseptuallashtirish va keyingi faoliyatga transfer qilish orqali kasbiy bilimga aylanadi. Tadqiqot natijasida pedagogik tajribani bilimga aylantirish kompetentligi pedagogik tajribani refleksiv qayta ishlash, tahlil va interpretatsiya qilish, nazariy bilimlar bilan integratsiyalash, umumlashtirilgan kasbiy bilim hosil qilish hamda ushbu bilimni yangi pedagogik vaziyatlarda qo‘llashni ta’minlaydigan integrativ kasbiy-shaxsiy sifat sifatida aniqlashtirildi.

Mazkur kompetentlikning motivatsion-qadriyatli, refleksiv-analitik, kognitiv-konseptual, transformativ-faoliyatli va metakognitiv-prognostik komponentlardan tarkib topishi asoslandi. Ularning o‘zaro yaxlitligi bo‘lajak o‘qituvchini pedagogik faoliyatning passiv “tajriba to‘plovchisi”dan o‘z

tajribasini tahlil qiluvchi, undan professional bilim yaratuvchi va yangi pedagogik qarorlar ishlab chiquvchi refleksiv amaliyot subyekti darajasiga olib chiqadi.Mazkur nazariy asoslar kelgusida refleksiv debrifing vositasida pedagogik tajribani bilimga aylantirish kompetentligini rivojlantirish texnologiyasi, uning pedagogik shart-sharoitlari hamda diagnostik mezon va ko‘rsatkichlarini ishlab chiqish uchun metodologik asos bo‘lib xizmat qiladi.

FOYDALANILGAN ADABIYOTLAR

1. Kolb D.A. Experiential Learning: Experience as the Source of Learning and Development. – Englewood Cliffs, NJ: Prentice-Hall, 1984.

2. Schön D.A. The Reflective Practitioner: How Professionals Think in Action. – New York: Basic Books, 1983.

3. Moon J.A. Reflection in Learning and Professional Development: Theory and Practice. – London: Kogan Page, 1999.

4. Eraut M. Informal learning in the workplace // Studies in Continuing Education. – 2004. – Vol. 26, No. 2. – P. 247–273. DOI: 10.1080/158037042000225245.

ПРОБЛЕМА НЕХВАТКИ КАДРОВ В СИСТЕМЕ ОБРАЗОВАНИЯ УЗБЕКИСТАНА (1991–2000 гг.)

Паризод Шухрат кизи Одилжонова

Базовый докторант Института историиИнститут, Академии наук Республики Узбекистан.

Ташкент, Узбекистан

Аннотация. *В данной статье с историко-теоретической точки зрения анализируется проблема нехватки кадров, возникшая в системе образования Узбекистана в первые годы независимости, в частности в 1991–2000 годах. Освещаются рост потребности системы образования в квалифицированных педагогических кадрах в начальный период независимости, усиление кадрового дефицита в отдельных регионах, а также проблемы, связанные с условиями труда и социальным положением педагогов. В исследовании раскрывается влияние кадровой проблемы данного периода на процесс реформирования системы образования, а также её роль в последующей образовательной политике.*

Ключевые слова: *система образования, педагогические кадры, нехватка кадров, кадровое обеспечение, квалифицированный специалист, реформа образования, Закон «Об образовании».*

Abstrac. *This article provides a historical and theoretical analysis of the problem of staff shortages that emerged in Uzbekistan's education system during the early years of independence, particularly in the period from 1991 to 2000. It examines the growing need for qualified teaching staff in the education system during the initial period of independence, the increasing shortage of personnel in certain regions, and problems related to teachers' working conditions and social status. The study also explores the impact of the personnel shortage of this period on the process of education system reform and its role in subsequent education policy.*

Keywords: *education system, teaching staff, staff shortage, staffing provision, qualified specialist, education reform, Law "On Education".*

ВВЕДЕНИЕ

Правовое регулирование системы образования в Республике Узбекистан начало формироваться с первых лет независимости. В частности, Закон Республики Узбекистан «Об образовании» впервые был принят 2 июля 1992 года за № 636-XII и определил правовые основы развития сферы образования в стране. Впоследствии, с учётом реформ, проводимых в системе образования, а также социально-экономических изменений, 29 августа 1997 года данный закон был принят в новой редакции. В этот же период была утверждена «Национальная программа по подготовке кадров»[21], которая способствовала формированию системы непрерывного образования в стране и совершенствованию процесса подготовки современных кадров.

В Республике был принят ряд указов Президента и постановлений Правительства, направленных на социально-экономическую поддержку работников системы образования и науки. В частности, в период с 1 сентября 1990 года по 1 марта 1995 года было принято более 20 указов, направленных на повышение заработной платы преподавателей высших и средних специальных образовательных учреждений, а также стипендий студентов и учащихся. Вместе с тем в указанные годы был разработан и внедрён в практику ряд нормативно-правовых документов, направленных на повышение материального благосостояния педагогических работников и обучающейся молодёжи, а также на обеспечение их социальной защиты. В частности, на местах в определённой степени были реализованы меры по повышению заработной платы и стипендий, приватизации жилья, а также введению

[21] Закон Республики Узбекистан «Об образовании». Ведомости Олий Кенгаша Республики Узбекистан, 1992 г., № 9, ст. 342; «Национальная программа подготовки кадров». Ведомости Олий Мажлиса Республики Узбекистан, 1997 г., № 11–12, ст. 295.

льгот по оплате электроэнергии, отопления и других коммунальных услуг[22].

В данный период на основе реализации Закона Республики Узбекистан «Об образовании» были достигнуты определённые положительные результаты в реформировании системы образования. В частности, за полтора года были введены в эксплуатацию школы на 37 400 ученических мест и дошкольные образовательные учреждения на 3 065 мест, создано 78 лицеев и гимназий. В системе высшего образования также произошли значительные изменения: в ряде высших учебных заведений была внедрена многоступенчатая система подготовки специалистов. В частности, была налажена деятельность новых высших и средних специальных образовательных учреждений, таких как Андижанский и Каршинский экономико-инженерные институты, Ташкентский авиационный институт, Навоийский горный институт, а также технические колледжи в Алмалыке, Ангрене и Чирчике. Одновременно был создан ряд бизнес-школ, специализированных колледжей, лицеев и гимназий. В тот период в системе народного образования работало более 550 тысяч педагогических работников, а в системе высшего и среднего специального образования — около 24 тысяч педагогических кадров. В 132 высших и средних специальных учебных заведениях системы обучалось 134 тысячи студентов и учащихся. Вместе с тем социальная защита работников системы образования и науки рассматривалась как одна из актуальных проблем. Несмотря на то, что руководством республики этому направлению уделялось особое внимание, в связи с

[22] ЦГА РУз. Фонд М-107, опись 1, дело 44, листы 36–37.

экономическими трудностями некоторые проблемы по-прежнему сохранялись[23].

На следующем этапе реформ в сфере образования 23 сентября 2020 года была принята новая редакция Закона Республики Узбекистан «Об образовании» (№ ЗРУ-637), в результате чего была создана важная правовая база для развития современной системы образования, повышения качества образования и приведения его в соответствие с международными стандартами. Данный закон служит регулированию действующей системы образования, координации деятельности всех уровней образования, а также дальнейшему углублению реформ, осуществляемых в данной сфере.

ОСНОВНАЯ ЧАСТЬ

В исторических условиях переходного периода, характеризовавшегося, в частности, 1991–2000 годами, одной из наиболее актуальных проблем, стоявших перед системой образования, являлся дефицит педагогических кадров. С научной точки зрения качество образования зависит от множества факторов, среди которых решающее значение имеют численность, квалификация и уровень профессиональной подготовки учителей. В системе образования, не обеспеченной достаточным количеством высококвалифицированных педагогических кадров, снижается эффективность образовательного процесса, а уровень знаний учащихся не достигает ожидаемых результатов.

Анализ, проведённый на примере города Ташкента, показал, что в обеспечении учреждений народного образования специалистами существовали значительные трудности. В частности, в 1997 году в городе оставались вакантными 860 должностей учителей (по

[23] ЦГА РУз. Фонд М-107, опись 1, дело 52, листы 32–33.

предметам: узбекский язык и литература, математика, химия, биология, физическая культура), а также 380 должностей работников дошкольного образования. Кроме того, в 58 школах не преподавались уроки староузбекской письменности, что являлось ярким проявлением нехватки педагогических кадров.

Проведённые в период до 2000-х годов анализы показали, что ежегодно в среднем существовала потребность примерно в 3500 педагогических кадрах. В частности, ежегодная потребность составляла 830 учителей родного языка, 850 учителей начальных классов, 270 учителей иностранных языков, 250 учителей физической культуры, 165 учителей математики и 150 специалистов по химии и биологии. Особенно остро постепенно ощущалась нехватка квалифицированных кадров в школах с русским языком обучения[24].

Региональные примеры также подтверждают системный характер данной проблемы. Например, в школах Сырдарьинской области, подвергшихся проверке, было установлено, что из 16 учителей физики 4 не имели соответствующей специальности, а в городе Янгиере из 9 учителей химии 4 также являлись лицами без профильного образования. В течение этих лет потребность отделов народного образования в квалифицированных учителях не была полностью удовлетворена.

Данная ситуация непосредственно негативно сказывалась на качестве образования. В частности, наблюдалось снижение уровня знаний учащихся по физике, химии, биологии, математике и родному языку. Кроме того, недостаточная сформированность материально-технической базы школ ещё больше усугубляла проблему. В частности, в кабинетах химии ощущалась нехватка реактивов и демонстрационных

[24] ЦГА РУз. Фонд М-26, опись 1, дело 1, лист 247.

приборов, в кабинетах физики — оборудования для проведения практических занятий, а при изучении биологии — природных объектов и лабораторного оснащения. В результате практическая часть учебных программ выполнялась лишь на 50–60 процентов.

Низкий уровень средней заработной платы работников системы образования способствовал переходу квалифицированных учителей в другие сферы деятельности. Только в 1997–1999 годах около 35 тысяч педагогов-учителей, имевших соответствующее образование и квалификацию, по различным причинам покинули систему образования, из которых 26,3 тысячи человек перешли в другие отрасли экономики[25]. В результате освободившиеся рабочие места стали занимать неквалифицированные работники.

Образовательные учреждения являются одним из важнейших социальных институтов, определяющих социально-экономическое развитие общества. Все звенья системы образования — от дошкольного до высшего образования — играют решающую роль не только в предоставлении знаний и навыков, но и в процессе духовного развития личности, её профессионального становления и определения своего места в обществе. Поэтому материально-техническое состояние системы образования, качество учебного процесса, потенциал педагогических кадров и эффективность управления непосредственно связаны с уровнем жизни населения и развитием будущего поколения.

ЗАКЛЮЧЕНИЕ

Таким образом, в 1991–2000 годах в системе образования Узбекистана были осуществлены важные реформы. Были созданы новые образовательные учреждения и сформированы правовые основы

[25]Алимова Г.А. «Социально-культурная инфраструктура и проблема занятости населения в условиях перехода к рыночной экономике». Диссертация на соискание учёной степени кандидата экономических наук. Ташкент, 2002. 90 с.

системы образования. Вместе с тем сохранялись проблемы, связанные с нехваткой педагогических кадров, слабой материально-технической базой и социальной защитой работников образования. Эти проблемы обусловили необходимость дальнейшего углубления реформ в сфере образования.

СПИСОК ИСПОЛЬЗОВАННОЙ ЛИТЕРАТУРЫ

1. Алимова Г.А. «Социально-культурная инфраструктура и проблема занятости населения в условиях перехода к рыночной экономике». Диссертация на соискание учёной степени кандидата экономических наук. Ташкент, 2002. 90 с.
2. Закон Республики Узбекистан «Об образовании». Ведомости Верховного Совета Республики Узбекистан, 1992 г., № 9, ст. 342; «Национальная программа подготовки кадров». Ведомости Олий Мажлиса Республики Узбекистан, 1997 г., № 11–12, ст. 295.
3. ЦГА РУз. Фонд М-107, опись 1, дело 44, листы 36–37.
4. ЦГА РУз. Фонд М-107, опись 1, дело 52, листы 32–33.
5. ЦГА РУз. Фонд М-26, опись 1, дело 1, лист 247.
6. Закон Республики Узбекистан «Об образовании». Национальная база данных законодательства Республики Узбекистан, 24.09.2020 г., № 03/20/637/1313.

TEACHER ROLES AND STUDENT-CENTERED LEARNING IN UZBEKISTAN: LESSONS FROM FINLAND, JAPAN, AND SOUTH KOREA

Aziza Sheralieva

Independent Researcher

ORCID: 0009-0008-6372-2138

E-mail: azizasheraliyeva90@gmail.com

Abstract: *This article examines teacher roles and teaching approaches in Uzbekistan through a comparison with Finland, Japan, and South Korea. It focuses on teacher-student relationships, student participation, classroom practices, and the different educational priorities found across these countries. The study uses a qualitative comparative approach based on academic literature, educational reports, and other secondary sources. The findings show that teachers in Uzbekistan hold a respected and important position, while the education system also faces challenges related to teacher professional development, class size, and shortages of qualified teachers. Finland places greater emphasis on student participation, independence, and teacher autonomy, while Japan combines teacher authority and classroom discipline with moral and broader student development. South Korea reflects strong academic demands and considerable pressure on students. The comparison suggests that Uzbekistan could benefit from selected practices from these countries without directly adopting any single educational model. Greater student participation and independence can be encouraged while maintaining the important role of teachers and considering Uzbekistan's own educational context.*

Keywords: *Uzbekistan; teacher roles; student-centered learning; teaching approaches; teacher-student relationships; comparative education*

INTRODUCTION

Teachers play an important role in education not only by supporting academic learning but also by guiding students and contributing to their broader development. However, the role of teachers and the way they interact with students can differ considerably across educational and cultural

contexts. In Uzbekistan, teachers have traditionally held a respected position, influenced partly by the cultural tradition of *ustoz-shogird*, in which the teacher is regarded as a source of knowledge and guidance (Schmoller, 2017). At the same time, the education system is undergoing continuing reform, particularly in areas related to teacher professional development and teaching practices (Mamadaminova & Khadjikhanova, 2023). International experience provides useful points of comparison. Finland places considerable emphasis on student participation, independence, and teacher professionalism (Morgan, 2014). In Japan, teacher authority and classroom discipline are closely connected with respect, moral education, and broader student development (Badawi, 2024). South Korea presents a different context, where students spend considerable time studying and experience strong academic pressure (Organisation for Economic Co-operation and Development [OECD], 2025). These differences provide an opportunity to consider how teacher roles and teaching approaches vary across educational systems. Rather than treating one system as a model that can be directly transferred to another, comparison can help identify practices that may be relevant within Uzbekistan's own cultural and educational context. Therefore, this study compares teacher roles, teaching approaches, and teacher-student relationships in Uzbekistan, Finland, Japan, and South Korea. Its main aim is to identify useful practices from these international experiences and consider how they might contribute to the further development of school education in Uzbekistan.

RESEARCH GAP

Existing studies provide useful information about individual aspects of education in Uzbekistan and the other countries included in this study. Research on Uzbekistan has examined teacher professional development and the cultural position of teachers (Mamadaminova & Khadjikhanova, 2023; Schmoller, 2017), while studies and educational reports on Finland, Japan,

and South Korea highlight different educational priorities and practices (Badawi, 2024; Morgan, 2014; OECD, 2023, 2025). However, these perspectives are often discussed separately. This study brings these contexts together by comparing teacher roles, teaching approaches, and teacher-student relationships across Uzbekistan, Finland, Japan, and South Korea. The comparison is used to consider which practices may be relevant to Uzbekistan without assuming that a foreign education system can be directly transferred to its cultural and educational context.

AIM OF THE STUDY

The aim of this study is to compare teacher roles and teaching approaches in Uzbekistan, Finland, Japan, and South Korea and to identify practices that may contribute to the further development of school education in Uzbekistan.

RESEARCH QUESTIONS

1. How does the role of teachers in Uzbekistan differ from the roles of teachers in Finland, Japan, and South Korea?
2. How do teaching approaches and levels of student participation differ across these educational contexts?
3. What useful practices from Finland, Japan, and South Korea could be considered for school education in Uzbekistan?

LITERATURE REVIEW

Teacher roles and teaching approaches differ across educational systems and are influenced by both professional expectations and cultural traditions. In Uzbekistan, the position of the teacher is connected with the *ustoz-shogird* tradition, which places importance on respect, guidance, and the authority of the teacher (Schmoller, 2017). At the same time, recent research shows that teacher professional development in Uzbekistan is changing, although teachers continue to face challenges related to access to relevant training, workload, and the practical use of newly acquired teaching

methods (Mamadaminova & Khadjikhanova, 2023). The study also discusses difficulties in translating professional development into classroom practice, including the continued use of traditional methods in some examples. Finland provides a different educational perspective. Its education system gives considerable importance to teacher professionalism and autonomy, while students are encouraged to participate actively in learning and develop greater independence (Morgan, 2014). This provides a useful example of how a strong professional role for teachers can exist alongside student-centered learning. In Japan, teacher authority and classroom discipline are closely connected with cultural expectations of respect and responsibility. Teachers also contribute to moral education and students' broader development, suggesting that authority and broader student development can operate together within the same educational context (Badawi, 2024). South Korea represents another educational context in which students experience strong academic demands. OECD evidence indicates that Korean students spend considerable time studying outside formal school hours, reflecting substantial academic pressure (OECD, 2025). At the same time, OECD PISA evidence suggests that many Korean students perceive their teachers as interested in their learning and willing to provide additional support when needed (OECD, 2023). Taken together, the literature shows that teacher authority, student participation, professional autonomy, discipline, and academic expectations can take different forms across national contexts. These differences provide the basis for comparing the four education systems without assuming that one approach is universally suitable.

Methodology

This study uses a qualitative comparative approach to examine differences in school education in Uzbekistan, Finland, Japan, and South Korea. The comparison focuses particularly on teacher roles and teaching practices across the four educational contexts. The study is based on

secondary sources, including academic journal articles, existing studies, and educational reports. Relevant materials were identified mainly through Google Scholar and other academic and institutional sources. Sources were selected according to their relevance to the main areas of comparison. The analysis focuses on teacher roles, teaching approaches, teacher-student relationships, classroom discipline, teacher professional development, student participation, and academic demands. These areas were compared across the four countries to identify important similarities and differences and to consider which practices may be relevant to school education in Uzbekistan. No primary data were collected for this study. The analysis therefore relies on existing academic and educational sources. Since educational practices are closely connected to national and cultural contexts, the findings were interpreted within the context of each country rather than treating any one education system as a universal model.

Comparative Analysis and Results

Uzbekistan

In Uzbekistan, teachers traditionally hold a respected and culturally important position. The *ustoz-shogird* tradition reflects the cultural importance of respect for teachers and their role in providing guidance to students (Schmoller, 2017). At the same time, practical challenges remain within the education system. Recent research indicates continuing pressure related to class size and teacher professional development. Mamadaminova and Khadjikhanova (2023) report that classrooms continue to accommodate around 35 students and identify challenges connected with professional development and teachers' workloads. Their study also discusses difficulties in applying newly learned teaching methods in practice. Shortages of qualified teachers also remain unevenly distributed. Omonova (2026) reports that 545 schools were identified as experiencing shortages of highly qualified teaching staff, despite an overall increase in the number of teachers.

Finland

Finland represents a more student-centered educational approach. Teachers have considerable professional autonomy, while students are encouraged to take an active role in learning and develop greater independence (Morgan, 2014). In this comparison, the Finnish approach therefore provides greater space for student participation and independence.

Japan

The Japanese educational context places importance on teacher authority, classroom discipline, and respect. Teachers play an important role not only in academic learning but also in guiding students' moral and broader development (Badawi, 2024). This suggests that teacher authority and attention to student development do not necessarily operate as opposing approaches. In the Japanese context, clear expectations and respect for teacher authority can exist alongside attention to moral responsibility and broader student development (Badawi, 2024).

South Korea

South Korean students experience strong academic demands. OECD evidence indicates that Korean students spend significantly more time studying than students in many other countries, particularly outside formal school hours, reflecting substantial academic pressure (OECD, 2025). At the same time, the Korean context should not be described only in terms of pressure. OECD PISA evidence indicates that many Korean students report that their mathematics teachers show interest in their learning and provide additional support when needed (OECD, 2023). This adds a teacher-support dimension to the Korean comparison.

Comparative Findings

The comparison shows different educational priorities across the four contexts. Uzbekistan combines a culturally respected teacher role with practical challenges related to teacher professional development, class size,

and shortages of qualified teachers (Mamadaminova & Khadjikhanova, 2023; Omonova, 2026; Schmoller, 2017). Finland gives greater emphasis to student participation, independence, and teacher autonomy (Morgan, 2014). Japan demonstrates how teacher authority and discipline can coexist with moral and broader student development (Badawi, 2024), while South Korea illustrates strong academic demands alongside evidence of teacher support (OECD, 2023, 2025). Overall, the findings show that teacher roles and educational practices are closely connected to national and cultural contexts. For Uzbekistan, the comparison therefore points toward selective adaptation rather than direct adoption of any single foreign model.

DISCUSSION

The findings show that teacher roles and teaching practices differ across the four educational contexts and cannot be separated from their cultural and institutional backgrounds. For this reason, practices used in Finland, Japan, or South Korea cannot simply be transferred to Uzbekistan without considering local conditions. An important finding is that a respected teacher role and greater student participation do not necessarily need to be treated as opposing approaches. Finland combines teacher professionalism and autonomy with active student participation (Morgan, 2014), while Japan shows that teacher authority and classroom discipline can coexist with attention to moral and broader student development (Badawi, 2024). These examples suggest that Uzbekistan could encourage greater student participation and independence while maintaining the culturally important role of teacher guidance. South Korea adds another perspective. Its students face strong academic demands and considerable study pressure (OECD, 2025), while PISA evidence also indicates that many students report supportive teacher practices (OECD, 2023). This suggests that academic expectations and teacher support can exist together, although the level of pressure experienced by students should also be considered. For Uzbekistan,

the comparison therefore supports selective adaptation rather than direct adoption of a foreign model. Any changes in classroom practice should also take account of continuing challenges in teacher professional development and class size (Mamadaminova & Khadjikhanova, 2023), as well as shortages of qualified teachers in some schools (Omonova, 2026).

RECOMMENDATIONS

Based on these findings, Uzbekistan could preserve the respected and guiding role of teachers while gradually providing students with more opportunities for active participation and greater responsibility for their learning. Greater attention could also be given to teaching practices that encourage student participation and independence. The Finnish experience suggests that these practices can develop alongside a strong professional role for teachers (Morgan, 2014). Teacher professional development should also remain an important priority. Particular attention could be given to supporting the practical application of newly learned teaching methods in classroom practice (Mamadaminova & Khadjikhanova, 2023). Practical challenges such as class-size pressures and shortages of qualified teachers should also be considered when introducing changes (Mamadaminova & Khadjikhanova, 2023; Omonova, 2026). Finally, practices from Finland, Japan, and South Korea should be adapted selectively to Uzbekistan's cultural and educational context rather than copied directly.

CONCLUSION

This study compared teacher roles and teaching approaches in Uzbekistan, Finland, Japan, and South Korea. The findings show that each educational context reflects different cultural traditions, professional expectations, and educational priorities. The comparison suggests that Uzbekistan can learn from international experience without directly adopting any single model. Greater student participation and independence can be encouraged while maintaining the respected role of teachers. At the same

time, teacher professional development and practical challenges within the school system require continued attention. Overall, a selective approach that combines relevant international experience with Uzbekistan's own educational context appears to be a more appropriate direction for further development.

REFERENCES

Badawi, H. (2024). Exploring classroom discipline strategies and cultural dynamics: Lessons from the Japanese education system. *Tafkir: Interdisciplinary Journal of Islamic Education, 5*(1), 1–12. doi:10.31538/tijie. v5i1.663

Mamadaminova, N., & Khadjikhanova, S. (2023). Navigating continual progress: Insights into teacher professional development in Uzbekistan. *Kwartalnik Pedagogiczny, 68*(4), 123–144. doi:10.31338/2657-6007.kp.2023-4.7

Morgan, H. (2014). Review of research: The education system in Finland: A success story other countries can emulate. *Childhood Education, 90*(6), 453–457. doi:10.1080/00094056.2014.983013

Organisation for Economic Co-operation and Development. (2023). *PISA 2022 results (Volume I and II): Country notes—Korea.*

Organisation for Economic Co-operation and Development. (2025). *Education at a glance 2025: Korea.*

Omonova, M. M. (2026). Improving the integration between professional development and employment in pedagogical higher education. *Journal of Science and Education, 7*(1), 2030–2041. doi:10.58905/jse. v7i1.832

Schmoller, J. (2017). Embodying moral superiority: The master–apprentice relationship and national cultural heritage in Uzbekistan. *Problems of Post-Communism, 64*(6), 370–381.

IDENTIFICATION OF NONLINEAR FILTRATION MODEL PARAMETERS FROM PRESSURE OBSERVATION DATA

Ezoza Abdurakhmanova

Karshi State Technical University, Karshi, Uzbekistan

abduraxmonovaezoza47@gmail.com

Abstract. *An inverse method for identifying nonlinear filtration parameters from pressure observations is proposed. The forward problem is a one-dimensional transient model with pressure-dependent diffusivity. Two unknown coefficients are recovered by minimizing the discrepancy between calculated and observed pressures. In a synthetic dimensionless experiment, the reference parameters were reconstructed with relative errors of 1.13% and 3.67%; the pressure fit yielded RMSE 0.00124 and MAE 0.00089. The results show that pressure-history matching can be used for calibration of nonlinear porous-media filtration models.*

Keywords: *inverse problem, parameter identification, nonlinear filtration, porous medium, pressure observations, optimization.*

INTRODUCTION

Filtration models contain coefficients that are difficult to measure directly under reservoir conditions. Therefore, permeability-related parameters are often inferred from pressure observations. This converts the usual forward calculation into an inverse problem, where model coefficients are reconstructed from measured system response. Inverse identification is sensitive to data quality and numerical accuracy, so a stable forward solver and an appropriate objective function are required (Tarantola, 2005; Kaipio & Somersalo, 2005). The aim of this work is to identify two nonlinear filtration parameters from limited pressure data.

MATERIALS AND METHODS

A dimensionless one-dimensional transient filtration model is considered on $0 \le x \le 1$:

$$\partial p / \partial t = \partial / \partial x \left[k_0 (1 + \alpha p) \, \partial p / \partial x \right].$$

Here $p = p(x,t)$ is normalized pressure, k_0 is the reference permeability-scale coefficient, and α describes pressure sensitivity. The conditions are $p(x,0)=0$, $p(0,t)=1$, and $p(1,t)=0$. For specified parameters, the forward problem is solved by an implicit finite-difference scheme on 61 spatial nodes with $\Delta t = 0.002$.

Synthetic pressure observations were generated at $x=0.25$, 0.50, and 0.75 for six time levels. Small perturbations were added to imitate measurement noise. The reference values were $k_0=0.18$ and $\alpha=0.65$. The unknown vector $\theta=(k_0,\alpha)$ was estimated by least-squares minimization:

$$J(\theta) = (1/Nobs) \, \Sigma_i \left[pcalc(x_i, t_i; \theta) - pobs(x_i, t_i) \right]^2.$$

The optimization started from $k_0=0.12$ and $\alpha=0.30$. At every iteration, the forward model was solved again and the residuals at the observation points were updated. This procedure identifies the coefficients that best reproduce the complete pressure histories.

RESULTS AND DISCUSSION

The recovered coefficients were $k_0=0.1820$ and $\alpha=0.6261$. Their relative errors with respect to the reference values were 1.13% and 3.67% (Table 1). The identified model reproduced the pressure observations at all three sensor positions (Fig. 1), with RMSE=0.00124 and MAE=0.00089. These results confirm that the inverse formulation can recover nonlinear model parameters from a limited set of pressure measurements.

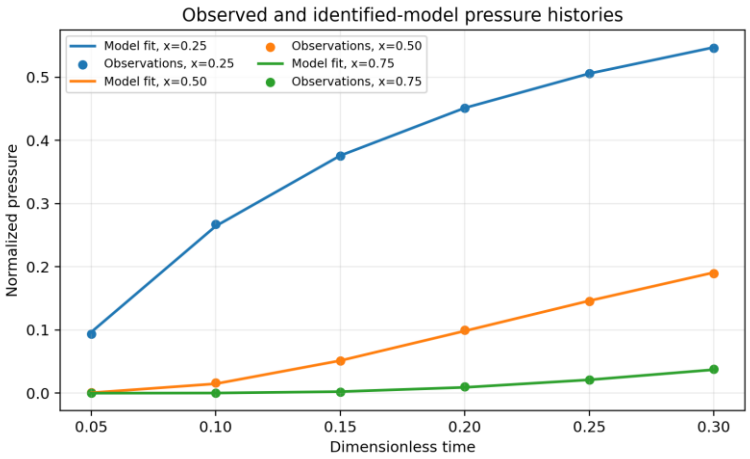


Fig. 1. Observed and calculated pressure histories.

Table 1.

Parameter identification results.

Parameter	Reference	Identified	Error, %
k_0	0.180	0.1820	1.13
α	0.650	0.6261	3.67

Unlike direct simulation, the inverse problem treats pressure as known information and the coefficients as unknowns. In practical field applications, regularization and uncertainty analysis may be required for sparse or noisy data. The same framework can be extended to pressure-dependent porosity, layer-specific permeability, or colmatation parameters.

CONCLUSION

A compact inverse approach for nonlinear transient filtration has been developed. Combining an implicit finite-difference forward solver with least-squares optimization recovered k_0 and α with errors below 4% in the illustrative synthetic experiment. The method can serve as a basis for calibrating porous-media filtration models from pressure observations and for future extension to multilayer and field-data problems.

REFERENCES

[1] Tarantola, A. (2005). Inverse problem theory and methods for model parameter estimation. SIAM.

[2] Kaipio, J., & Somersalo, E. (2005). Statistical and computational inverse problems. Springer.

[3] Khuzhayorov, B. Kh., Fayziev, B. M., & Kholiyarov, E. Ch. (2024). Parallel algorithm for identification of parameters of the model of suspension filtration in a porous medium. Problems of Computational and Applied Mathematics, 1(55).

[4] Ravshanov, N., Nematov, A., & Ismailov, Sh. (2024). Parallel algorithm for solving the oil filtration problem considering changes in reservoir permeability.

[5] Problems of Computational and Applied Mathematics, 4(58), 18–32.

Samarskii, A. A. (2001). The theory of difference schemes. Marcel Dekker.

STEAM TA'LIMI VA PEDAGOGIK MADANIYAT INTEGRATSIYASI

Xojamov Ilhomjon Rahmonaliyevich –

Farg'ona davlat universiteti mustaqil izlanuvchisi

Annotatsiya.*Mazkur maqolada STEAM ta'limi va pedagogik madaniyatning o'zaro integratsiyasi nazariy-pedagogik jihatdan tahlil qilingan. STEAM yondashuvining fanlararo integratsiya, kreativ fikrlash, muammoli vaziyatlarni hal etish, loyihaviy faoliyat va innovatsion ta'lim muhitini tashkil etish imkoniyatlari pedagogning kasbiy madaniyati bilan bog'liq holda yoritilgan. Pedagogik madaniyatning aksiologik, kognitiv, texnologik, kommunikativ, kreativ va refleksiv tarkibiy qismlari STEAM ta'limi tamoyillari bilan uyg'unlashtirilgan. Tadqiqot natijasida STEAM ta'limi va pedagogik madaniyat integratsiyasining mazmuniy-funksional yo'nalishlari aniqlanib, mazkur integratsiyaning pedagogning innovatsion faoliyati, kasbiy moslashuvchanligi va ta'lim oluvchilarning ijodiy faolligini rivojlantirishdagi ahamiyati asoslangan.*

Kalit so'zlar: *STEAM ta'limi, pedagogik madaniyat, fanlararo integratsiya, pedagogik kompetentlik, kreativlik, innovatsion faoliyat, loyiha asosida o'qitish, refleksiya, pedagogik texnologiya.*

Аннотация.*В статье с теоретико-педагогической точки зрения анализируется интеграция STEAM-образования и педагогической культуры. Возможности STEAM-подхода, связанные с междисциплинарной интеграцией, творческим мышлением, решением проблемных ситуаций, проектной деятельностью и созданием инновационной образовательной среды, рассматриваются во взаимосвязи с профессиональной культурой педагога. Аксиологический, когнитивный, технологический, коммуникативный, креативный и рефлексивный компоненты педагогической культуры сопоставлены с принципами STEAM-образования. Определены содержательно-функциональные направления интеграции STEAM-образования и педагогической культуры, обосновано их значение в развитии инновационной деятельности, профессиональной гибкости педагога и творческой активности обучающихся.*

Ключевые слова: *STEAM-образование, педагогическая культура, междисциплинарная интеграция, педагогическая компетентность, креативность, инновационная деятельность, проектное обучение, рефлексия, педагогическая технология.*

Abstract. *The article provides a theoretical and pedagogical analysis of the integration of STEAM education and pedagogical culture. The potential of the STEAM approach for interdisciplinary integration, creative thinking, problem solving, project-based activities, and the development of an innovative educational environment is examined in relation to teachers' professional culture. The axiological, cognitive, technological, communicative, creative, and reflective components of pedagogical culture are correlated with the principles of STEAM education. The study identifies the content and functional dimensions of integrating STEAM education with pedagogical culture and substantiates its importance for developing teachers' innovative activity, professional flexibility, and students' creative engagement.*

Keywords: *STEAM education, pedagogical culture, interdisciplinary integration, pedagogical competence, creativity, innovative activity, project-based learning, reflection, educational technology.*

KIRISH

Zamonaviy ta'lim tizimida pedagogning kasbiy faoliyatiga qo'yilayotgan talablar mazmunan o'zgarib, bilimlarni yetkazib berishga asoslangan an'anaviy modeldan ta'lim oluvchining mustaqil izlanishi, muammolarni hal qilishi, ijodiy faoliyat olib borishi va fanlararo aloqalarni anglashini ta'minlovchi pedagogik faoliyat modeliga o'tish kuzatilmoqda. Bunday sharoitda pedagog nafaqat o'z fanining bilimdoni, balki turli fan va faoliyat sohalarini integratsiyalash, zamonaviy texnologiyalardan maqsadli foydalanish, ijodiy ta'lim muhitini yaratish hamda o'z faoliyatini refleksiv baholash qobiliyatiga ega mutaxassis bo'lishi lozim.

Mazkur talablarni amalga oshirishda **STEAM – Science, Technology, Engineering, Arts and Mathematics** ta'lim konsepsiyasi muhim metodologik imkoniyatlarga ega. STEAM yondashuvi tabiiy fanlar, texnologiya, muhandislik, san'at va matematikaning o'zaro bog'liq holda o'qitilishini

nazarda tutib, ta’lim oluvchilarda tanqidiy fikrlash, muammolarni hal etish, ijodkorlik va innovatsion fikrlashni rivojlantirishga yo‘naltiriladi. UNESCO ham STEMni fan, texnologiya, muhandislik va matematika sohalarini integratsiyalovchi hamda tanqidiy fikrlash, muammolarni hal etish va innovatsion faoliyatni rivojlantiruvchi ta’lim yondashuvi sifatida tavsiflaydi. STEAM konsepsiyasida “Arts” komponentining qo‘shilishi esa mazkur modelning faqat texnik va ratsional fikrlash bilan cheklanib qolmasligini, balki estetik tafakkur, dizayn, kreativlik, kommunikatsiya va insonparvarlik qadriyatlari bilan boyitilishini ta’minlaydi. Zamonaviy tadqiqotlarda STEAMning ayniqsa kreativlikni shakllantirish salohiyati yuqori ekanligi, loyiha asosida va tadqiqotga asoslangan ta’lim uning eng ko‘p qo‘llaniladigan pedagogik strategiyalari qatoriga kirishi qayd etilgan. Shu sababli STEAM ta’limining pedagogik madaniyat bilan integratsiyasini o‘rganish dolzarb ilmiy-pedagogik muammo hisoblanadi.

Tadqiqotning maqsadi STEAM ta’limi va pedagogik madaniyatning mazmuniy-funksional bog‘liqligini aniqlash hamda ularni integratsiyalashning pedagog kasbiy faoliyatiga ta’sirini nazariy jihatdan asoslashdan iborat.

Tadqiqot jarayonida ilmiy-pedagogik adabiyotlarni tahlil qilish, qiyosiy tahlil, kontent-tahlil, pedagogik tushunchalarni tizimlashtirish, umumlashtirish, komponentli tahlil va pedagogik modellashtirish metodlaridan foydalanildi.

Pedagogik madaniyat mazkur tadqiqotda pedagogning kasbiy qadriyatlari, pedagogik tafakkuri, metodik mahorati, muloqot etikasi, innovatsion faoliyati hamda o‘z kasbiy faoliyatini tahlil qilish va takomillashtirish qobiliyatini birlashtiradigan integrativ kasbiy sifat sifatida qaraladi. Tadqiqotlarda ham pedagogik madaniyat pedagogning professional kompetentligi va kasbiy qadriyatlari bilan uzviy aloqador tushuncha sifatida tavsiflanadi.

STEAM ta’limining asosiy xususiyati turli fanlarga oid bilimlarni alohida o‘rganish emas, balki ularni real hayotiy muammo, loyiha yoki amaliy vazifa doirasida birlashtirishdir. Bunda o‘quvchi tayyor algoritmni takrorlovchi subyekt emas, balki muammoni aniqlovchi, ma’lumot izlovchi, g‘oya ishlab chiquvchi, model yaratuvchi, sinovdan o‘tkazuvchi va natijani baholovchi faol ishtirokchiga aylanadi. Mazkur jarayonda pedagogning roli ham tubdan o‘zgaradi. U bilimni bir tomonlama uzatuvchidan ta’lim faoliyatining tashkilotchisi, fasilitator, maslahatchi, loyiha koordinatori va refleksiv hamkorga aylanadi. Demak, STEAMni samarali tashkil etish uchun pedagogning faqat fan bilimlari yetarli emas. Undan keng pedagogik madaniyat talab qilinadi.

Ilmiy adabiyotlarda STEAM tushunchasiga turlicha yondashuvlar mavjud bo‘lsa-da, uning asosiy xususiyati fanlararo va transdisiplinar integratsiyaga asoslanishi qayd etiladi. STEAM integratsiyasi multidisiplinar, interdisiplinar, transdisiplinar hamda san’at integratsiyasi shakllarida amalga oshirilishi mumkin.

Bizning fikrimizcha, STEAM ta’limi va pedagogik madaniyat integratsiyasi quyidagi oltita o‘zaro bog‘liq yo‘nalishda namoyon bo‘ladi:

Birinchidan, aksiologik integratsiya. Pedagog STEAM loyihasini tashkil qilish jarayonida faqat texnologik natijani emas, balki insonparvarlik, mas’uliyat, ekologik ong, hamkorlik, mehnat madaniyati va ijtimoiy foydalilik kabi qadriyatlarni ham hisobga olishi kerak. Masalan, ekologik muammoni hal qilishga qaratilgan STEAM loyihasida texnik yechim bilan bir qatorda ekologik mas’uliyat va barqaror rivojlanishga munosabat shakllanadi.

Ikkinchidan, kognitiv-fanlararo integratsiya. Pedagog biror muammoni faqat bitta fan doirasida izohlashdan voz kechib, uning turli ilmiy sohalar bilan bog‘liqligini ko‘ra olishi lozim. Bu pedagogdan tizimli va integrativ tafakkurni talab etadi. Fanlar o‘rtasidagi mazmuniy bog‘lanishlarni aniqlash pedagogik madaniyatning zamonaviy ko‘rinishlaridan biridir.

Uchinchidan, texnologik integratsiya. STEAM muhiti raqamli dasturlar, modellashtirish vositalari, virtual laboratoriyalar, robototexnika, sun'iy intellekt elementlari, multimedia va muhandislik konstruksiyalaridan foydalanishni talab qiladi. Biroq texnologiyaning o‘zi pedagogik samaradorlikni kafolatlamaydi. Uni maqsad, mazmun, ta'lim oluvchining imkoniyati va kutilayotgan natijaga muvofiq tanlay olish pedagogning texnologik-pedagogik madaniyatini namoyon etadi.

To‘rtinchidan, kreativ-estetik integratsiya. STEAM modelidagi "A – Arts" komponenti texnik yechimni estetik, kommunikativ va kreativ jihatdan mukammallashtiradi. San'atning STEAM tarkibiga integratsiyasi dizayn tafakkuri, tasavvur, yangicha yechim yaratish va o‘z g‘oyasini vizual ifodalash imkoniyatlarini kengaytiradi. 2024-yilda o‘tkazilgan tizimli tahlillarda ham san'at komponenti STEAMning kreativlikni rivojlantirish imkoniyatlarini kuchaytirishi ta'kidlangan.

Beshinchidan, kommunikativ-hamkorlik integratsiyasi. STEAM loyihalari ko‘pincha guruh faoliyati shaklida tashkil etiladi. Bunda ta'lim oluvchilar vazifalarni taqsimlaydi, o‘z fikrini asoslaydi, boshqalarning qarashlarini tinglaydi va umumiy natijaga erishishga harakat qiladi. Pedagog esa hamkorlik muhitini tashkil etishi, konstruktiv muloqot va o‘zaro hurmat tamoyillarini ta'minlashi lozim. STEAMni amalga oshirishda turli fan pedagoglari o‘rtasidagi professional hamkorlik ham alohida ahamiyat kasb etadi. Tadqiqotlar bunday fanlararo hamkorlik uchun bilim va tajriba almashinuvini ta'minlovchi professional hamjamiyatlar muhimligini ko‘rsatmoqda.

Oltinchidan, refleksiv integratsiya. Har bir STEAM loyihasi yakunida faqat mahsulot emas, balki unga olib kelgan faoliyat jarayoni ham baholanishi kerak. "Nima muvaffaqiyatli bo‘ldi?", "Qanday xatoga yo‘l qo‘yildi?", "Qaysi usul samaraliroq?", "Natijani yana qanday yaxshilash mumkin?" kabi savollar o‘quvchining ham, pedagogning ham refleksiv madaniyatini rivojlantiradi.

Shu asosda STEAM va pedagogik madaniyat integratsiyasini quyidagi mantiqiy bog‘liqlikda ifodalash mumkin:

Fanlararo bilim → muammoli vaziyat → loyihaviy faoliyat → texnologik yechim → kreativ talqin → hamkorlik → refleksiya → innovatsion pedagogik tajriba.

Mazkur jarayonning takrorlanishi pedagogning kasbiy madaniyatini statik bilimlar majmuasidan doimiy takomillashuvchi professional sifatga aylantiradi.

STEAM pedagog uchun, avvalo, yangicha pedagogik tafakkurni talab qiladi. Chunki bunday darsda oldindan belgilangan yagona “to‘g‘ri javob” bo‘lmasligi mumkin. Pedagog o‘quvchilarning turli yechimlarini qabul qilishi, xatoni o‘rganish imkoniyati sifatida ko‘rishi va mustaqil tajriba uchun pedagogik sharoit yaratishi kerak. Bu holat pedagogik madaniyatning demokratik, insonparvar va dialogik xarakterini kuchaytiradi. O‘quvchi o‘qituvchining ko‘rsatmalarini bajaruvchi obyekt emas, balki bilim yaratilishida faol ishtirok etuvchi subyekt sifatida namoyon bo‘ladi.

Zamonaviy tadqiqotlar STEAMni samarali joriy etishda pedagogning maxsus kompetensiyalari muhimligini ko‘rsatadi. Masalan, STEAM pedagoglari uchun ishlab chiqilgan STEAMComp Edu konseptual tizimida pedagog faoliyatining turli yo‘nalishlarini qamrab oluvchi 41 ta kompetensiya 14 ta kompetensiya sohasi doirasida tizimlashtirilgan. Bu STEAM ta’limining muvaffaqiyati, avvalo, pedagogning tayyorgarlik darajasi va kasbiy rivojlanishi bilan bog‘liqligini ko‘rsatadi. Shuningdek, 2024-yilda e’lon qilingan meta-tahlil STEM faoliyati va o‘qituvchilarning fanlararo dars berish qobiliyatlari o‘rtasida ijobiy bog‘liqlik mavjudligini ko‘rsatgan. Bu natija pedagoglarni STEAM asosida tayyorlash jarayonida fanlararo kompetentlikni pedagogik madaniyatning muhim elementi sifatida rivojlantirish zarurligini tasdiqlaydi. Shu nuqtai nazardan, pedagog kadrlarni tayyorlash va ularning malakasini oshirish jarayonida STEAM yondashuvini alohida mavzu sifatida o‘rgatish

yetarli emas. Uni pedagogik madaniyatni rivojlantirishning amaliy mexanizmi sifatida o‘quv jarayoniga singdirish talab etiladi. Bunda bo‘lajak va amaldagi pedagoglar fanlararo loyihalarni ishlab chiqish, real muammolar uchun pedagogik vaziyatlar yaratish, raqamli vositalardan maqsadli foydalanish, guruh faoliyatini boshqarish hamda loyiha natijalarini refleksiv baholash tajribasiga ega bo‘lishlari lozim. Demak, **STEAM ta’limi pedagogik madaniyatdan tashqarida mavjud bo‘lgan alohida texnologiya emas, balki zamonaviy pedagogik madaniyatning amaliy namoyon bo‘lish shakllaridan biri** sifatida qaralishi maqsadga muvofiq.

STEAM ta’limi va pedagogik madaniyat integratsiyasi zamonaviy ta’limning fanlararo, texnologik, kreativ va insonparvarlik xususiyatlarini yagona pedagogik jarayonda birlashtirish imkonini beradi. STEAM yondashuvi pedagogik madaniyatning aksiologik, kognitiv, texnologik, kreativ, kommunikativ va refleksiv tarkibiy qismlarini amaliy faoliyat jarayonida rivojlantirishga xizmat qiladi. Tahlillar asosida quyidagi xulosalarga kelish mumkin: STEAM ta’limi pedagogdan integrativ va fanlararo tafakkurni talab qiladi; uning samaradorligi pedagogning texnologik bilimidan tashqari pedagogik qadriyatlari, kreativligi, muloqot va refleksiya madaniyatiga ham bog‘liq; STEAM loyihalari pedagog va ta’lim oluvchining hamkorlikdagi ijodiy faoliyatini rivojlantiradi; san’at komponenti ilmiy-texnik faoliyatga estetik, kreativ va insonparvarlik mazmunini olib kiradi; pedagogik ta’limda STEAM yondashuvini tizimli qo‘llash pedagoglarning innovatsion faoliyati va kasbiy moslashuvchanligini rivojlantirishga xizmat qiladi. Shunday qilib, STEAM ta’limi va pedagogik madaniyat integratsiyasi pedagogning zamonaviy kasbiy qiyofasini shakllantirish, ta’lim oluvchilarning ijodiy-intellektual salohiyatini rivojlantirish hamda innovatsion ta’lim muhitini yaratishning istiqbolli pedagogik yo‘nalishi sifatida baholanishi mumkin.

FOYDALANILGAN ADABIYOTLAR

1. Aguilera, D., Ortiz-Revilla, J. STEM vs. STEAM Education and Student Creativity: A Systematic Literature Review // *Education Sciences*. – 2021. – Vol. 11, No. 7. – Article 331. DOI: 10.3390/educsci11070331.

2. Boice, K.L., Alemdar, M., Jackson, J.R., Kessler, T.C., Choi, J., Grossman, S., Usselman, M. Exploring Teachers' Understanding and Implementation of STEAM: One Size Does Not Fit All // *Frontiers in Education*. – 2024. – Vol. 9. – Article 1401191. DOI: 10.3389/feduc.2024.1401191.

3. Camacho-Tamayo, E., Bernal-Ballén, A. Educación STEAM como estrategia pedagógica en la formación docente de ciencias naturales: una revisión sistemática // *Edutec. Revista Electrónica de Tecnología Educativa*. – 2024. – No. 87. DOI: 10.21556/edutec.2024.87.2929.

4. Pabón-Rúa, J.D., López-Ríos, S.Y., Cardona-Zapata, M.E. Theoretical and Methodological Perspectives on Creativity in STEAM Education: A Systematic Review // *Revista Científica*. – 2024. – Vol. 51, No. 3. DOI: 10.14483/23448350.21959.

5. Perignat, E., Katz-Buonincontro, J. STEAM in Practice and Research: An Integrative Literature Review // *Thinking Skills and Creativity*. – 2019. – Vol. 31. – P. 31–43.

6. Voitovska, O., Tolochko, S., Ridei, N. Professional and Pedagogical Culture and Teachers' Professional Competence as Components of their Professionalism // *Journal of Education, Technology and Computer Science*. – 2019. – Vol. 30, No. 4. – P. 241–246. DOI: 10.15584/eti.2019.4.32.

7. Wu, X., Yang, Y., Zhou, X., Xia, Y. et al. A Meta-analysis of Interdisciplinary Teaching Abilities among Elementary and Secondary School STEM Teachers // *International Journal of STEM Education*. – 2024. – Vol. 11. – Article 38. DOI: 10.1186/s40594-024-00500-8.

8. Zhang, C., Jia, B. Enriching STEAM Education with Visual Art: Education Benefits, Teaching Examples, and Trends // *Discover Education*. – 2024. – Vol. 3. – Article 247.

9. UNESCO. STEM Education: Interdisciplinary Approaches to Science, Technology, Engineering and Mathematics Education. – Paris: UNESCO.

10. Radjapova, F. Pedagogik madaniyat tushunchasining didaktik talqini va uning bo‘lajak ingliz tili o‘qituvchisi kasbiy tayyorgarligidagi ahamiyati // *O‘zMU xabarlari*. – 2026. – №1/1.3. DOI: 10.69617/nuuz.v1i1.3.11066.

MATHEMATICAL AND STATISTICAL ANALYSIS OF EXPERIMENTAL WORK AIMED AT DEVELOPING STUDENTS' METAPREVENTIVE COMPETENCE

Ashurova Manzura Djaloldinovna

PhD, Associate Professor, Head of the Department of Communal and occupational Hygiene,

Fergana Medical Institute of Public Health

Muydinova Yoqutxon Giyazidinovna

Department of Communal and Occupational Hygiene Fergana Public Health Medical Institute.

Abstract *Assessing the effectiveness of medical education should not be limited to a qualitative description alone; it is also an important scientific requirement to substantiate its effectiveness through precise mathematical and statistical indicators. In particular, the use of quantitative analysis methods in determining the effectiveness of methodological approaches aimed at developing students' professional competencies within the medical education system ensures the reliability of research findings. From this perspective, providing a mathematical and statistical substantiation of the effectiveness of the methodology based on Reflex-Preventive Modeling Technology, which is aimed at developing the metapreventive competence of students majoring in Preventive Medicine, is of particular scientific significance.*

Keywords: *Professional competencies, industrial hygiene, modeling technology, metapreventive competence, statistical methods, competency-based approach.*

INTRODUCTION

Determining the effectiveness of the pedagogical technology and teaching methodology for developing the metapreventive competence of students majoring in Preventive Medicine within the educational process was identified as one of the priority scientific and practical objectives of this study.

To this end, the impact of the methodology developed on the basis of Reflex-Preventive Modeling Technology on educational outcomes was examined through a comprehensive approach, and the indicators of the experimental and control groups were evaluated using comparative and mathematical-statistical analysis. In this process, the accuracy of students' diagnostic analysis of hygienic situations, their level of identification of harmful factors in the occupational environment, the speed of assessing sanitary and hygienic risks, and the scientific validity of developing preventive decisions were selected as the main assessment criteria. Based on these indicators, the dynamics of changes in students' metapreventive competence were determined, and the practical effectiveness of the methodology was expressed through specific quantitative indicators.

MATERIALS AND METHODS

During the mathematical and statistical analysis, the empirical data collected throughout the experimental study were systematized, and their reliability and level of statistical significance were examined using specialized statistical methods. In this process, the key indicators reflecting students' metapreventive competence—including the accuracy of diagnostic analysis of hygienic situations, the level of identification of sanitary and hygienic risks, the speed of developing preventive decisions, and reflexive assessment

abilities—were quantitatively assessed and processed, followed by a comparative analysis of the experimental and control groups.

During the calculations, the arithmetic mean, variance, standard deviation, and coefficient of variation were determined, and the dynamics of changes in each indicator were evaluated. In addition, the Student's t-test was applied to determine the statistical significance of the differences between the experimental and control groups. Based on the results obtained, the calculated t-values (t_emp) were compared with the critical t-values (t_crit), making it possible to establish that the effectiveness of the methodology was not attributable to random variation but rather to the scientifically grounded pedagogical intervention.

RESULTS

In 2022, 2023, and 2024, the results of the initial and final assessments conducted as part of the experimental study at Fergana Public Health Medical Institute, Andijan State Medical Institute, and Urgench State Medical Institute were summarized, and the effectiveness indicators of the educational and methodological approach were determined based on mathematical and statistical analysis. The results were obtained using recommendations aimed at developing metapreventive competence in future physicians.

Table 3.2.1.

Distribution of Respondents from the Selected Study Sites into Experimental and Control Groups

HEIs	Groups	Number
Fergana Medical Institute of Public Health	EG	78
	CG	77
Andijan State Medical Institute	EG	77
	CG	76
Urgench State Medical Institute	EG	80
	CG	77
Total	EG	235
	CG	230

At the initial stage, a comprehensive diagnostic monitoring system was developed to determine the level of students' proficiency in hygienic diagnostics and preventive activities, as well as the effectiveness of the practical orientation of the educational process. The assessment process was organized on the basis of practical and analytical tasks. Particular attention at this stage was paid not only to students' theoretical knowledge but also to determining the extent to which they had acquired real elements of professional practice related to identifying, analyzing, and assessing sanitary and hygienic situations in the occupational environment.

During the diagnostic assessment process, students were presented with simulated hygienic situations and were required to identify harmful physical, chemical, and biological factors in the occupational environment, assess their compliance with hygienic standards, and provide scientifically grounded explanations of the mechanisms through which these factors affect human health. At the same time, students were required to develop preventive

measures based on the identified problems, predict sanitary and hygienic risks, and select optimal preventive strategies. This made it possible to determine the level of their metapreventive thinking and analytical reasoning.

The analyses showed that although the majority of students were able to explain hygienic concepts correctly at the theoretical level, they experienced difficulties in comprehensively assessing complex situations in the occupational environment, identifying interactions among harmful factors, and systematically substantiating preventive decisions. In particular, it was observed that students' procedural and practical skills were insufficiently developed in interpreting the results of hygienic monitoring, predicting sanitary and hygienic risks, and developing preventive models.

DISCUSSION

Furthermore, the results of the initial stage indicated that the practical orientation of the educational process was not sufficiently ensured. In the traditional teaching process, students were primarily focused on acquiring ready-made knowledge, while activities related to analyzing and managing real-life hygienic situations were implemented only to a limited extent. As a result, it was established that important components of students' metapreventive competence—namely, hygienic thinking, risk analysis, and preventive decision-making skills—were not sufficiently developed. During the study, students' preparedness was assessed not only at the level of theoretical knowledge but also through situations closely resembling real clinical practice. For this purpose, hygienic clinical scenarios, problem-based cases, simulation tasks, and practical exercises were employed, requiring students to analyze symptoms, select appropriate diagnostic examinations, substantiate diagnoses, and develop treatment strategies. Thus, their clinical reasoning processes and decision-making mechanisms were assessed under practical conditions. A specialized system of assessment criteria was

developed to determine the students' level of proficiency. These criteria included such indicators as the logical coherence of diagnostic reasoning, the accuracy of interpreting laboratory and instrumental findings, the ability to conduct differential diagnosis, the validity of therapeutic decisions, and the consistency of procedural actions. Each indicator was classified into three levels—high, medium, and low—thereby establishing the students' initial level of preparedness.

The analyses showed that although most students had sufficient knowledge of theoretical information, they experienced difficulties in applying this knowledge systematically in complex clinical situations, establishing priorities, and developing independent decisions. This finding provided a scientific rationale for the insufficiency of the traditional lecture–practical approach in teaching Occupational Hygiene and demonstrated the need to introduce interactive, scenario-based, and simulation-based methods.

Table 3.2.2.

Results of the Initial Assessment of the Level of Development of Metapreventive Competence among Preventive Medicine Students Based on RPMT Technology

HEIs	Criteria	Groups	Number	High	Medium	Low
Fergana Medical Institute of Public Health	**Motivational**	EG	78	6	17	55
		CG	77	7	15	55
	Cognitive	EG	78	5	17	56

		CG	77	6	15	56
	Activity-Based	EG	78	6	16	56
		CG	77	7	14	56
Andijan State Medical Institute	**Motivational**	EG	77	6	16	55
		CG	76	5	17	54
	Cognitive	EG	77	6	17	54
		CG	76	6	17	53
	Activity-Based	EG	77	5	16	56
		CG	76	6	14	56
Urgench State Medical Institute	**Motivational**	EG	80	6	16	58
		CG	77	5	18	54
	Cognitive	EG	80	5	17	58
		CG	77	5	16	56
	Activity-Based	EG	80	6	15	59
		CG	77	5	17	55
All Educational Institutions	**Motivational**	EG	235	18	49	168
		CG	230	17	50	163
	Cognitive	EG	235	16	51	168
		CG	230	17	48	165
	Activity-Based	EG	235	17	47	171
		CG	230	18	45	167

CONCLUSIONS

At the initial substantiating stage, based on the aims and objectives of the study, the following results were obtained from the initial experimental study conducted to determine the level of development of metapreventive competence among students majoring in Preventive Medicine based on RPMT technology:

According to the motivational criterion, the proportion of students demonstrating a high level of achievement was 7.7% in the experimental groups and 7.4% in the control groups. The proportion demonstrating a medium level of achievement was 20.9% in the experimental groups and 21.7% in the control groups, while the proportion demonstrating a low level of achievement was 71.5% and 70.9%, respectively.

According to the cognitive criterion, the proportion of students demonstrating a high level of achievement was 6.8% in the experimental groups and 7.4% in the control groups. The proportion demonstrating a medium level of achievement was 21.7% in the experimental groups and 20.9% in the control groups, while the proportion demonstrating a low level of achievement was 71.5% and 71.7%, respectively.

According to the activity-based criterion, the proportion of students demonstrating a high level of achievement was 7.2% in the experimental groups and 7.8% in the control groups. The proportion demonstrating a medium level of achievement was 20.0% in the experimental groups and 19.6% in the control groups, while the proportion demonstrating a low level of achievement was 72.8% and 72.6%, respectively.

REFERENCES

1. Baydjanov B.X. Methodology of pedagogical science and its axiological possibilities // American Journal of Social and Humanitarian Research. 2025. Vol. 3, No. 10. P. 170. DOI: https://doi.org/10.31150/10.1622

2. Markwell K.E., Ross L.J., Mitchell L.J., Williams L.T. A self-determination theory analysis of reflective debrief themes about dietetic student placement experiences

in hospital: implications for education // Journal of Human Nutrition and Dietetics. 2021. Vol. 34, No. 1. P. 115–123. DOI: https://doi.org/10.1111/.12808

3. Ashurova M.D., Muydinova Y., Atadjanova D., Muhammadova G., Ismoilov D. Pedagogical efficiency of integrated learning in the organization of hygiene classes in medical universities // BIO Web of Conferences. 2023. Vol. 65. Art. 10016. DOI: https://doi.org/10.1051/bioconf/20236510016

4. Muydinova Y.G. Pedagogical and psychological aspects of teaching occupational hygiene to preventive medicine students // Eureka Journal of Health Sciences & Medical Innovation (EJHSMI). 2026. Vol. 2, No. 5. P. 360–367. ISSN 2760-4942 (Online). URL: https://eurekaoa.com/index.php/5

ПРОФЕССИОНАЛЬНАЯ РЕЗИЛЬЕНТНОСТЬ ПРЕПОДАВАТЕЛЯ ВЫСШЕЙ ШКОЛЫ В УСЛОВИЯХ ТРАНСФОРМАЦИИ ОБРАЗОВАТЕЛЬНОЙ СРЕДЫ

Хушвакова Елена Маратовна

Филиал РГПУ им. А.И. Герцена в городе Ташкенте,

соискатель учёной степени (PhD)

Международный центр образования по переподготовке кадров и повышению квалификации NEW WAY, педагог-психолог

mail: elena.hushvakova@mail.ru

***Аннотация**: В статье рассматривается профессиональная резильентность преподавателя высшей школы как динамическая характеристика, связанная со способностью адаптироваться к изменяющимся требованиям образовательной среды, сохранять профессиональную направленность и эмоциональную устойчивость. Актуальность проблемы определяется цифровизацией, распространением смешанного и дистанционного обучения, внедрением генеративного искусственного интеллекта и ростом профессиональных требований. Показана связь резильентности с профессиональными ресурсами и профилактикой выгорания.*

***Ключевые слова:** профессиональная резильентность, преподаватель высшей школы, образовательная среда, цифровизация, эмоциональное выгорание, профессиональные ресурсы, адаптация.*

***Abstract**: The article examines the professional resilience of higher education teachers as a dynamic characteristic related to adaptation to changing educational demands, preservation of professional orientation, and emotional stability. The relevance of resilience research is associated with digitalization, blended and online learning, generative artificial intelligence, and increasing professional requirements. The relationship between resilience, professional resources, and burnout prevention is discussed.*

***Keywords:** professional resilience, higher education teacher, educational environment, digitalization, burnout, professional resources, adaptation.*

ВВЕДЕНИЕ

Цифровизация, искусственный интеллект, новые форматы обучения и рост требований к качеству образования требуют постоянной адаптации профессиональных способов работы. В этих условиях возрастает значение способности преподавателя сохранять мотивацию и эмоциональное равновесие. Исследования показывают, что профессиональная резильентность не является фиксированным личностным качеством, а формируется во взаимодействии специалиста с профессиональной и социальной средой (Gu, Day, 2007; Mansfield et al., 2012). Цель статьи — теоретически обосновать значение профессиональной резильентности преподавателя высшей школы и систематизировать ее основные компоненты.

Современный преподаватель совмещает учебные и научные функции с цифровыми и организационными задачами. Использование генеративного ИИ актуализирует вопросы педагогически обоснованного применения технологий, академической добросовестности и изменения роли преподавателя (Miao, Holmes, 2023). Согласно модели «требования–ресурсы работы», профессиональное напряжение определяется соотношением рабочих требований и доступных ресурсов (Bakker, Demerouti, 2007). Поэтому профессиональную резильентность целесообразно рассматривать как динамический процесс мобилизации

личностных, профессиональных и социальных ресурсов, а не как способность выдерживать любую нагрузку. Gu и Day связывают ее с сохранением профессиональной приверженности, эффективности и благополучия в условиях изменений (Gu, Day, 2007). Систематический обзор Lu et al. также подчеркивает взаимодействие профессиональных требований и ресурсов (Lu et al., 2024). В данной статье профессиональная резильентность преподавателя высшей школы понимается как динамическая характеристика, обеспечивающая сохранение продуктивности, эмоциональной устойчивости и профессиональной направленности при изменении требований образовательной среды.

Компоненты профессиональной резильентности

Теоретический анализ позволяет выделить шесть взаимосвязанных компонентов профессиональной резильентности. Когнитивный отражает способность анализировать изменения, находить решения, осваивать новые знания и критически оценивать технологии. Эмоционально-регуляторный связан с распознаванием и регулированием эмоциональных состояний, поддержанием устойчивости и восстановлением. Мотивационно-ценностный включает профессиональную мотивацию, осознание смысла деятельности и готовность к развитию. Поведенческо-деятельностный проявляется в планировании, управлении временем, гибкости профессионального поведения и обращении за помощью. Социально-коммуникативный компонент охватывает конструктивное взаимодействие со студентами и коллегами, а также использование социальной поддержки как профессионального ресурса (Mansfield et al., 2012). Рефлексивный компонент обеспечивает анализ опыта, распознавание перегрузки, оценку эффективности стратегий и их своевременную коррекцию. Компоненты взаимосвязаны и совместно обеспечивают адаптацию преподавателя к изменяющимся требованиям

профессиональной среды. Таким образом, резильентность представляет собой целостную динамическую систему ресурсов и способов их использования.

Резильентность и профилактика эмоционального выгорания

Резильентность и выгорание не тождественны: выгорание связано с хроническим рабочим стрессом и неблагоприятными условиями труда, тогда как резильентность отражает адаптационные ресурсы человека (Maslach, Leiter, 2016). В академической среде профессиональное благополучие также испытывает влияние различных стрессоров (Urbina-Garcia, 2020). Поэтому развитие резильентности следует рассматривать как профилактическое направление наряду с поддерживающей организационной средой.

Педагогические механизмы формирования резильентности

Если резильентность понимается как динамическая характеристика, возможно создание условий для ее развития. К потенциально значимым механизмам относятся развитие эмоциональной саморегуляции, обучение конструктивному совладанию со стрессом, формирование навыков управления профессиональной нагрузкой, взаимное профессиональное обучение и поддержка коллег. Их задача состоит не в устранении всех стрессоров, а в расширении способности преподавателя гибко реагировать на изменения, использовать доступные ресурсы и своевременно восстанавливать профессиональное функционирование.

ЗАКЛЮЧЕНИЕ

Профессиональная резильентность преподавателя высшей школы представляет собой динамическую систему, формирующуюся во взаимодействии личностных ресурсов и требований образовательной среды. Ее значение возрастает в условиях цифровизации, внедрения ИИ, изменения форм обучения и роста профессиональной нагрузки.

В рамках теоретической модели выделены шесть взаимосвязанных компонентов: когнитивный, эмоционально-регуляторный, мотивационно-ценностный, поведенческо-деятельностный, социально-коммуникативный и рефлексивный. Дальнейшее исследование предполагает их эмпирическую проверку, разработку диагностических критериев и создание программы формирования профессиональной резильентности преподавателей высшей школы.

ЛИТЕРАТУРА

Bakker, A. B., & Demerouti, E. (2007). The Job Demands–Resources model: State of the art. Journal of Managerial Psychology, 22(3), 309–328. https://doi.org/10.1108/02683940710733115

Gu, Q., & Day, C. (2007). Teachers resilience: A necessary condition for effectiveness. Teaching and Teacher Education, 23(8), 1302–1316. https://doi.org/10.1016/j.tate.2006.06.006

Lu, J., Chen, J., Li, Z., & Li, X. (2024). A systematic review of teacher resilience: A perspective of the job demands and resources model. Teaching and Teacher Education, 151, 104742. https://doi.org/10.1016/j.tate.2024.104742

Mansfield, C. F., Beltman, S., Price, A., & McConney, A. (2012). “Don’t sweat the small stuff”: Understanding teacher resilience at the chalkface. Teaching and Teacher Education, 28(3), 357–367. https://doi.org/10.1016/j.tate.2011.11.001

Maslach, C., & Leiter, M. P. (2016). Understanding the burnout experience: Recent research and its implications for psychiatry. World Psychiatry, 15(2), 103–111. https://doi.org/10.1002/wps.20311

Miao, F., & Holmes, W. (2023). Guidance for generative AI in education and research. UNESCO. https://doi.org/10.54675/EWZM9535

Urbina-Garcia, A. (2020). What do we know about university academics’ mental health? A systematic literature review. Stress and Health, 36(5), 563–585. https://doi.org/10.1002/smi.2956

7-SECTION

IJTIMOIY ADOLATNING SIYOSIY VA HUQUQIY ASOSLARI

Mamatqobilov Tursunmurat Daniyorovich

O‘zbekiston jahon tillari universiteti

Siyosiy fanlar kafedrasi dotsenti, s.f.n.

Annotatsiya: *Mazkur maqolada Ijtimoiy davlatning strategiyasida belgilangan vazifalar, fuqarolik institutlarining ijtimoiy himoya siyosatini amalga oshirishdagi faoliyatlari, mahalla insstituti va xalqaro tashkilotlarning roli tahlil qilingan.*

Kalit iboralar: *Ijtimoiy davlat, ijtimoiy siyosat, strategiya, mahalla instituti, nodavlat notijorat tashkilotlar, xalqaro tashkilotlar, o‘zaro hamkorlik, ligitimlik.*

Аннотация: *В данной статье анализируются задачи, поставленные в Стратегии социального государства, деятельность гражданских институтов по реализации политики социальной защиты, роль института махалла и международных организаций.*

Ключевые слова: *социальное государство, социальная политика, стратегия, институт махалла, неправительственные некоммерческие организации, международные организации, сотрудничество, легитимность.*

Abstract: *This article analyzes the objectives outlined in the social state strategy, the activities of civil society institutions in implementing social protection policies, and the roles of the *mahalla* institution and international organizations.*

Keywords: *Social state, social policy, strategy, *mahalla* institution, non-governmental non-profit organizations, international organizations, cooperation, legitimacy.*

KIRISH

Ijtimoiy siyosatni baholashda adolat tushunchasi amaliy jihatdan markaziy mezonga aylantirilishi zarur. Bu degani, ya’ni adolatlilik faqat teng taqsimlashgina emas, balki ayrim guruhlar boshqalarga nisbatan ko‘proq qo‘llab-quvvatlashga muhtoj bo‘lishi mumkin. Shuning uchun ijtimoiy adolat “hamma uchun bir xil” mexanik yondashuv emas, balki “ehtiyojga mos,

imkoniyatni tenglashtiruvchi va inson qadrini saqlovchi" yondashuv hisoblanadi.

O‘zbekiston Respublikasi Konstitutsiyasining 14-moddasida davlat o‘z faoliyatini inson farovonligini va jamiyatning barqaror rivojlanishini ta’minlash maqsadida ijtimoiy adolat va birdamlik prinsiplariga asoslanib amalga oshirishi belgilangan.[26] Ijtimoiy siyosat ko‘p idorali tizim bo‘lgani sababli uning samaradorligi vazirliklar, agentliklar, mahalliy hokimiyat, mahalla, NNT va xizmat ko‘rsatuvchi tashkilotlar o‘rtasidagi hamkorlik darajasiga bog‘liq. Agar bir idora yordam belgilasa, ikkinchisi xizmat ko‘rsatsa, uchinchisi ma’lumot yuritsa, to‘rtinchisi nazorat qilsa, ular o‘rtasida aniq ma’lumot almashish va javobgarlik bo‘lmasa, fuqaro tizim e’tiboridan chetda qolishi mumkin.Institutsional muvofiqlik shu xavfni kamaytiradi. Northning institutlar haqidagi nazariyasi rasmiy qoidalar bilan ijro amaliyoti o‘rtasidagi muvofiqlik ijtimoiy natijalar uchun hal qiluvchi ekanini ko‘rsatadi.

Institutsional muvofiqlik mezoni O‘zbekiston sharoitida ayniqsa dolzarb. "Inson" markazlari modelining siyosiy-institutsional qiymati shundaki, u fuqaroni turli idoralar o‘rtasida ortiqcha ma’muriy harakatlarga majbur etmasdan, xizmatlarni bir joyda integratsiyalashga intiladi. Ijtimoiy himoya milliy agentligi rasmiy saytida "Inson" markazlari, ijtimoiy karta, ijtimoiy sug‘urta va ochiq ma’lumotlar yo‘nalishlari mavjudligi tizimning raqamli va institutsional integratsiyaga o‘tishini ko‘rsatadi.[27] Biroq bu modelning haqiqiy samaradorligi markazlar soni bilan emas, murojaatlarni hal qilish sifati, vaqt, shaffoflik, takroriy hujjat talab qilinmasligi va fuqarolarning qoniqish darajasi bilan o‘lchanishi kerak.

[26] O‘zbekiston Respublikasi Konstitutsiyasi. 2023-yil 30-aprel. 14-modda. Qonunchilik ma’lumotlari milliy bazasi: https://lex.uz/docs/6445145 (murojaat qilingan sana: 2025.05.24).

[27] O‘zbekiston Respublikasi Prezidenti huzuridagi Ijtimoiy himoya milliy agentligi rasmiy sayti. "Xizmatlar", "Ochiq ma’lumotlar", "Statistika", "Baraka – barcha imtiyozlaringiz endi bitta kartada!" bo‘limlari. URL: https://ihma.uz/oz/ (murojaat qilingan sana: 2026.02.28).

Ijtimoiy siyosat qog‘ozda mavjud bo‘lishi mumkin, lekin fuqaro unga real kira olmasa, u amalda samarali emas. Foydalanish imkoniyati geografik masofa, transport, raqamli savodxonlik, hujjat talabi, til, nogironlikka mos infratuzilma, ijtimoiy xodimlar yetarliligi va ma’lumotning tushunarliligi bilan bog‘liq. Ijtimoiy xizmatlar fuqaro uchun qanchalik sodda, tushunarli va hurmatli bo‘lsa, davlatga ishonch shunchalik yuqori bo‘ladi. Ana shu bois xizmatga yaqinlik ijtimoiy siyosatning nafaqat ma’muriy, balki siyosiy mezonidir.

Foydalanish imkoniyati mezonida raqamlashtirish ikki tomonlama baholanishi kerak. Bir tomondan, raqamli platformalar shaffoflik, tezlik va ma’lumotlar integratsiyasini kuchaytiradi. Ikkinchi tomondan, internetga kirish, raqamli savodxonlik yoki texnik imkoniyat past bo‘lgan guruhlar raqamli tizimdan chetda qolishi mumkin. Shu sababli ijtimoiy siyosatda “digital by default” emas, “digital plus human support” yondashuvi zarur. Bunda raqamli xizmatlar inson xodimni almashtirmaydi, balki uning qarorini tezlashtiradi, xatoliklarni kamaytiradi va fuqaroga qulaylik yaratadi. UNDP inson taraqqiyoti yondashuvida texnologiyalar inson tanlovi va imkoniyatlarini kengaytirishiga xizmat qilishi kerakligini ta’kidlaydi.[28]

Ijtimoiy siyosatning samaradorligi faqat bir yil ichidagi natija bilan emas, uning uzoq muddatli moliyaviy bardoshliligi bilan ham o‘lchanadi. Agar dastur vaqtinchalik mablag‘ga tayanib qolsa, iqtisodiy bosim kuchayganda eng zaif guruhlar yana himoyasiz qolishi mumkin. Moliyaviy barqarorlik budjet intizomi, ijtimoiy sug‘urta, mahalliy resurslar, donor mablag‘laridan oqilona foydalanish va natijaga asoslangan xarajatlar tahlili bilan bog‘liq. ILO (Xalqaro mehnat tashkiloti) ijtimoiy himoya pollarini milliy sharoit, moliyaviy imkoniyat va

[28] UNDP. Human Development Report 2025: A matter of choice: People and possibilities in the age of AI. New York: UNDP, 2025. Official citation page and overview. URL: https://hdr.undp.org/content/human-development-report-2025 (murojaat qilingan sana: 2025.06.03).

xalqaro majburiyatlar bilan uyg‘un tarzda bosqichma-bosqich kengaytirishni tavsiya etadi.[29]

Ijtimoiy siyosatning siyosiy-institutsional samaradorligi fuqarolar, OAV, NNT, mahalla faollari va parlament nazorati orqali mustahkamlanadi. Hisobdorlik bo‘lmagan tizimda yaxshi dasturlar ham byurokratik yopiq mexanizmga aylanib qolishi mumkin. O‘zbekiston Konstitutsiyasida davlat organlari va mansabdor shaxslar jamiyat va fuqarolar oldida mas’ul ekani qonunan belgilab qo‘yilgan. Bu tamoyil ijtimoiy siyosatga ham to‘liq taalluqlidir: har bir ijtimoiy dastur fuqaroga tushunarli, ma’lumotlari ochiq va shikoyat mexanizmi ishlaydigan bo‘lishi kerak.

Jamoatchilik nazoratining amaliy indikatorlari sifatida ochiq ma’lumotlar portallari, ijtimoiy dasturlar budjeti, qamrov statistikasi, murojaatlar va shikoyatlar tahlili, mustaqil baholash hisobotlari, parlament eshituvlari va fuqarolar qoniqishi so‘rovlari ko‘rib chiqiladi. Bunda faqat ijobiy hisobotlar emas, kamchiliklarni ochiq tan olish va tuzatish mexanizmi ham muhimdir. Ijtimoiy siyosatda xato bo‘lishi mumkin; lekin siyosiy-institutsional sifat xatoni yashirishda emas, uni aniqlash, tahlil qilish va bartaraf etishda namoyon bo‘ladi.

Raqamli monitoring ijtimoiy siyosatni real vaqtga yaqin kuzatish, ehtiyojmandlarni aniqlash, xizmatlar takrorlanishini kamaytirish, korrupsion xavflarni pasaytirish va natijalarni hududlar kesimida taqqoslash imkonini beradi. “O‘zbekiston — 2030” strategiyasida tibbiyot sohasida raqamli texnologiyalarni keng joriy qilish va ijtimoiy xizmatlar tizimini takomillashtirish vazifalari alohida ko‘rsatilgan.[30] Biroq raqamli monitoringning o‘zi ham

[29] International Labour Organization. Social Protection Floors Recommendation, 2012 (No. 202). Geneva: ILO, 2012. – Paras. 3–5, 13–14.

[30] O‘zbekiston Respublikasi Prezidentining 2023-yil 11-sentabrdagi PF–158-son Farmoni. “O‘zbekiston — 2030” strategiyasi to‘g‘risida. 1.2-bo‘lim, 21-band; 1.3-bo‘lim, 22-band. Qonunchilik ma’lumotlari milliy bazasi: https://lex.uz/docs/6600413 (murojaat qilingan sana: 2026.06.11).

baholanishi kerak: ma’lumotlar yangiligi, to‘liqligi, maxfiylik, himoya, algoritmik adolatlilik va insoniy qaror bilan uyg‘unlik shart.

Raqamli monitoringda ma’lumotlar sifati masalasi hal qiluvchi ahamiyatga ega. Noto‘g‘ri yoki eskirgan ma’lumot asosida chiqarilgan qaror ijtimoiy adolatsizlikka olib kelishi mumkin. Masalan, oilaning daromadi, sog‘liq holati, bandlik vaziyati yoki nogironlik bilan bog‘liq ehtiyojlar tez o‘zgaradi; agar tizim bu o‘zgarishni ko‘rmasa, yordam noto‘g‘ri yo‘naltiriladi. Shu sababli raqamli monitoring mahalla va ijtimoiy xodimlar tomonidan real holatni tekshirish, fuqarolar uchun apellyatsiya imkoniyati va mustaqil audit mexanizmlari bilan birga ishlashi lozim. Ma’lumotlar bazasi inson hayotini soddalashtirishi, uni yana bir byurokratik to‘siqqa aylantirmasligi kerak.

O‘ninchi mezon — natijadorlik va ta’sirdir. Natijadorlik qisqa va o‘rta muddatli maqsadlarning bajarilishini bildiradi; ta’sir esa ijtimoiy siyosatning uzoq muddatli o‘zgarishlarga qo‘shgan hissasini anglatadi. [31] Demak, qisqa muddatli natija — ehtiyojmand oilaga yordam ajratilishi; o‘rta muddatli natija — oilaning barqaror daromad manbaiga ega bo‘lishi; uzoq muddatli ta’sir — bolalarning ta’limda davom etishi, kambag‘allikning avlodlararo uzatilishi kamayishi va ijtimoiy ishonch ortishidir. OECD-DAC (donor davlatlar birlashmasi) mezonlarida “impact” siyosat yoki dastur natijasida yuzaga kelgan ijobiy va salbiy, kutilgan va kutilmagan, bevosita va bilvosita uzoq muddatli ta’sirlarni o‘rganishga qaratiladi.

[31] OECD. Better Criteria for Better Evaluation: Revised Evaluation Criteria Definitions and Principles for Use. OECD/DAC Network on Development Evaluation, 2019. – P. 8–12.

IJTIMOIY DAVLATDA FUQAROLIK INSTITUTLARINING HUQUQIY MAQOMI

Mamatqobilov Tursunmurat Daniyorovich

O‘zbekiston jahon tillari universiteti

Siyosiy fanlar kafedrasi dotsenti, s.f.n.

Annotatsiya: *Mazkur maqolada Ijtimoiy davlatning istiqboldagi strategiyasida belgilangan prinsiplari orqali fuqarolik institutlarining ijtimoiy himoya siyosatini amalga oshirishdagi faoliyatlari tahlil etilgan.*

Kalit iboralar: *Ijtimoiy davlat, ijtimoiy siyosat, strategiya, jamoat tashkilotlari, nodavlat notijorat tashkilotlar, moliyalash, standartlash, xayriya tashkilotlari, huquqiy asoslar.*

Аннотация: *В данной статье анализируется деятельность гражданских институтов по реализации политики социальной защиты на основе принципов, изложенных в будущей стратегии социального государства.*

Ключевые слова: *социальное государство, социальная политика, стратегия, общественные организации, неправительственные некоммерческие организации, финансирование, стандартизация, благотворительные организации, правовая база.*

Abstract: *This article analyzes the activities of civil society institutions in implementing social protection policies, viewed through the principles outlined in the future strategy of the social state.*

Keywords: *Social state, social policy, strategy, public organizations, non-governmental non-profit organizations, financing, standardization, charitable organizations, legal foundations.*

KIRISH

Davlat va fuqarolik jamiyati institutlari o‘rtasidagi hamkorlik ham kuchli ijtimoiy himoya tamoyilining sifat ko‘rsatkichidir. NNTlar, xayriya tashkilotlari, mahalliy tashabbuslar, professional uyushmalar va volontyorlik harakatlari davlat xizmatlarini to‘ldirishi, muayyan guruhlar bilan ishlashda moslashuvchanlik yaratishi mumkin. Biroq bu hamkorlik davlat majburiyatlarini

xususiy tashabbuslarga topshirib qo‘yish degani emas. Aksincha, davlat asosiy kafolatlar, moliyalashtirish va standartlar uchun mas’ul bo‘lib qoladi; fuqarolik jamiyati esa ehtiyojni aniqlash, xizmatni moslashtirish, monitoring va ijtimoiy innovatsiyalar bo‘yicha qo‘shimcha salohiyat va imkoniyat yaratadi.

Shunday qilib, O‘zbekiston ijtimoiy siyosati evolyutsiyasi “kuchli ijtimoiy himoya” tamoyilining ichki mazmuni tobora murakkablashib borayotganini ko‘rsatadi. Dastlab bu tamoyil ijtimoiy inqirozning oldini olishga qaratilgan himoya mexanizmi bo‘lgan bo‘lsa, keyingi bosqichlarda u huquqiy kafolatlar, mahalla orqali manzillilik, sektorlararo dasturlar, xalq bilan muloqot, yagona reyestr, professional ijtimoiy xizmat, raqamli monitoring va konstitutsiyaviy ijtimoiy davlat prinsiplarini o‘z ichiga olgan kompleks siyosiy institutga aylandi. O‘zbekiston tajribasida ijtimoiy himoya davlatning chekka ijtimoiy funksiyasi emas, balki siyosiy barqarorlik, ijtimoiy adolat, inson kapitali va davlat legitimligini birlashtiruvchi markaziy institut sifatida shakllangan.[32]

O‘zbekistonda kuchli ijtimoiy himoya tamoyili tarixan uch vazifani bajargan: birinchidan, bozor islohotlarining ijtimoiy oqibatlarini yumshatgan; ikkinchidan, davlat va fuqaro o‘rtasidagi ishonchni saqlab qolgan; uchinchidan, bugungi ijtimoiy davlat modelining huquqiy-institutsional asoslarini tayyorlagan. Shu sababdan mazkur tamoyilni faqat mustaqillikning dastlabki davriga xos siyosiy shior sifatida emas, balki O‘zbekiston ijtimoiy siyosatining evolyutsion yadrosi sifatida baholash lozim. Bugungi bosqichda esa bu tamoyil “kuchli ijtimoiy himoya”dan “professional, manzilli, raqamli va natijador ijtimoiy davlat” modeliga o‘tmoqda.

O‘zbekistonda kuchli ijtimoiy himoya tamoyili — bu mustaqillik sharoitida bozor islohotlari, davlat qurilishi va jamiyat barqarorligini

[32] O‘zbekiston Respublikasi Konstitutsiyasi, 1, 2 va 14-moddalar; O‘zbekiston Respublikasi Prezidentining 2023-yil 11-sentabrdagi PF-158-son Farmoni, 22–27-maqsadlar. https://lex.uz/docs/6600413 (murojaat qilingan sana: 2026.06.11).

uyg‘unlashtirish maqsadida shakllangan, keyinchalik pensiya, mehnat, mahalla, bandlik, ijtimoiy nafaqa, yagona reyestr, professional ijtimoiy xizmat va konstitutsiyaviy ijtimoiy davlat prinsipi orqali institutsionallashgan kompleks siyosiy-huquqiy mexanizmdir. Mazkur ta’rif keyingi paragraflarda O‘zbekistonning konstitutsiyaviy-huquqiy va strategik asoslarini chuqur tahlil qilish uchun metodologik asos bo‘lib xizmat qiladi.

Ijtimoiy davlat prinsipining konstitutsiyaviy-huquqiy maqomi siyosiy fanlar nuqtayi nazaridan tahlil qilinadi. Ya’ni ijtimoiy davlat g‘oyasi deklarativ qoida yoki qadriyat sifatida emas, balki davlat organlari, mahalliy boshqaruv, ijtimoiy xizmatlar tizimi va jamoatchilik nazorati uchun aniq majburiyatlar majmui sifatida ochib beriladi.

Konstitutsiyaviy norma, strategik hujjatlar va amaliy ijtimoiy xizmatlar o‘rtasidagi bog‘liqlikni ko‘rsatadi. Shu orqali tadqiqot O‘zbekistonda ijtimoiy davlat modelining huquqiy asosdan institutsional ijro mexanizmiga o‘tish jarayonini dalillaydi.

Yangi O‘zbekiston sharoitida “ijtimoiy davlat” prinsipining konstitutsiyaviy-huquqiy va strategik asoslarini tahlil qilish ijtimoiy siyosatni oddiy yordam berish tizimi sifatida emas, balki davlatning mazmuni, legitimligi, boshqaruv mas’uliyati va fuqarolik huquqlari bilan uzviy bog‘langan siyosiy institut sifatida ko‘rishni talab qiladi. 2023-yilda yangi tahrirda qabul qilingan Konstitutsiyada O‘zbekiston “suveren, demokratik, huquqiy, ijtimoiy va dunyoviy davlat” sifatida belgilanishi mazkur masalaning nazariy maqomini tubdan o‘zgartirdi.[33] Endilikda ijtimoiy himoya alohida dastur yoki vaqtinchalik kompensatsion chora emas, balki konstitutsiyaviy davlat qurilishining tarkibiy belgilaridan biri sifatida qaraladi. Bu esa ijtimoiy siyosatni davlat hokimiyati

[33] O‘zbekiston Respublikasi Konstitutsiyasi. 2023-yil 30-aprel. 1-modda. Qonunchilik ma’lumotlari milliy bazasi: https://lex.uz/docs/6445145 (murojaat qilingan sana: 2025.05.24).

institutlari faoliyatining chekka vazifasi emas, davlat-fuqaro munosabatlarining markaziy o‘lchovi sifatida baholash imkonini beradi.

“Ijtimoiy davlat” prinsipining huquqiy matnda e’lon qilinishi bilan amaliy siyosatdagi institutsional mexanizmlari o‘rtasidagi bog‘liqlikni ochib berishdan iborat. Chunki ijtimoiy davlat prinsipi faqat Konstitutsiya matnida mavjud bo‘lishi bilan avtomatik ravishda samarali ishlamaydi. U bir necha qatlam orqali hayotga tatbiq etiladi: birinchisi — inson huquqlarini kafolatlovchi konstitutsiyaviy normalar; ikkinchisi — ijtimoiy himoya, bandlik, pensiya, ta’lim, sog‘liqni saqlash va ijtimoiy xizmatlarni tartibga soluvchi qonunchilik; uchinchisi — strategik hujjatlar, davlat dasturlari va maqsadli ko‘rsatkichlar; to‘rtinchisi — ushbu siyosatni amalga oshiruvchi institutlar, mahalla, “Inson” markazlari, ijtimoiy xodimlar, raqamli reyestrlar va ochiq monitoring tizimlari bilan izohlanadi.

Konstitutsiyaviy-huquqiy tahlilda “ijtimoiy davlat” tushunchasi uchta asosiy ma’noni bildiradi. Birinchidan, u davlatning fuqarolar oldidagi passiv neytralligini emas, faol ijtimoiy mas’uliyatini anglatadi. Davlat faqat tartibni saqlovchi yoki soliqlarni yig‘uvchi tashkilot bo‘lib qolmaydi; u inson farovonligi, ijtimoiy adolat, birdamlik va barqaror rivojlanish uchun mas’ul siyosiy institutga aylanadi. Ikkinchidan, ijtimoiy davlat fuqarolarni faqat huquqiy tenglik bilan cheklamaydi, balki real imkoniyatlar tengligini ta’minlashga harakat qiladi. Uchinchidan, ijtimoiy davlat o‘z faoliyatini faqat iqtisodiy o‘sish ko‘rsatkichlari bilan emas, inson kapitali, ijtimoiy qo‘shilish, zaif qatlamlarni qo‘llab-quvvatlash va jamiyatda ishonchni mustahkamlash mezonlari bilan ham baholaydi.[34]

O‘zbekiston Konstitutsiyasining 1-moddasida “ijtimoiy davlat” atamasining bevosita kiritilishi ijtimoiy siyosatga normativ ustuvorlik beradi. Bu

[34] Marshall T.H. Citizenship and Social Class and Other Essays. Cambridge: Cambridge University Press, 1950. – P. 10–27; Sen A. Development as Freedom. Oxford: Oxford University Press, 1999. – P. 87–110.

modda davlatning siyosiy-huquqiy tabiatini belgilaydi va barcha keyingi qonunlar, strategiyalar hamda davlat boshqaruvi qarorlari uchun konstitutsiyaviy mezon vazifasini bajaradi.[35] Shu jihatdan ijtimoiy davlat prinsipi Konstitutsiyadagi alohida ijtimoiy huquqlarning yig‘indisidan kengroq hodisadir. U mehnat, ta’lim, tibbiyot, ijtimoiy ta’minot, uy-joy, nogironligi bo‘lgan shaxslar va ehtiyojmand toifalar huquqlarini yagona siyosiy falsafa — inson farovonligi va ijtimoiy adolat falsafasi ostida birlashtiradi.

Konstitutsiyaning 2-moddasi ham ijtimoiy davlatni anglashda muhim metodologik asos beradi. Unda davlat xalq irodasini ifoda etishi, uning manfaatlariga xizmat qilishi, davlat organlari va mansabdor shaxslar jamiyat hamda fuqarolar oldida mas’ul ekani belgilangan.[36] Bu norma ijtimoiy siyosatni xayriya yoki ma’muriy saxovat emas, balki xalq manfaatlariga xizmat qilishning konstitutsiyaviy shakli sifatida talqin qilishga imkon beradi. Boshqacha aytganda, davlatning ijtimoiy majburiyatlari fuqaroga “yuqoridan beriladigan imtiyoz” emas, davlat hokimiyatining konstitutsiyaviy mas’uliyatidir.

Ayniqsa, Konstitutsiyaning 14-moddasi “ijtimoiy davlat”ning ichki tamoyillarini ochib beradi. Mazkur moddada davlat o‘z faoliyatini inson farovonligi va jamiyatning barqaror rivojlanishini ta’minlash maqsadida qonuniylik, ijtimoiy adolat va birdamlik prinsiplari asosida amalga oshirishi belgilangan.[37] Bu yerda uchta kalit tushuncha mavjud: qonuniylik, ijtimoiy adolat va birdamlik. Qonuniylik ijtimoiy yordamning aniq huquqiy tartibga ega bo‘lishini, ijtimoiy adolat yordam va imkoniyatlarning adolatli taqsimlanishini, birdamlik esa jamiyatning kuchli qatlamlari zaif qatlamlarga nisbatan

[35] O‘zbekiston Respublikasi Konstitutsiyasi. 1-modda. https://lex.uz/docs/6445145 (murojaat qilingan sana: 2025.05.24).

[36] O‘zbekiston Respublikasi Konstitutsiyasi. 2-modda. https://lex.uz/docs/6445145 (murojaat qilingan sana: 2025.05.24).

[37] O‘zbekiston Respublikasi Konstitutsiyasi. 14-modda. https://lex.uz/docs/6445145 (murojaat qilingan sana: 2025.05.24).

mas'uliyatini anglatadi. Shu sababdan Konstituttsiyaning 14-moddasida ijtimoiy davlatni faqat iqtisodiy resurslar bilan emas, siyosiy-axloqiy tamoyillar bilan ham bog‘laydi.

Ijtimoiy adolat tushunchasining konstitutsiyaviy darajaga ko‘tarilishi davlat siyosatida tenglik va farqni bir vaqtda hisobga olishni talab qiladi. Rawlsning adolat nazariyasida ijtimoiy-iqtisodiy tafovutlar faqat jamiyatning eng kam ta'minlangan qatlamlari manfaatiga xizmat qilgan taqdirdagina oqlanishi mumkinligi asoslanadi.[38] O‘zbekiston sharoitida bu yondashuv aholini qo‘llab-quvvatlash dasturlari, kambag‘allikni qisqartirish, bandlik, ta'lim, tibbiyot, nogironligi bo‘lgan shaxslar uchun sharoit yaratish va hududiy tengsizliklarni kamaytirish vazifalariga bevosita tatbiq etiladi. Binobarin, ijtimoiy davlatning adolat mezoni faqat kimga qancha yordam berilgani bilan emas, balki yordam jamiyatdagi imkoniyatlar tafovutini qanchalik kamaytirgani bilan baholanadi.

Birdamlik prinsipi esa ijtimoiy davlatni individualistik bozor munosabatlari bilan muvozanatlashtiradi. Bozor iqtisodiyoti shaxsiy tashabbus, tadbirkorlik va raqobatni rag‘batlantiradi, biroq ijtimoiy risklarni ham yuzaga keltiradi: ishsizlik, kasallik, nogironlik, qarilik, boquvchisini yo‘qotish, ta'lim va tibbiy xizmatlarga teng yetib bormaslik kabi holatlar shular jumlasidandir. Ijtimoiy davlat aynan mana shu risklarni jamiyatning umumiy mas'uliyati sifatida tan oladi. Esping-Andersen ijtimoiy davlatlarni tahlil qilganida, fuqarolarning bozor daromadlariga mutlaq qaramligini kamaytirish, ijtimoiy huquqlarni institutsionallashtirish va risklarni jamoaviy taqsimlash ijtimoiy siyosatning asosiy belgilaridan ekanini ko‘rsatadi.[39]

[38] Rawls J. A Theory of Justice. Cambridge, MA: Harvard University Press, 1971. – P. 60–65, 266–267.

[39] Esping-Andersen G. The Three Worlds of Welfare Capitalism. Princeton: Princeton University Press, 1990. – P. 18–34.

Konstitutsiyaviy matnda mehnat huquqi ham ijtimoiy davlatning asosiy tayanchlaridan biridir. 42-modda har kimning munosib mehnat qilish, kasb va faoliyat turini erkin tanlash, xavfsiz va gigiyena talablariga javob beradigan qulay mehnat sharoitlarida ishlash, adolatli haq olish hamda ishsizlikdan himoyalanish huquqini belgilaydi.[40] Bu norma ijtimoiy davlatni faqat nafaqa va yordam tizimi bilan cheklab qo‘ymaydi. Aksincha, u ijtimoiy himoyaning birinchi bosqichi sifatida munosib mehnat va barqaror daromadni qo‘yadi. Chunki fuqaro farovonligining eng barqaror manbai — passiv yordam emas, munosib ish, kasbiy malaka va xavfsiz mehnat sharoitidir.

Munosib mehnat prinsipining siyosiy ahamiyati shundaki, u fuqaroni davlatdan doimiy yordam oluvchi passiv subyekt sifatida emas, iqtisodiy va ijtimoiy hayotda faol ishtirok etuvchi shaxs sifatida ko‘radi. Xalqaro mehnat tashkiloti “munosib mehnat” konsepsiyasida bandlik, huquqlar, ijtimoiy himoya va ijtimoiy dialog o‘zaro bog‘liq ekanini ta’kidlaydi.[41] O‘zbekiston Konstitutsiyasida mehnat huquqining ijtimoiy davlat kontekstida mustahkamlanishi bandlik siyosatini ijtimoiy siyosatning markaziy elementi sifatida ko‘rish imkonini beradi. Shu sababli kambag‘allikni qisqartirish siyosati nafaqat moddiy yordam, balki ish o‘rinlari, kasbga o‘qitish, tadbirkorlikka ko‘mak va mehnat bozoriga qayta kirish mexanizmlari bilan bog‘lanishi zarur.

[40] O‘zbekiston Respublikasi Konstitutsiyasi. 42-modda. https://lex.uz/docs/6445145 (murojaat qilingan sana: 2025.05.24).

[41] International Labour Organization. Decent Work. Geneva: ILO, 1999; ILO. Social Protection Floors Recommendation, 2012 (No. 202). Geneva: ILO, 2012. – Paras. 3–5.

IJTIMOIY DAVLATNING STRATEGIK MEZONLARI

Mamatqobilov Tursunmurat Daniyorovich

O‘zbekiston jahon tillari universiteti

Siyosiy fanlar kafedrasi dotsenti, s.f.n.

Annotatsiya: *Mazkur maqolada Ijtimoiy davlat mohiyati, strategiyasi, Skandinaviya mamlakatlari, Xitoy va Turkiya davlatlari ijtimoiy siyosatining qiyosiy tahlili haqida fikrlar bayon etilgan.*

Kalit iboralar: *Ijtimoiy siyosat, ijtimoiy davlat, strategiya, Skandinaviya, Xitoy va Turkiya davlatlarinig ijtimoiy himoya siyosati, qiyosiy tahlil.*

Аннотация: *В данной статье представлены идеи о сущности государства всеобщего благосостояния, стратегия, а также проведен сравнительный анализ социальной политики скандинавских стран, Китая и Турции.*

Ключевые слова: *Социальная политика, государство всеобщего благосостояния, политика социальной защиты скандинавских, китайских и турецких стран, сравнительный анализ.*

Abstract: *This article discusses the essence of the social state and presents a comparative analysis of the social policies of Scandinavian countries, China, and Turkey.*

Keywords: *Social policy, social state, social protection, systemic institutionalization, comparative analysis.*

KIRISH

Ijtimoiy davlatning strategik mezonlarini besh guruhga ajratish mumkin. Birinchi guruh - huquqiy kafolatlar mezoni: fuqaroning ijtimoiy ta’minot, munosib mehnat, sog‘liq, ta’lim va yordam olish huquqi qonun bilan kafolatlanadimi, rad etilgan taqdirda e’tiroz bildirish yo‘li bormi. Ikkinchi guruh - qamrov mezoni: ehtiyojmand shaxslar tizimga kiryaptimi, xizmatdan chetda qolgan guruhlar bor-yo‘qmi, hududlar kesimida qamrov tafovuti qanday. Uchinchi guruh - sifat mezoni: xizmat vaqtida, tushunarli, inson qadriga mos va professional ko‘rsatiladimi. To‘rtinchi guruh - natija mezoni: yordam yoki

xizmat oilaning daromadiga, bandlikka, bolalar ta’limiga, salomatlikka va mustaqil hayotga qanday ta’sir qildi. Beshinchi guruh - barqarorlik mezoni: model budjet, kadrlar, raqamli infratuzilma va institutlar jihatidan uzoq muddat ishlay oladimi.

Bunday mezonlar tizimi ijtimoiy siyosatni ma’muriy hisobotdan ilmiy asoslangan strategik boshqaruvga olib chiqadi. Masalan, kambag‘allikdan chiqarish bo‘yicha xulosa faqat oilaga moddiy yordam berilgani bilan emas, oilaning 6 oy yoki 12 oydan keyingi daromadi, bandligi, bolalarining ta’limda qolishi, sog‘liq xizmatlaridan foydalanishi va qayta yordamga tushish ehtimoli bilan baholansa, siyosat real natijani ko‘rsatadi. Xuddi shuningdek, nogironligi bo‘lgan shaxsga texnik vosita berish natijasi faqat vosita soni bilan emas, uning harakatlanish, o‘qish, ishlash, xizmatlardan foydalanish va ijtimoiy hayotda qatnashish imkoniyati bilan o‘lchanishi kerak.

Yangi O‘zbekiston siyosiy diskursida “inson qadri” tushunchasi ijtimoiy siyosatning boshqaruv mezoni sifatida talqin qilinadi. Bu mezon fuqaroning yordam so‘rash jarayonida kamsitilmasligi, ortiqcha idoraviy to‘siqlarga duch kelmasligi, shaxsiy hayoti hurmat qilinishi, xizmatlar esa uning mustaqilligini oshirishga yo‘naltirilishi hamda davlat qarori tushunarli, asosli va apellyatsiya qilinadigan bo‘lishini talab etadi.

Konstitutsiyadagi ijtimoiy davlat prinsipi inson qadrini huquqiy mezonga aylantiradi.[42] Bu prinsipga ko‘ra, davlat ijtimoiy siyosatni xayriya yoki homiylik sifatida emas, fuqarolar oldidagi konstitutsiyaviy majburiyat sifatida amalga oshiradi. Binobarin, 2030-yilgacha ijtimoiy davlat modelida “inson qadri” har bir xizmat reglamenti, har bir ariza jarayoni, har bir raqamli platforma, har bir mahalla xulosasi va har bir budjet dasturida aks etishi kerak. Fuqaro uchun

[42] O‘zbekiston Respublikasi Konstitutsiyasi, 1- va 14-moddalar. https://lex.uz/docs/6445145 (murojaat qilingan sana: 2025.05.24).

xizmat olish jarayoni qanchalik sodda, tez, tushunarli va hurmatli bo‘lsa, ijtimoiy davlatning real sifati shunchalik yuqori bo‘ladi.

“Inson qadri”ni operatsionlashtirish uchun birinchi amaliy indikator - xizmatga kirish qulayligi. Masalan, ijtimoiy xizmatga murojaat qilish uchun fuqaro necha marta idoraga boradi, nechta hujjat topshiradi, qancha kutadi, javobni qaysi tilda va qaysi shaklda oladi, rad etish sababi tushuntiriladimi. Ikkinchi indikator - xizmat davomida qadr-qimmatning saqlanishi: fuqaro haqidagi ma’lumotlar sir saqlanadimi, unga qo‘pol muomala qilinmaydimi, xizmat ko‘rsatuvchi xodim professional etikaga amal qiladimi. Uchinchi indikator - xizmat natijasi: yordam fuqaroning mustaqil yashash, ishlash, o‘qish, sog‘ayish yoki jamiyatga qayta qo‘shilish imkoniyatini oshirdimi.

Bu yondashuv ijtimoiy siyosatda oddiy “ko‘rsatkich bajarildi” madaniyatidan “fuqaro hayotida o‘zgarish bo‘ldi” madaniyatiga o‘tishni anglatadi. Misol uchun, nogironligi bo‘lgan shaxsga reabilitatsiya texnik vositasi ajratish statistik ko‘rsatkichni bajarishi mumkin. Ammo vosita sifatli bo‘lmasa, foydalanishga moslashtirilmasa, shaxs uyidan chiqish imkoniga ega bo‘lmasa yoki jamoat transporti to‘siqsiz bo‘lmasa, inson qadri nuqtai nazaridan natija yetarli bo‘lmaydi. Ana shu sababli 2030-yilgacha ijtimoiy davlat modelida har bir ko‘rsatkich “inson qadri” mezoni bilan qayta o‘qilishi kerak.

Ushbu paragraf tahlillari asosida 2030-yilgacha Yangi O‘zbekiston ijtimoiy davlat modelini takomillashtirish bo‘yicha birinchi tavsiya - ijtimoiy siyosatning yagona konseptual pasportini ishlab chiqishdir. Unda ijtimoiy davlat, ijtimoiy himoya, ijtimoiy xizmat, ijtimoiy yordam, ijtimoiy sug‘urta, kambag‘allikdan chiqarish, case-management, ijtimoiy karta, professional ijtimoiy xodim va natijadorlik tushunchalari bir xil huquqiy-metodik ma’noda ishlatilishi kerak. Terminologik noaniqlik siyosiy va ma’muriy noaniqlikni keltirib chiqaradi.

Ikkinchi tavsiya - “Ijtimoiy davlat indikatori” tizimini joriy etish. Bu tizim ko‘rsatkichlarini takrorlamasdan, ularni siyosiy-institutsional tahlilga mos ravishda umumlashtiradi. Masalan, huquqiy kafolat, qamrov, sifat, tezlik, natija, shikoyat, hududiy tenglik, raqamli qulaylik, fuqarolar qoniqishi va jamoatchilik nazorati bloklari shakllantiriladi. Har bir hudud yil yakunida ushbu indikatorlar bo‘yicha baholanadi.

Uchinchi tavsiya - “kambag‘allikdan chiqish xizmatlari”ni faqat ro‘yxatdan chiqarish amaliyoti emas, oilaning barqaror farovonlikka chiqishi sifatida belgilash. Bunda daromad, bandlik, bolalar ta’limi, sog‘liq, qarzdorlik, uy-joy, ijtimoiy xizmatlardan foydalanish va qayta kambag‘allikka tushish xavfi baholanadi. Bu yondashuv kambag‘allik siyosatini statistik pasayish emas, real ijtimoiy mobilitetga aylantiradi.

To‘rtinchi tavsiya - ijtimoiy xodimlar kasbiy standartini kuchaytirish. Professional xizmatlar tizimida kadrlar malakasi hal qiluvchi omildir. Ijtimoiy xodim huquqiy bilim, psixologik muloqot, case-management, ma’lumotlar bilan ishlash, etik me’yorlar, bolalar va nogironlik siyosati, gender sezgirlik va mahalla bilan ishlash ko‘nikmalariga ega bo‘lishi kerak.

Beshinchi tavsiya - raqamli ijtimoiy monitoringni ochiq jamoatchilik hisobotlari bilan bog‘lash. Raqamli platforma ichki boshqaruvni kuchaytiradi, lekin ochiq hisobot ijtimoiy ishonchni oshiradi. Shu sababdan har yili “Yangi O‘zbekistonda ijtimoiy davlat: natijalar va muammolar” nomli ochiq hisobot tayyorlanishi maqsadga muvofiq.

Oltinchi tavsiya - har bir yirik ijtimoiy dastur uchun mustaqil ta’sir baholash tizimini joriy etish. Dastur boshlanishidan oldin bazaviy ko‘rsatkich, amalga oshirish jarayonida oraliq monitoring, yakunda esa ta’sir baholash bo‘lishi kerak. Bu davlat resurslarining samarali ishlatilishini, siyosiy qarorlarning ilmiy asoslanishini va takroriy xatolarning oldini oladi.

Yettinchi tavsiya - ijtimoiy davlat modelini fuqarolar bilan muloqot asosida rivojlantirish. Fuqaro yordam oluvchi sifatida emas, xizmat sifati bo‘yicha tajriba egasi sifatida tinglanishi kerak. “Inson” markazlari, mahallalar, NNTlar va raqamli platformalarda xizmat oluvchilarning fikrini yig‘ish hamda siyosiy qarorga kiritish mexanizmi bo‘lishi zarur.

Sakkizinchi tavsiya - ijtimoiy siyosatni ekologik va demografik risklar bilan bog‘lash. Iqlim o‘zgarishi, suv tanqisligi, migratsiya, urbanizatsiya va demografik o‘sish kelajakdagi ijtimoiy risklarga ta’sir qiladi. Shu sababli 2030 yilgacha ijtimoiy davlat modelida iqlimga sezgir hududlar, qishloq aholisi, ichki migrantlar va shahar atrofidagi kambag‘allik xavflari alohida o‘rganilishi kerak.

To‘qqizinchi tavsiya - xususiy sektorni ijtimoiy davlatning raqibi emas, hamkori sifatida ko‘rish. Kasbga o‘qitish, bandlik, reabilitatsiya vositalari, ijtimoiy xizmatlar, parvarish, uy-joy va raqamli yechimlarda xususiy sektor ishtiroki davlat nazorati va sifat standartlari asosida kengaytirilishi mumkin. Biroq zaif guruhlarning huquqlari bozor mexanizmlari hisobiga cheklanmasligi kerak.

O‘ninchi tavsiya – 2030-yil yakunida yangi bosqich uchun ijtimoiy davlat strategiyasini ishlab chiqish. Bu strategiya natijalari, xalqaro baholashlar, milliy so‘rovlar, ijtimoiy xizmatlar auditi va ilmiy tadqiqotlar asosida tayyorlanishi kerak. Shunda O‘zbekiston ijtimoiy davlat modelini kampaniya emas, uzluksiz institutsional rivojlanish sifatida davom ettiradi.

2030-yilgacha mamlakatda ijtimoiy davlat modelining muvaffaqiyati xususiy sektor o‘sishi, rasmiy bandlik, soliq bazasining kengayishi, mehnat unumdorligi va inson kapitaliga bog‘liq. Agar bandlik sifati oshsa, davlat budjetiga tushumlar ko‘payadi, ijtimoiy sug‘urta tizimi barqarorlashadi, aholi daromadi o‘sadi va yordamga qaramlik kamayadi. Aksincha, norasmiy bandlik, past ish haqi va past unumdorlik saqlansa, ijtimoiy davlatning moliyaviy asosi zaiflashadi.

Bu yerda davlatning roli faqat mablag‘ ajratish emas, ijtimoiy investitsiyani to‘g‘ri yo‘naltirishdir. Ta’lim, sog‘liq, bolalar parvarishi, reabilitatsiya va bandlikka ajratilgan xarajatlar uzoq muddatda mehnat unumdorligini, daromadni va soliq bazasini oshiradi. Shuning uchun ijtimoiy davlatni moliyaviy yuk emas, inson kapitaliga strategik investitsiya sifatida ko‘rish zarur.

Mualliflik taklifi shundan iboratki, 2030-yilgacha har bir yirik ijtimoiy dastur uchun iqtisodiy qaytish va ijtimoiy ta’sir birgalikda baholanishi kerak. Masalan, kasbga o‘qitish dasturi bo‘yicha bitiruvchilar ishga joylashish darajasi, daromad o‘sishi, qayta yordamga tushish ehtimoli va soliq to‘lovchi maqomiga o‘tish ko‘rsatkichlari birgalikda o‘lchanishi lozim.

Ijtimoiy siyosatning an’anaviy modeli ko‘pincha muammo yuzaga kelgandan keyin unga javob beradi. Fuqaro kambag‘allikka tushadi, ishsiz qoladi, sog‘lig‘i yomonlashadi yoki oilaviy inqirozga duch keladi, shundan keyingina davlat tizimi aralashadi. 2030-yilgacha ijtimoiy davlatning yangi bosqichi esa profilaktik, ya’ni oldini olishga qaratilgan yondashuvni talab qiladi.

O‘zbekiston uchun profilaktik model mahalla, tibbiyot, ta’lim, bandlik va ijtimoiy xizmatlar ma’lumotlarini ehtiyotkorlik bilan integratsiya qilishni talab qiladi. Bu integratsiya shaxsiy ma’lumotlarni himoya qilish qoidalariga qat’iy rioya etgan holda amalga oshirilishi kerak. Maqsad fuqaroni nazorat qilish emas, ehtiyojni erta aniqlash va xizmatni o‘z vaqtida yetkazishdir.

2030-yilgacha profilaktik ijtimoiy siyosat uchun uchta indikator taklif etiladi: muammo aniqlangandan xizmat boshlanguncha o‘tgan vaqt; og‘ir holatga tushishdan oldin xizmatga yo‘naltirilgan shaxslar ulushi; profilaktik aralashuv natijasida qayta murojaat yoki chuqur inqirozga tushish holatlarining kamayishi. 2030-yilgacha O‘zbekiston uchun asosiy metodologik xulosa shuki, xorijiy modelni to‘liq ko‘chirish mumkin emas. Har bir model o‘zining tarixiy,

iqtisodiy, soliq, madaniy, demografik va siyosiy sharoitida shakllangan. O‘zbekiston esa selektiv-integratsion yondashuvdan foydalanishi kerak.

Masalan, Skandinaviya tajribasidan universal kafolatlar, yuqori ishonch, xizmat sifati, gender tenglik va mahalliy xizmatlar modelini o‘rganish mumkin. Biroq yuqori soliq yuki va keng universalizm O‘zbekistonning hozirgi fiskal hamda institutsional sharoitida to‘liq ko‘chirilmaydi. Xitoy tajribasidan hududiy maqsadli mobilizatsiya, kambag‘allikni aniq o‘lchash va infratuzilma bilan bog‘lash tajribasi olinadi, lekin u demokratik jamoatchilik nazorati va huquqiy kafolatlar bilan moslashtirilishi kerak. Turkiya tajribasidan oilaga yaqin yordam, shartli transferlar va mahalliy ijtimoiy yordam fondlari o‘rganiladi, lekin O‘zbekiston mahalla va “Inson” markazlari bilan o‘z modelini quradi.

Moslashtirish mezonlari beshta bo‘lishi kerak: konstitutsiyaviy moslik, fiskal imkoniyat, institutsional salohiyat, hududiy-madaniy muvofiqlik va natijadorlik. Agar xorijiy tajriba ushbu mezonlardan o‘tmasa, uni ko‘chirish emas, faqat ayrim elementlarini sinovdan o‘tkazish maqsadga muvofiq.

O‘zbekistonning afzalligi shundaki, u mahalla, konstitutsiyaviy ijtimoiy davlat prinsipi, raqamli hukumat, professional ijtimoiy xizmatlar va fuqarolik jamiyati institutlarini birlashtira oladi. Bu kombinatsiya to‘g‘ri boshqarilsa, milliy modelning o‘ziga xosligi va samaradorligini ta’minlaydi.

Ushbu paragraf yakunida ijtimoiy davlat modelining strategik natijasini ilmiy formula ko‘rinishida ifodalash mumkin: ijtimoiy davlat = huquqiy kafolat + manzilli va inklyuziv qamrov + professional xizmat + inson kapitali + bandlik + raqamli monitoring + jamoatchilik nazorati + fiskal barqarorlik. Ushbu elementlardan biri zaif bo‘lsa, modelning umumiy samaradorligi pasayadi.

Huquqiy kafolat bo‘lmasa, yordam xayriya xarakterida qoladi. Manzillilik bo‘lmasa, resurslar samarasiz sarflanadi. Inklyuzivlik bo‘lmasa, ayrim guruhlar chetda qoladi. Professional xizmat bo‘lmasa, pul yordami murakkab ijtimoiy muammolarni hal qilmaydi. Inson kapitali bo‘lmasa, kambag‘allik avlodlararo

davom etadi. Bandlik bo‘lmasa, yordamga qaramlik kuchayadi. Raqamli monitoring bo‘lmasa, natija ko‘rinmaydi. Jamoatchilik nazorati bo‘lmasa, ishonch pasayadi. Fiskal barqarorlik bo‘lmasa, model uzoq ishlamaydi.

Shu formula asosida 2030-yilgacha O‘zbekiston ijtimoiy davlatining strategik natijasi quyidagicha bo‘lishi kerak: kambag‘allik sezilarli qisqaradi, ishsizlik kamayadi, ijtimoiy xizmatlar tezlashadi, nogironligi bo‘lgan shaxslar uchun mustaqil hayot imkoniyatlari kengayadi, bolalar va xotin-qizlar himoyasi kuchayadi, raqamli karta va platformalar xizmatni yengillashtiradi, fuqarolik jamiyati nazorati kuchayadi va davlatga ishonch ortadi.

Binobarin, 2030-yilgacha O‘zbekistonning ijtimoiy davlat modelini takomillashtirish vazifasi ijtimoiy siyosatni alohida yordamlar yig‘indisidan chiqarib, davlat boshqaruvining markaziy strategik yo‘nalishiga aylantirishdan iborat. Ushbu model muvaffaqiyatli amalga oshsa, O‘zbekiston ijtimoiy siyosati milliy sharoitga mos, xalqaro mezonlarga yaqin, ilmiy asoslangan va fuqarolar hayotiga real ta’sir ko‘rsatuvchi tizimga aylanadi.

APPLIED POLITICAL SCIENCE: STRUCTURE, SOCIAL FUNCTIONS, RESEARCH DIRECTIONS, POLITICAL FORECASTING AND CONTEMPORARY CHALLENGES

Master of International Studies Suyunova Zarnigor Shovkidin kizi

Uzbekistan State World Languages University Political Science Department

Scintific researcher Syunova Elmira Shovkidin kizi

Gulistan State University

Abstract: *Applied political science is an important area of contemporary political knowledge that connects theoretical concepts and empirical research with practical political processes and decision-making. Unlike purely theoretical political science, which primarily seeks to explain the general principles and regularities of political life, applied political science focuses on concrete political situations, events, institutions, actors, public policies, conflicts, and possible future developments. Its practical orientation makes it particularly important for governments, political institutions, civil society organizations, international organizations, research centers, media organizations, and other actors involved in political decision-making. This article examines the structure and social functions of applied political science, its major areas of interest, the role of political situations and events as objects of applied research, and the main directions and content of political studies. Particular attention is given to the activities of international analytical and scientific centers, the subjects of applied political science, and the relationship between theoretical political science and applied research. The article also considers political forecasting as one of the central functions of applied political science and discusses contemporary challenges, including methodological pluralism, data quality, digital transformation, disinformation, uncertainty, ethical issues, and the growing complexity of political environments. The study argues that the effectiveness of applied political science depends on the combination of theoretical rigor, empirical evidence, methodological diversity, analytical independence, and responsible communication of research results.*

Keywords: *applied political science, political analysis, political research, political situation, political events, policy analysis, political forecasting, think tanks, political actors, political decision-making.*

1. INTRODUCTION

Political science has developed into a multidisciplinary field that examines political institutions, processes, behavior, power relations, public policy, international relations, and mechanisms of political decision-making. Within this broad discipline, applied political science occupies a specific position because it seeks to transform theoretical knowledge and empirical evidence into practically useful analytical conclusions. Its central purpose is not merely to describe political reality but to identify the causes, mechanisms, consequences, and possible trajectories of political processes.

The distinction between theoretical and applied political science should not be interpreted as an absolute separation. Theoretical political science develops concepts, explanatory models, hypotheses, and general propositions, whereas applied political science tests, operationalizes, and uses such knowledge in relation to concrete political problems. Modern research methodology emphasizes that the research process should connect the formulation of a question with research design, conceptualization, measurement, data collection, and qualitative or quantitative analysis.

Applied political science is particularly relevant in situations characterized by political uncertainty. Governments and other political actors frequently need to make decisions before all relevant information becomes available. Consequently, political analysis must assess available evidence, identify alternative scenarios, estimate possible consequences, and communicate uncertainty. Policy analysis, for example, generally involves defining a problem, identifying its causes, constructing alternatives, establishing evaluation criteria, and assessing possible consequences.

The objective of this article is to examine the conceptual structure, social functions, research interests, institutional subjects, major research directions, forecasting functions, and contemporary challenges of applied political science.

2. Structure and Social Functions of Applied Political Science

The structure of applied political science can be understood as a system consisting of several interconnected elements. The first element is the **object of research**. It includes political institutions, political processes, social groups, political behavior, public policies, elections, conflicts, international relations, political communication, and concrete political situations.

The second element is the **subject of analysis**, namely the particular political relationship, mechanism, process, or problem selected for investigation. For example, an applied study may examine voter behavior, the effectiveness of a public policy, the causes of political instability, the dynamics of an international conflict, or the consequences of institutional reform.

The third element is the **methodological component**. Applied political research may employ statistical analysis, surveys, interviews, case studies, comparative analysis, content analysis, discourse analysis, process tracing, experiments, network analysis, scenario development, and forecasting models. Contemporary political methodology increasingly recognizes the importance of methodological pluralism: the appropriate method depends on the research question and the theoretical assumptions underlying the study.

The fourth element is the **analytical component**, through which collected information is transformed into explanations, assessments, scenarios, and conclusions. Finally, there is a **practical component**, which involves

communicating research findings to policymakers, public institutions, civil society organizations, media, and other stakeholders.

The social functions of applied political science are diverse. First, it performs an **informational function** by providing systematic knowledge about political developments. Second, it performs a **diagnostic function**, identifying the causes and mechanisms underlying political problems. Third, it performs an **evaluative function**, assessing the effects of policies and political decisions. Fourth, it has a **forecasting function**, helping actors consider possible future developments. Fifth, it performs a **consultative function**, providing evidence and analytical alternatives for decision-makers.

Applied political science therefore contributes to reducing informational uncertainty. However, its task is not to eliminate uncertainty completely. Political processes involve human choices, competing interests, institutional constraints, and unexpected events. Consequently, high-quality applied research should communicate both conclusions and the degree of uncertainty associated with them.

3. Areas of Interest in Applied Political Science

The field of applied political science encompasses a wide range of practical political questions. One of its major areas is **public policy analysis**. Policy analysts investigate social problems, identify their causes, evaluate policy alternatives, and examine the likely consequences of different decisions. Policy analysis can be scientific, professional, or politically oriented, and these approaches differ in their purposes, standards, and relationships to political values.

A second important area is **electoral and public opinion research**. Applied political scientists analyze electoral behavior, political participation, public attitudes, campaign communication, political trust, and the relationship between social characteristics and political preferences. Such research can

provide empirical information about political participation without itself determining what citizens should choose.

A third area is **institutional analysis**. Researchers examine the functioning of legislatures, executives, courts, political parties, electoral institutions, local governments, and administrative organizations. Institutional analysis can reveal how formal rules and informal practices affect political outcomes.

A fourth area concerns **political conflict and political stability**. Applied researchers investigate the causes and dynamics of political conflicts, protest movements, civil unrest, interstate disputes, and other forms of political confrontation. Quantitative forecasting models can combine event data with statistical techniques to examine conflict dynamics and generate estimates under conditions of uncertainty.

A fifth area is **international political analysis**. This includes research on international security, diplomacy, geopolitical developments, regional integration, international organizations, global governance, economic security, and transnational challenges.

Finally, applied political science increasingly studies the political consequences of **digital technologies**. Social media, artificial intelligence, big data, algorithmic communication, cyber-security, digital campaigning, and online disinformation have created new objects of political analysis.

4. Political Situation and Political Event as Key Objects of Applied Political Science

A political situation represents a combination of political, social, institutional, economic, and international conditions existing at a particular moment. A political event, by contrast, is a concrete occurrence that changes or potentially changes the political situation. Elections, government changes,

parliamentary decisions, protests, political agreements, international crises, and institutional reforms can all constitute political events.

The political situation is particularly important for applied political science because practical decision-making always takes place within a specific context. The same policy instrument may produce different results under different institutional, social, or economic conditions.

Applied political analysis therefore normally begins with situational diagnosis. The researcher identifies the main actors, their interests, resources, institutional positions, relationships, constraints, and possible strategies. The analysis then examines the available evidence and constructs alternative explanations or scenarios.

The distinction between event and process is also important. A single political event may be highly visible, but its significance cannot always be understood without examining the longer process in which it occurs. For example, a governmental decision may be the result of institutional bargaining, previous policy failures, public pressure, economic constraints, or international developments.

Consequently, applied political science seeks to move from the description of an event toward an explanation of its causes and possible consequences. This makes political analysis more than a simple collection of political facts.

5. Main Directions and Content of Applied Political Research

Applied political research can be divided into several major directions.

First, descriptive research identifies and systematically presents political facts and trends. It answers questions such as: What is happening? Who are the relevant actors? What has changed?

Second, explanatory research investigates why a particular political development has occurred. It focuses on causal mechanisms, institutional structures, social conditions, and actor strategies.

Third, evaluative research examines whether a political programme, reform, or public policy has achieved its intended objectives. Evaluation may involve quantitative indicators, qualitative evidence, comparative analysis, or mixed methods.

Fourth, comparative research compares political systems, institutions, policies, or cases in order to identify similarities, differences, and possible explanations.

Fifth, scenario analysis develops alternative possible futures based on different assumptions. Scenario analysis is particularly useful when political developments are characterized by high uncertainty.

Sixth, forecasting research seeks to estimate the probability or expected direction of future political developments. Forecasting has become increasingly significant in political science because forecasts are useful both for political actors and for testing theoretical models.

The methodological foundation of these research directions includes both quantitative and qualitative methods. Contemporary methodological literature emphasizes the importance of research design, conceptualization, measurement, large-scale data collection, quantitative analysis, qualitative methods, and mixed-method approaches.

6. International Analytical and Scientific Centers

International analytical centers, commonly known as **think tanks**, are important institutional actors in applied political research. They occupy an intermediate space between academic research, public policy, government institutions, civil society, and public debate.

One prominent example is the **Brookings Institution**, whose Foreign Policy program conducts policy-relevant research on international peace and security. Its research is organized through regional and thematic centers and is communicated through books, policy papers, academic publications, seminars, public events, and other form.

Another important institution is **Chatham House**, the Royal Institute of International Affairs. It describes its mission in terms of independent analysis of major global challenges and organizes research through geographic and thematic programmes. Its publications undergo editorial and peer-review processes, while its research covers areas including global governance, security, international economics, regional politics, technology, and international law.

The **Center for Strategic and International Studies (CSIS)** is another major policy research organization. Its research covers defense and security, geopolitics and foreign policy, economic security and technology, and global development. CSIS emphasizes original data, open-source analysis, data visualization, and communication of research to policymakers and broader audiences.

The activities of such organizations demonstrate several important characteristics of applied political science: interdisciplinary research, policy relevance, rapid analysis of emerging problems, interaction with policymakers, public communication, and the use of empirical evidence.

At the same time, analytical centers should be evaluated carefully with regard to their funding structures, institutional missions, methodological standards, and potential biases. The existence of a professional research organization does not automatically guarantee neutrality or correctness. Responsible users of political research should therefore examine methodology, evidence, authorship, funding, and the distinction between empirical findings and policy recommendations.

7. CONCLUSION

Applied political science represents an essential connection between political theory, empirical research, and practical decision-making. Its structure includes research objects, analytical subjects, theoretical concepts, methodological tools, empirical data, analytical procedures, and mechanisms for communicating results.

Its social functions extend beyond the provision of information. Applied political science diagnoses political problems, evaluates policies, explains political behavior, identifies institutional mechanisms, develops scenarios, and produces forecasts. Its practical value is particularly visible when political actors face uncertainty and must consider alternative courses of action.

Political situations and political events are central objects of applied research because they provide concrete contexts in which political mechanisms become observable. However, an effective analysis should not limit itself to describing events; it should investigate their causes, institutional context, actor strategies, consequences, and possible future trajectories.

International analytical centers and think tanks demonstrate the institutional importance of applied political research. Organizations such as Brookings, Chatham House, and CSIS combine empirical research, expert knowledge, policy analysis, public communication, and engagement with decision-makers. Their activities also demonstrate the importance of methodological transparency and institutional independence.

Political forecasting is another central dimension of applied political science. It provides structured estimates of possible future developments and can simultaneously serve practical decision-making and theoretical testing. Nevertheless, forecasts should be interpreted as conditional analytical estimates rather than deterministic predictions.

The future development of applied political science will depend on its ability to combine theoretical rigor, methodological pluralism, high-quality empirical evidence, digital research capabilities, ethical standards, and transparent communication. In an increasingly complex political environment, the principal value of applied political science lies not in claiming certainty, but in providing disciplined, evidence-based ways of understanding political reality, assessing alternatives, and preparing for possible futures.

REFERENCES

Bechtel, M. M., & Leuffen, D. (2010). Forecasting European Union politics: Real-time forecasts in political time series analysis. *European Union Politics, 11*(2), 213–236. https://doi.org/10.1177/1465116509360846.

Brandt, P. T., Freeman, J. R., & Schrodt, P. A. (2011). Real time, time series forecasting of inter- and intra-state political conflict. *Conflict Management and Peace Science, 28*(1), 41–64. https://doi.org/10.1177/0738894210388125.

Bulutgil, H. Z., & Mylonas, H. (2026). Theory before method: The case for methodological pluralism in political science. *International Political Science Review*. https://doi.org/10.1177/01925121261445570.

Curini, L., & Franzese, R. (Eds.). (2020). *The SAGE handbook of research methods in political science and international relations*. SAGE Publications.

Kraft, M. E., & Furlong, S. R. (2022). *Public policy: Politics, analysis, and alternatives* (5th ed.). SAGE Publications.

Lamont, C., & Boduszynski, M. P. (2025). *Research methods in politics and international relations* (2nd ed.). SAGE Publications.

Vaughan, R. J., & Buss, T. F. (1998). *Communicating social science research to policy makers*. SAGE Publications.

American Political Science Association. (2026). *Political Forecasting Group and related groups*. American Political Science Association.

Brookings Institution. (2026). *Foreign Policy: Centers, projects, and initiatives*. Brookings Institution.

Center for Strategic and International Studies. (2026). *About CSIS*. Center for Strategic and International Studies.

Chatham House. (2026). *Our departments and programmes*. Royal Institute of International Affairs.

Chatham House. (2026). *Research publications*. Royal Institute of International Affairs.

OTTO KERNBERG VA HAYNS KOHUTLARGA KO‘RA SHAXS STRUKTURASI

Is’hoq Arabov,

O‘zbekiston xalqaro islomshunoslik akademiyasi tadqiqotchisi,

Iskhoq.arabov@gmail.com,

ORCID iD: 0009-0003-8766-786X

“Nigohingizni ichki olamingizga qarating, o‘z ruhiy olamingizning tub-tubiga nazar tashlang va eng avvalo, o‘zingizni anglashni o‘rganing”.

Z.Freyd

Annotatsiya. *Ushbu maqolada zamonaviy psixoanalitikaning ikki yirik vakili shaxs va uning strukturasini qanday konseptuallashtirishi, uning tarkibiy qismlari, ichki dinamikasi hamda rivojlanish jarayonini aynan qay shaklda tushuntirib berishi ko‘rib chiqiladi. Qolaversa, maqolada ikki yondashuvning umumiy va farqli tomonlari asosida shaxs strukturasini kompleks anglash imkoniyatlari ko‘rsatib beriladi.*

Kalit so‘zlar. *Psixoanalitika, shaxs strukturasi, self, self-obyekt munosabatlari.*

Annotation. *This article examines how two prominent representatives of contemporary psychoanalysis conceptualize the personality and its structure, including how they understand its constituent components, internal dynamics, and developmental processes. Furthermore, the article highlights the possibilities for a comprehensive understanding of personality structure based on the similarities and differences between the two approaches.*

Keywords. *Psychoanalysis, personality structure, self, self-object relations.*

KIRISH

Shaxs strukturasini ilmiy tahlil qilish psixologiya fanining eng muhim nazariy masalalaridan sanalib, insonning ichki olami va xulq-atvor mexanizmlarini anglashda alohida ahamiyat kasb etadi. Hozirgi zamon psixologiya fani (ayniqsa, ushbu fan doirasidagi har bir olim) ushbu masalaga turli metodologik va konseptual yondashuvlar asosida izoh berib kelmoqda. Shu

bois, mazkur maqolada O.Kernberg va H.Kohutlarning shaxs strukturasi yuzasidan ilgari surgan ilmiy qarashlari qiyosiy-nazariy asosda tahlil qilinadi.

ASOSIY QISM

Bunda, biz har ikki psixonalitikning shaxs strukturasini qanday konseptuallashtirishi, uning tarkibiy qismlari, ichki dinamikasi hamda rivojlanish jarayonini qay shaklda izohlashi nuqtai nazaridan ko‘rib chiqamiz:

Otto Kernbergning fikriga ko‘ra, shaxsning psixologik tuzilishi “Obyekt munosabatlari nazariyasi”ga *(Object relations theory)* asoslanadi. Freydning Id, Ego va Superegodan iborat modeli asosan, psixikadagi biologik mayllarga urg‘u bersa, Kernberg modeli psixikaning tuzilishi boshqa insonlar bilan munosabatlar jarayonida orttirilgan va keyinchalik shaxsning ichki psixik tajribasiga aylangan munosabat tajribalari asosida shakllanadi, degan qarashga tayanadi. Quyida uning shaxs tuzilmasi modelining aniq va ilmiy jihatdan tizimlashtirilgan tavsifi keltiriladi:

1. Fundamental birlik: obyekt munosabatlari triadasi. Kernbergning fikricha, psixikaning asosiy tarkibiy birliklarini instinktlar emas, balki munosabat birliklari tashkil etadi. Har bir bunday birlik bir-biridan ajralmas uchta tarkibiy qismdan iborat:

“O‘zlik tasavvuri” *(self-representation)*: muayyan vaziyat yoki lahzada shaxsning o‘zi haqidagi ichki psixologik tasavvuri va o‘zini qanday his etishi.

“Obyekt tasavvuri” *(object-representation)*: bunda shaxs uchun muhim bo‘lgan boshqa inson, ya’ni “obyekt” haqidagi ichki psixologik tasavvur yoki uning ongda shakllangan modeli tushuniladi.

“Affektiv holat” *(affective state)*: o‘zlik tasavvuri bilan obyekt tasavvurini bir-biri bilan uzviy bog‘lab turuvchi kuchli emotsional kechinma yoki psixik turtki. Bunga muhabbat, g‘azab, qo‘rquv, quvonch kabi kuchli emotsional holatlar misol bo‘la oladi.

2. Shaxsning uchta strukturaviy kriteriyasi. Kernberg shaxsning umumiy psixologik holati, barqarorligi va tuzilishini uchta asosiy mezon asosida baholaydi:

Identifikatsiyaning integratsiyalashuvi *(identity integration)*: bu vaqt davomida o‘zini va boshqa insonlarni yaxlit, uzluksiz va murakkab tarzda idrok etish qobiliyatidir. Sog‘lom psixologik strukturada identifikatsiya integratsiyalashgan bo‘ladi. Patologik strukturada esa identifikatsiya diffuziyasi *(identity diffusion)* kuzatiladi. Bunda shaxsning o‘zi haqidagi tasavvuri yaxlitligini yo‘qotib, parchalangan, ziddiyatli, noaniq va beqaror tus oladi.

Himoya mexanizmlari *(defense mechanisms*): bunda psixikaning xavotir va ichki ziddiyatlarni boshqarish uchun foydalanadigan psixologik jarayonlari tushuniladi.

Yuqori darajadagi himoya mexanizmlari *(mature/advanced defenses)*: asosan, repressiya, intellektualizatsiya va ratsionalizatsiya kabi mexanizmlarga tayanadi. Ularning ustunligi odatda nisbatan sog‘lom yoki nevrotik darajadagi shaxs strukturasidan dalolat beradi.

Primitiv himoya mexanizmlari *(primitive defenses)*: asosan, “splitting” – bo‘lib qo‘yish *(o‘zini va boshqalarni “mutlaqo yaxshi” yoki “mutlaqo yomon” tarzda baholash)*, proyektiv identifikatsiya, ekstremal idealizatsiya va qadrsizlantirish kabi mexanizmlarni o‘z ichiga oladi. Bunday himoya mexanizmlarining ustunligi og‘ir darajadagi shaxs buzilishlariga xosdir.

Reallikni tekshirish *(reality testing)*: bu esa shaxsning o‘z psixikasida sodir bo‘layotgan hodisalarni aniqrog‘i, ichki psixologik reallikni tashqi olamda amalda sodir bo‘layotgan hodisalardan, ya’ni tashqi obyektiv reallikdan farqlay olish qobiliyati sanaladi. Bu shuningdek, o‘z xulq-atvorini jamiyatda qabul qilingan odatiy me’yorlar bilan solishtirib, uning mos yoki mos emasligini baholash qobiliyatini ham nazarda tutadi.

Kernberg shaxs tuzilmasini faoliyat ko‘rsatishning uchta darajasiga ajratadi. Aniqrog‘i, u yuqorida keltirilgan uchta kriteriyani birgalikda qo‘llash orqali shaxsning umumiy psixologik tuzilishini faoliyat ko‘rsatishning uchta alohida darajasiga ajratadi:

Nevrotik shaxs tuzilmasi *(eng yuqori daraja)*: identifikatsiyaning integratsiyalashuvi, yetuk himoya mexanizmlaridan (xususan, repressiyadan) foydalanish hamda reallikni tekshirish qobiliyatining saqlanganligi bilan tavsiflanadi.

Chegaraviy shaxs tuzilmasi *(oraliq daraja)*: identifikatsiya diffuziyasi, primitiv himoya mexanizmlariga (xususan, splitting – bo‘lib qo‘yishga) tayanish, biroq reallikni tekshirish qobiliyatining asosan, saqlanganligi bilan tavsiflanadi.

Psixotik[43] shaxs tuzilmasi *(eng og‘ir daraja)*: identifikatsiya diffuziyasi, primitiv himoya mexanizmlarining ustunligi hamda reallikni tekshirish qobiliyatining to‘liq buzilishi bilan tavsiflanadi. Bunda shaxs real voqelikni aldanishlar va galyutsinatsiyalardan farqlash qobiliyatini yo‘qotadi.

“**O‘zlik psixologiyasi**” *(self psychology)* yo‘nalishi asoschisi Haynts Kohutga ko‘ra esa shaxsning psixologik tuzilishi Freyddagi kabi ichki biologik mayllar id, ego va superego o‘rtasidagi ziddiyatga asoslanmaydi. Aksincha, uning nazariyasida psixologik tuzilmaning markaziy negizini “Self”, ya’ni “o‘zlik” tashkil etadi. O‘zlik inson uchun muhim bo‘lgan munosabat tajribalari orqali shakllanadi, tartibga keladi va barqarorligini saqlab turadi.

Shaxs tuzilmasiga oid Kohut modelining aniq va ilmiy jihatdan tizimlashtirilgan tavsifi quyidagicha:

1. Asosiy struktura: ikki qutbli o‘zlik. Kohut shaxsni oraliq bir soha orqali o‘zaro bog‘langan “ikki qutbli” tuzilma sifatida konseptuallashtiradi.

[43] Psixozga chalingan shaxs.

Ushbu oraliq soha ko‘pincha “ruhiy taranglik dinamikasi” *(tension arc)* deb ataladi. Mazkur tuzilma uchta tarkibiy qismdan iborat:

1-qutb: Ulug‘vor o‘zlik *(ambitsiyalar qutbi)*: shaxsning o‘z qadrini his qilishi, hayotiy faolligi hamda muvaffaqiyatga, kuch va e’tirofga intilishining psixologik negizini tashkil etadi. Ushbu qutbning sog‘lom shakllanishi uchun atrofdagilarning “oynadek aks ettirishi” *(mirroring)*, ya’ni shaxsning borligi va erishgan yutuqlariga empatik munosabat bildirish, ularni tasdiqlash, ma’qullash hamda samimiy quvonch bilan javob qaytarishi zarur.

2-qutb: Ideallashtirilgan ota-ona obrazi *(ideallar qutbi)*: ushbu qutb shaxsning asosiy qadriyatlari, hayotiy yo‘nalishlarini belgilovchi tamoyillari hamda o‘z-o‘zini tinchlantirish va ruhiy jihatdan barqarorlashtirish qobiliyatini ifodalaydi. U shaxs o‘zidan kuchli, xotirjam va deyarli xatosiz, deb qabul qilinadigan shaxslarni o‘ziga namuna sifatida ko‘rishi hamda ulardan ruhiy kuch olishi imkoniga ega bo‘lgan sharoitda shakllanadi. Bu jarayon Kohutda “ideallashtirish” ehtiyoji *(idealization)* bilan bog‘lanadi.

Oraliq soha *(Egizaklik/Alter-Ego)*: ambitsiyalar va ideallar qutblarini o‘zaro bog‘lab turuvchi psixologik ko‘prik. U shaxsga xos tabiiy iste’dod va qobiliyatlarni qamrab oladi. Mazkur soha “egizaklik” ehtiyoji boshqa insonlar bilan o‘zini muayyan jihatdan tubdan o‘xshash, ularga mansub va ular bilan ruhiy yaqin, deb his qilishga bo‘lgan fundamental ehtiyoj asosida harakatga keladi.

2. Strukturaviy bog‘lovchi tizim: “Selfobyekt”lar matritsasi. Kohut modelining muhim jihatlaridan biri shundaki, psixologik tuzilma hech qachon mutlaqo mustaqil holda mavjud bo‘lmaydi. “Self” (o‘zlik) o‘zining barqarorligini ta’minlash uchun “Selfobyekt”larga tayanadi.

“Selfobyekt”: shaxs subyektiv jihatdan “o‘zligi”ning funksional davomi yoki tarkibiy qismi sifatida idrok etadigan tashqi insonlar, guruhlar va hatto e’tiqod tizimlaridir. Inson butun hayoti davomida strukturaviy barqarorlikni

saqlab turish uchun unga atrofdagilarning “oynadek aks ettirishi” *(mirroring)*, “ideallashtirish” ehtiyoji *(idealization)* va “egizaklik” ehtiyoji *(twinship ehtiyoj)*larini qondiradigan uzluksiz selfobyektlar matritsasi zarur bo‘ladi.

3. Strukturaviy salomatlik va patologiya.

Yaxlit o‘zlik *(sog‘lom holat)*: “Selfobyekt” ehtiyojlari yetarli darajada qondirilganda, shaxs barqaror va yaxlit o‘zlik tuzilmasini shakllantiradi. Bunday tuzilma o‘z qadrini barqaror saqlash, emotsiyalarni boshqarish hamda mazmunli maqsadlarni belgilab, ularga intilish imkonini beradi.

O‘zlikning parchalanishi *(patologik holat)*: Kohut shaxs buzilishlarini, ayniqsa narsissistik shaxs[44] buzilishini, psixologik ziddiyat natijasi sifatida emas, balki strukturaviy yetishmovchilik sifatida talqin qiladi. Rivojlanish jarayonida “Selfobyekt”larning surunkali ravishda o‘z funksiyasini bajarmasligi, ya’ni shaxsni aks ettirib, uning kechinmalari va yutuqlarini tasdiqlovchi yoki ideallashtiriladigan tayanch shaxslarning yetishmasligi natijasida o‘zlik tuzilmasi zaif, ichki mazmuni bo‘sh yoki parchalanishga moyil bo‘lib qoladi. Bu esa depressiv holatlar, o‘zini haddan tashqari ulug‘lash yoki o‘z qadrini mutlaqo yo‘qotgandek his qilish kabi holatlarga olib kelishi mumkin.

XULOSA

Darhaqiqat, Otto Kernberg va Haynts Kohut shaxs strukturasini turli nazariy asoslardan kelib chiqib talqin qilgan bo‘lsalar-da, har ikki yondashuvda shaxsning psixologik tuzilishi uning boshqa insonlar bilan munosabatlari va ushbu munosabatlarning ichki psixik tajribaga aylanishi bilan chambarchas bog‘liq holda tushuntiriladi. Kernberg shaxs strukturasining barqarorligini o‘zlik va obyekt tasavvurlarining integratsiyalashuvi, himoya mexanizmlari hamda reallikni tekshirish qobiliyati orqali izohlab, patologiyani ushbu tizimlarning buzilishi bilan bog‘laydi. Kohut esa shaxs rivojlanishining markaziga “Self”ni

[44] O‘z qadrini haddan tashqari yuqori baholashga moyil, boshqalarning e’tirofi va maqtoviga kuchli ehtiyoj sezuvchi, o‘zlikni qadrlash va barqarorligini saqlashda narsissistik ehtiyojlar muhim o‘rin tutadigan shaxs.

qo‘yib, uning yaxlitligi va barqarorligini “selfobyekt munosabatlari”, empatik aks ettirish, ideallashtirish va egizaklik ehtiyojlarining qondirilishi bilan izohlaydi. Shu jihatdan, Kernberg yondashuvida asosiy e’tibor shaxs strukturasining integratsiyalashuv darajasi va uning patologik buzilishlariga, Kohut yondashuvida esa o‘zlikning yaxlitligi, barqarorligi va rivojlanish ehtiyojlariga qaratilgan. Demak, mazkur ikki konsepsiyani bir-biriga zid emas, balki shaxs strukturasining turli tomonlarini yorituvchi o‘zaro to‘ldiruvchi yondashuvlar sifatida ko‘rish mumkin: Kernberg shaxsning qanday tuzilganligi va qanchalik integratsiyalashganligini, Kohut esa uning qanday shakllanishi, barqarorligini nimalar ta’minlashi va munosabatlar orqali qanday rivojlanishini chuqurroq ochib beradi.

FOYDALANILGAN ADABIYOTLAR:

1. Duane P. Schultz, Sydney Ellen Schultz, and Heather M. Maranges, “Theories of personality” (Twelfth edition). – Boston, MA: “Cengage Learning”, 2024. – 540 p.
2. Kernberg O. F. The Inseparable Nature of Love and Aggression: Clinical and Theoretical Perspectives. – Washington, DC: American Psychiatric Publishing, 2011. – 384 p.
3. Kohut H. The Restoration of the Self. – New York: International Universities Press, 1977. – 360 p.
4. Freud S. The Ego and the Id. – London: The Hogarth Press and the Institute of Psycho-Analysis, 1961. – 66 p.
5. Фрейд Зигмунд. “Я” и “Оно”. Сборник. М.: Азбука, Азбука-Аттикус, 2015. - 288 с.

JADID MUTAFAKKIRLARI MEROSIDA MEHNAT QADRIYATLARI

Rajabov Ilxom Mustafoyevich

“NKMK” Aksiyadorlik jamiyati Markaziy kon boshqarmasi, Boshqarma Ofis menejer bo‘limi Axborot va ma'naviyat – ma'rifat guruhi rahbari

Annotatsiya. *Ushbu tezisda XIX asr oxiri – XX asr boshlarida Turkistonda shakllangan jadidchilik harakati namoyandalarining mehnat va mehnat qadriyatlariga doir ijtimoiy-ma’rifiy qarashlari tahlil qilingan. Jadid mutafakkirlari merosida mehnatning inson kamoloti, jamiyat taraqqiyoti va milliy yuksalishning muhim omili sifatidagi o‘rni ochib berilgan. Abdulla Avloniy, Mahmudxo‘ja Behbudiy, Munavvarqori Abdurashidxonov va Abdurauf Fitrat qarashlari misolida halol mehnat, mehnatsevarlik, kasb-hunar egallash, amaliy bilim va ijtimoiy mas’uliyatning shaxs tarbiyasidagi ahamiyati yoritilgan.*

Kalit so‘zlar: *jadidchilik, jadid mutafakkirlari, mehnat, mehnat qadriyatlari, mehnatsevarlik, kasb-hunar, mehnat tarbiyasi, inson kamoloti, milliy taraqqiyot, ijtimoiy mas’uliyat, ma’naviy-axloqiy tarbiya, yoshlar.*

Abstract. *This thesis analyzes the socio-educational views of the representatives of the Jadid movement, which emerged in Turkestan in the late nineteenth and early twentieth centuries, concerning labor and labor values. It examines the role of labor in the intellectual heritage of the Jadid thinkers as an essential factor in human development, social progress, and national advancement. Drawing on the views of Abdulla Avloni, Mahmudkhoja Behbudi, Munavvarqori Abdurashidkhonov, and Abdurauf Fitrat, the study highlights the importance of honest work, diligence, vocational skills, practical knowledge, and social responsibility in personal development and education.*

Keywords: *Jadidism, Jadid thinkers, labor, labor values, work ethic, vocational skills, labor education, human development, national progress, social responsibility, moral education, youth.*

KIRISH

XIX asr oxiri – XX asr boshlarida Turkiston ijtimoiy tafakkurida jadidchilik harakati muhim o‘rin egallaydi. Jadid ma’rifatchilari jamiyatni

modernizatsiya qilish, milliy taraqqiyotga erishish va ijtimoiy ongni yuksaltirishga qaratilgan g‘oyalarni ilgari surganlar. Ularning qarashlarida mehnat qadriyatlari alohida o‘rin tutadi.

Jadid mutafakkirlari mehnatni inson kamolotining muhim omili, jamiyat taraqqiyotining asosiy sharti sifatida baholaganlar. Ular mehnatga hurmat, kasb-hunar egallash va halol mehnat orqali jamiyat farovonligini ta’minlash mumkinligini ta’kidlaganlar.

Tadqiqotchilarning fikricha, jadidlar tomonidan ilgari surilgan mehnat qadriyatlari milliy uyg‘onish jarayonining muhim tarkibiy qismi hisoblanadi [5:56].

Jadid ma’rifatchilari mehnatni inson hayotining asosiy mazmuni va jamiyat taraqqiyotining muhim omili sifatida talqin qilganlar. Ular yosh avlodni halol mehnat qilishga, kasb-hunar egallashga va jamiyat rivojiga hissa qo‘shishga da’vat etganlar.

Masalan, Abdulla Avloniy o‘zining mashhur “Turkiy guliston yoxud axloq” asarida mehnat tarbiyasiga alohida e’tibor qaratadi. U shunday yozadi:

“Har bir inson o‘z mehnati bilan yashasa, jamiyatda tartib va farovonlik qaror topadi” [1:45].

Avloniy fikricha, mehnat nafaqat iqtisodiy faoliyat, balki insonning ma’naviy kamolotiga xizmat qiluvchi muhim omildir.

Shuningdek, Mahmudxo‘ja Behbudiy ham jamiyat taraqqiyotida mehnat va kasb-hunar egallash muhim o‘rin tutishini ta’kidlagan. U millat taraqqiyoti uchun savodxonlik, hunarmandchilik va ishlab chiqarish rivojlanishi zarurligini qayd etadi [2:32].

Behbudiy fikricha, millat taraqqiyotining asosiy sharti – ilm va mehnatdir. Shu sababli u yoshlarni hunar o‘rganishga va iqtisodiy faoliyat bilan shug‘ullanishga undagan.

Jadid pedagogikasida mehnat tarbiyasi muhim o‘rin egallaydi. Jadidlar yosh avlodni nafaqat bilimli, balki mehnatsevar va mas’uliyatli shaxslar sifatida tarbiyalash zarurligini ta’kidlaganlar.

Masalan, Munavvarqori Abdurashidxonov ta’lim jarayonida nazariy bilim bilan bir qatorda amaliy ko‘nikmalar ham muhim ekanini qayd etadi. Uning fikricha, maktablarda kasb-hunar asoslarini o‘rgatish jamiyat taraqqiyotiga xizmat qiladi [3:61].

Shuningdek, Abdurauf Fitrat ham yoshlarni mehnatsevarlik ruhida tarbiyalash zarurligini ta’kidlagan. U jamiyat taraqqiyoti uchun ilm-fan bilan bir qatorda ishlab chiqarish va iqtisodiy faoliyat ham rivojlanishi kerakligini qayd etadi [4:74].

Fitratning fikricha, millat taraqqiyotiga erishish uchun har bir inson jamiyat rivojiga o‘z mehnati bilan hissa qo‘shishi zarur.

Bugungi kunda jadid mutafakkirlari merosida ilgari surilgan mehnat qadriyatlari o‘z dolzarbligini saqlab qolmoqda. Zamonaviy jamiyatda ham mehnatsevarlik, kasb-hunar egallash va ijtimoiy mas’uliyat muhim ahamiyat kasb etadi.

Tadqiqotchilar ta’kidlashicha, jadidlar tomonidan ilgari surilgan mehnat qadriyatlari yosh avlodni tarbiyalashda muhim nazariy manba hisoblanadi [6:83].

Shu sababli jadid mutafakkirlarining pedagogik va ijtimoiy qarashlarini o‘rganish bugungi ta’lim tizimi uchun ham muhim ahamiyatga ega.

Jadid mutafakkirlari merosida mehnat qadriyatlari muhim o‘rin egallaydi. Ular mehnatni inson kamolotining muhim omili va jamiyat taraqqiyotining asosiy sharti sifatida baholaganlar. Ular tushungan ediki, erkin va ongli mehnatgina shaxsni ruhan boyitadi, uning qalbini poklaydi, aql-idrok darajasini oshiradi. Mehnat – bu nafaqat moddiy ne’matlar manbai, balki insoniyatning axloqiy poydevori hisoblanadi.

Shu sababli jadidlar ta’lim-tarbiya tizimini isloh qilishda mehnatga alohida e’tibor berishgan. Ular maktab darslariga hunar o‘rgatishni, qo‘l mehnatini joriy etishni asosiy vazifa deb bildilar. O‘quvchilar darsdan tashqari vaqtda bog‘dorchilik, tikuvchilik, kulolchilik kabi amaliy kasblar bilan shug‘ullanishi kerak edi. Buning maqsadi nafaqat kelajakda o‘z o‘zi uchun moddiy poydevor yaratish, balki yosh avlodni mehnat qadrlari bilan tarbiyalash edi.

Jamiyat taraqqiyoti uchun mehnatning ahamiyati haqidagi fikrlar ularning barcha faoliyatiga singib ketgan. Matbuot orqali ular mehnatsevarlik g‘oyalarini targ‘ib qilishdi, hunarmandchilik va savdo-sotiqni rivojlantirish zarurligi haqida yozishdi. Iqtisodiy mustaqillik sari bo‘lgan yo‘lda mehnatgina hal qiluvchi kuch ekanligini ta’kidladilar. O‘z xalqining qiyinchiliklarga bardoshli, mehnatsevar ekanini ular chuqur hurmat qilishardi va aynan shu fazilatlarni yanada rivojlantirishga chaqirishardi.

Ular uchun mehnat qadriyatlari nafaqat iqtisodiy, balki milliy o‘zlikni saqlash vositalaridan biri edi. O‘z qo‘l mehnati bilan yaratilgan narsalar, o‘z mehnati bilan qoplanadigan dasturxon milliy madaniyatning janglmaydigan tarkibiy qismi hisoblangan. Shu nuqtai nazardan, hunarmandchilikni o‘rganish va rivojlantirish vatanparvarlikning amaliy ko‘rinishi sifatida talqin qilingan.

Bundan tashqari, jadidlar mehnatni insonlar tengligining asosi deb hisoblashgan. Har kim o‘z mehnati, o‘z bilimi va salohiyati evaziga jamiyatdagi o‘rnini topishi kerak edi. Bu g‘oya ularning taraqqiyparvar va demokratik qarashlarining muhim jihati bo‘lib, uning orqasida har bir insonning qadr-qimmatini mehnati bilan belgilash tamoyili yotadi.

Shunday qilib, jadidiyat harakatining yetakchilari mehnatni butun hayotiy falsafaning markaziga qo‘ydilar. Uning orqali inson kamoloti, jamiyat farovonligi, milliy mustaqillik va madaniyatning saqlanishi g‘oyalarini uyg‘unlashtirishga harakat qilishdi. Bu qadriyatlar bugungi kunda ham o‘z

ahamiyatini yo‘qotmagan va muasir taraqqiyot yo‘lida qimmatli manba hisoblanadi.

Jadid ma’rifatchilari yosh avlodni mehnatsevarlik, kasb-hunar egallash va ijtimoiy mas’uliyat ruhida tarbiyalash zarurligini ta’kidlaganlar. Ularning qarashlari bugungi kunda ham yoshlarni tarbiyalash va jamiyat taraqqiyotini ta’minlashda muhim nazariy asos bo‘lib xizmat qiladi.

FOYDALANILGAN ADABIYOTLAR

1. Abdulla Avloniy. Turkiy guliston yoxud axloq. – Toshkent: O‘qituvchi, 1992. – 45-bet.
2. Mahmudxo‘ja Behbudiy. Tanlangan asarlar. – Toshkent: Ma’naviyat, 1999. – 32-bet.
3. Munavvarqori Abdurashidxonov. Tanlangan asarlar. – Toshkent: Sharq, 2003. – 61-bet.
4. Abdurauf Fitrat. Tanlangan asarlar. – Toshkent: Ma’naviyat, 2000. – 74-bet.
5. Begali Qosimov. Jadidchilik. – Toshkent: Sharq, 2004. – 56-bet.
6. Naim Karimov. Jadid adabiyoti va milliy uyg‘onish. – Toshkent: Fan, 2001. – 83-bet.

THE ROLE OF PHYSICAL CULTURE IN THE PROCESS OF SOCIAL REPRODUCTION: SOCIO-PHILOSOPHICAL ANALYSIS

O‘ktamova Dilfuza O‘ktamovna

Navoiy davlat universiteti doktoranti,

Ijtimoiy falsafa yo‘nalishi

E-mail: *tturobkulov@gmail.com*

Tel: +998 91 4390470

ORCID: *ID 0009-0008-5363-1048*

Уктамова Дилфуза Уктамовна

докторант Навоийского государственного университета, специальность «Социальная философия»

E-mail: *tturobkulov@gmail.com*

ORCID ID: *0009-0008-5363-1048*

Uktamova Dilfuza Uktamovna

Doctoral Student at Navoi State University,

Specialization: Social Philosophy

E-mail: *tturobkulov@gmail.com*

ORCID ID: *0009-0008-5363-1048*

Аннотация: *Мазкур мақолада ижтимоий-фалсафий категория сифатида «ижтимоий такрор ишлаб чиқариш» тушунчасининг моҳияти, таркибий қисмлари ва жисмоний маданиятнинг ушбу жараёндаги ўрни таҳлил қилинади. Турли социологик ва фалсафий ёндашувлар асосида инсон ва жамиятни такрор ишлаб чиқариш тушунчасининг кўп қиррали талқинлари кўриб чиқилади ҳамда жисмоний маданиятнинг шахсни, оилани ва жамиятни соғломлаштиришдаги функционал*

аҳамияти очиб берилади. Хорижий давлатлар (Дания, Нидерландия, Финляндия, Германия, Швейцария, Англия, Швеция) тажрибаси мисолида «ҳамма учун спорт» концепциясининг ижтимоий такрор ишлаб чиқариш жараёнидаги роли ёритилади. Тадқиқот якунида жисмоний маданиятнинг замонавий жамиятда етарлича баҳоланмаётганлигининг сабаблари аниқланади ва бу борада хулосалар шакллантирилади.

***Калит сўзлар**: ижтимоий такрор ишлаб чиқариш, жисмоний маданият, инсон салоҳияти, демографик такрор ишлаб чиқариш, ижтимоийлашув, оила институти, ҳамма учун спорт.*

***Аннотация:** В статье анализируется сущность и структурные компоненты социально-философской категории «социальное воспроизводство», а также роль физической культуры в данном процессе. На основе различных социологических и философских подходов рассматриваются многогранные трактовки понятия воспроизводства человека и общества, раскрывается функциональное значение физической культуры в оздоровлении личности, семьи и общества. На примере зарубежного опыта (Дания, Нидерланды, Финляндия, Германия, Швейцария, Англия, Швеция) анализируется роль концепции «спорт для всех» в процессе социального воспроизводства. По итогам исследования выявлены причины недостаточной оценки роли физической культуры в современном обществе и сформулированы соответствующие выводы.*

***Ключевые слова**: социальное воспроизводство, физическая культура, человеческий потенциал, демографическое воспроизводство, социализация, институт семьи, спорт для всех.*

***Abstract:**This article analyzes the essence and structural components of the socio-philosophical category of "social reproduction" and the role of physical culture within this process. Drawing on various sociological and philosophical approaches, the article examines multifaceted interpretations of the concept of reproduction of the human being and society, and reveals the functional significance of physical culture in improving the health of the individual, the family, and society. Using the experience of foreign countries (Denmark, the Netherlands, Finland, Germany, Switzerland, England, Sweden) as an example, the role of the "sport for all" concept in the process of social reproduction is analyzed. The study identifies the reasons for the insufficient appreciation of the role of physical culture in contemporary society and formulates corresponding conclusions.*

Keywords: *social reproduction, physical culture, human potential, demographic reproduction, socialization, family institution, sport for all.*

INTRODUCTION

At the present stage of social development, the qualitative reproduction of the human factor is becoming one of the urgent socio-philosophical problems. If social reproduction in a broad sense is a multifaceted process that covers all spheres of society, then in a narrow sense it manifests itself as a continuous change of generations of humanity. The relevance of the topic lies in the fact that there is no single, generally accepted interpretation of the concept of "social reproduction" in social science, and the role of physical culture in this process has not been sufficiently assessed.

The purpose of the study is to analyze the essence and components of the category of social reproduction from a socio-philosophical point of view and to reveal the functional significance of physical culture in this process. To achieve this goal, the following tasks were set: to conduct a comparative analysis of the interpretations of the concept of "social reproduction" in various disciplines; to identify the functions of physical culture in the reproduction of the individual, family and society; review of the practice of the concept of "sport for all" on the example of the experience of foreign countries; to identify the main obstacles in the implementation of this process in the national context.

MATERIALS AND METHODS

The theoretical and methodological basis of the research was formed by the scientific views of scientists devoted to the problems of social reproduction and physical culture, including V.V. Muravev [7], M.P. Buzsky [14], Yu.V. Manko and V.F. Tsymlov [12], as well as A.A. Isaev's (1998) studies, definitions in socio-philosophical and sociological dictionaries and other sources. Statistical data on the practice of physical culture and "sports for all" programs in foreign

countries (Denmark, Netherlands, Finland, Germany, Switzerland, England, Sweden) were used as empirical material [10][11].

The following methods were used in the research process: the method of analysis and synthesis of scientific literature - to summarize the definitions of various authors regarding the concept of "social reproduction"; comparative-historical method — to compare the stages of historical development of the concept and the experience of different countries; systemic-structural approach — to determine the components of social reproduction (health care, increasing activity, socialization, etc.); method of logical generalization — to form conclusions at the end of the research.

RESULTS

By synthesizing definitions from the social sciences, it has been determined that the reproduction of the human population is understood as a specific form of social production—encompassing both productive and non-productive sectors—that ensures the continuous succession of generations, the preservation and improvement of public health, and the advancement of educational and cultural levels[1]. Reproduction is defined as a constant and uninterrupted process of renewal that ensures the maintenance of normal human life activities and working capacity[2].

The study identified three key components of social reproduction: the restoration of human energy (resting the body after work), health preservation (disease prevention and life extension), and the enhancement of vitality (ensuring individuals are refreshed and ready for work each day). At the same time, interpretations of the concept of social reproduction were identified—ranging from the process of self-development and self-renewal of social systems and the reproduction of material goods, social norms, and values [3], to the process of preserving society's social institutions and structures, as well as the

prevailing mode of production and model of social relations [4]—demonstrating that the concept is multifaceted.

It was determined that physical culture manifests itself in the process of social reproduction in three ways: first, it contributes to the reproduction of labor potential (materialized labor power) by cultivating the necessary qualities and psychophysical capabilities of the individual; second, it indirectly supports demographic reproduction by enhancing the reproductive functions of men and women; and third, it shapes general culture and aids in personal self-organization through adherence to routines of daily physical activity. An analysis of the experience of foreign countries has shown that between 40% and 60% of the population in developed nations views physical culture as an indicator of life success and personal fulfillment[10]. Notably, while bicycle lanes are widespread in Denmark and Belgium, the Netherlands boasts a total network exceeding 10,000 km; meanwhile, the capital of Finland features over 1,300 km of such lanes, with a ratio of 400,000 bicycles to a city population of 560,000[10].

In Germany, physical culture is implemented as an integral part of state policy through specialized programs targeting various social groups—including those at risk of illness, prison inmates, the unemployed, individuals with substance abuse issues, and foreign nationals. Sport serves as a tool for stress relief and obesity prevention in Switzerland, a means of engaging with youth in England, a component of elderly care in Germany, and a method for addressing ethical issues in Sweden[11].

DISCUSSION

The results obtained confirm that the concept of social reproduction lacks a unified interpretation in academic discourse. This situation stems, on the one hand, from the concept's multifaceted and integral nature and, on the other, indicates a lack of a holistic methodological approach in this field. Therefore, it

is appropriate to view social reproduction from the perspective of the individual and society—as a process of continuous movement and the regeneration of the social system's life.

A contradictory situation arises when assessing the role of physical culture in social reproduction: while it is theoretically acknowledged as crucial for the recreation of the individual and social integrity, these functions are not fully realized in practice. The primary reasons for this are that existing programs and concepts are designed for individuals with specific worldviews and needs, and that many people adopt an infantile attitude toward improving their own lifestyles. An analysis of the role of the family institution reveals that, amidst globalization, the family is undergoing a profound crisis and is not fully aligned with the system of norms and values proposed by the prevailing regime[13]. If the task of societal reproduction is not prioritized in family policy, such a society lacks long-term prospects, as demographic and cultural continuity is ensured precisely through the family.

An examination of the state's role in shaping the "ideal" individual reveals that the value system dominant in modern society—characterized by profit, commodity-money relations, and capital accumulation—often conflicts with the goal of reproducing a well-rounded individual[14]. As M.P. Buzsky notes, this leads to an underestimation of the role played by the process of social reproduction in shaping the integral human being[14].

From a historical-philosophical perspective, the crisis that engulfed humanity at the turn of the 20th and 21st centuries is explained by the need to transition from a technogenic civilization to an anthropogenic one—a shift defined not by technology, but by the human dimension[12]. This necessitates orienting the education and upbringing system toward shaping not merely a specialist, but an individual—an active and creative subject of the historical process.

A comparison of foreign (particularly Western European) experience with national conditions clearly reveals a disparity in the institutional status of physical culture: while Western nations view it as a priority for the state and a factor in social equality, its potential remains undervalued in many other countries. Therefore, implementing the "sport for all" concept—adapted to national conditions—is a crucial factor in enhancing the effectiveness of social reproduction.

CONCLUSION

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

1. Physical culture in society can and should play an important role in the process of recreating the personality and social integrity, but in modern conditions these functions are not fully implemented. The main reason is the fact that existing programs and concepts are designed for a person with a certain worldview and needs, as well as the infantile attitude of many people to the lifestyle.

2. The most important social unit in which the physical improvement of a person occurs is the family. If the task of recreating society is not a priority in family policy, such a society will have no long-term prospects, since demographic reproduction creates the opportunity to form a personality for the future society through intergenerational cohesion.

3. Socialization should be viewed as the process of assimilating a system of knowledge, norms and values that allow a person to function as a full member of society. The state should be the main "customer" in the formation of the "standard" of the individual from the point of view of physical improvement, but the system of values in modern society often works against this.

4. The process of social reproduction remains undervalued not only at the individual, but also at the level of society and the state - its role in the formation of a holistic person, overcoming technocracy, and implementing the historical

process does not have a clear methodological assessment. Eliminating this problem is one of the priority areas of future research.

LIST OF REFERENCES

Kanke V. A. Osnovnye filosofskie napravleniya i kontseptsii nau¬ki. Itogi XX century: uchebnoe posobie. - M.: Logos, 2000. - 320 p.

Kant I. Criticism is understandable. - M.: "Eksmo", 2006.

Kant I. Kritika chistogo razuma / Immanuil Kanat; [per. s nem.; predisl. I. Evlampieva]. -M.: Exmo; SPb.: Midgard, 2007. - 1120 p.

Kachenovsky, M.B. Introduction to valeological pedagogy / M.B. Kachenovsky. - Minsk, 1997. - 183 p.

Kemerov, V. E. Problema lichnosti: metodologiya issledovaniya i zhiznennyy smysl / V.E. Kemerov. - M., 1977. - 326 p.

Kovaleva, A.I. Socialization lichnosti. Norma i eklonenie / A.I. Kovaleva. - M., 1996. - 158p.

Kolomiets, V.P. Stanovlenie individualnosti / V.P. Kolomiets. - M.: izd-vo MGU, 1993. - 189p.

Kostyukov, V.V. Organizational-technological aspects of health-related activities, sportive and recreational games with people of all ages / V.V. Kostyukov // Theory and practice of physical culture. - 1996. -#1.- S.7-11.

Kryukova, E.A. Lichnostno-razvivayushchie obrazovatelnye tehnologii: nature, design, implementation: Monograph / E.A. Kryukova. — Volgograd: Peremena, 1999. - 195p.

Kurakov, L.P. Russia - the 21st century: contour of the new world of peace / L.P. Kurakov. - M.: Vuz i shkola, 2003. - 369 p.

Leontev, A.N. Izbr. psycho. proizv / A.N. Leontev. - M.: 1986. - 356p.

Lishchuk, V.A., Mostkova, E. V. Technology povyshenia lichnogo zdoro¬vya /V.A. Lishchuk, E.V. Mostkova. - M, 1999. - 175p.

Lomov, B.F. Methodological and theoretical problems of psychology/ B.F. Lomov. - M., 1984. - 354p.

Lubysheva, L.I. Konkretno-sotsiologicheskie issledovaniya style jiz¬ni kak chast obshcherossiyskoy sistemy monitoringa fizicheskogo zdo¬rovya naseleniya, fizicheskogo razvitiya detey, podrostkov i molodeji / L.I. Lubysheva. conf. - Nalchik: Kab.-Balk. flour - 2003.- S. 64-68.

Lubysheva, L.I. Sovremennyi chennostnyi potenziali fizicheskoy kultury i sporta i puti ego osvoeniya obshchestvom i lichnostyu / L.I. Lubysheva // Theory and practice of physical culture. - 1997. - No. 6. - P.10-15.

Lubysheva, L.I. Sportivnaya kultura - faktor sotsializatsii studen¬tov / L.I. Lubysheva. Sat. material XVIII mejvuzov¬skoy nauchno-method. conf. (June 15-16, 2004). - Perm. - 2004. - P.21-29.

UDC 392.5:39(575.1)

CERTAIN CUSTOMS PRACTICES UPON THE ARRIVAL OF A BRIDE ("KELIN") IN THE LIFE OF UZBEKS LIVING ON THE LEFT BANK OF THE AMU DARYA

Sarbinaz Rustemovna Muratbaeva

https://orcid.org/0009-0007-9410-7413

sarbinazmuratbaeva@gmail.com

Researcher, Karakalpak Social Sciences Research Institute, Karakalpak Branch of the Academy of Sciences of Uzbekistan (179 A Amir Temur Street, Nukus, 230100, Republic of Karakalpakstan, Uzbekistan)

Abstract: *The article discusses the customs performed during family ceremonies when a "kelin" (bride) arrives among the Uzbeks living on the left bank of the Amu Darya. In particular, customs related to the fire cult when the bride arrives are studied comparatively with the beliefs of Uzbeks living around the Turtkul and Amu Darya districts, while family ceremonies regarding the "qonyq asy" (guest meal) and "ish berish" customs among Uzbek ethnic groups living in Chimbay and Kungrad districts were studied based on field notes.*

Keywords: *Uzbeks, custom, fire cult, qonyq asy, ish berish, mahr.*

INTRODUCTION

The history and spiritual heritage of the Uzbek people have deep roots, and family ceremonies are considered one of its most important components. Ceremonies act as an important institution reflecting the cultural traditions, social relations, and ethical values of every nation. Family ceremonies among Uzbeks encompass birth, child upbringing, marriage and wedding ceremonies, funeral and farewell traditions, and various ritual practices associated with them. Therefore, scientifically studying the family ceremonies of the Uzbeks living on the left bank of the lower Amu Darya is important not only in the fields of

ethnography and cultural anthropology, but also from the perspective of ensuring the stability of social life.

MAIN BODY

Thus, by the 40s–60s of the 20th century, a number of researchers initiated studies on family, marriage, and ceremonies conducted within the family, and we can witness that productive research work was carried out in this regard. Particularly, during the activities of the Khorezm Archaeological and Ethnographic Expedition organized starting from 1937, extensive fundamental scientific works were researched. Among these, in the scientific articles and monographs of N.P. Lobacheva [4, 298-333], G.P. Snesarev [7, 336], V.M. Sazonova [6, 113-142], and K.L. Zadykhina [9, 396], we can find interesting information about the family relations of the peoples living in this place.

In the modern era, Karakalpak ethnographer scientists have carried out several studies in studying the customs and life of Uzbeks living in Karakalpakstan. Among researchers, M. Khodzhanov's studies mainly present marriage weddings, matchmaking traditions, and peculiarities in funeral ceremonies of Uzbeks living in Karakalpakstan based on field records [2, 204-207]. In the studies of G. Khozhaniyazova, the mutual aid tradition called "zhabyv" given before the wedding, which is encountered in the life of Uzbeks living in Chimbay and Kungrad districts, is investigated [3, 89-94]. Customs and magical-character traditions performed after the arrival of a bride in the life of Uzbeks living in the territory of Kungrad and Chimbay districts have remained outside the researchers' attention.

We can observe the good preservation of the fire cult in the family ceremonies of the Uzbeks living on the left bank of the Amu Darya. If a bride is brought by "abduction" (*alyp qashyp*), she is purified by fire (*otaslaw*) and brought into the father-in-law's house. Bringing [the bride] into the house while purifying her with fire is also widespread among Uzbeks living in other

regions[10, 163]. This ceremony is considered a tradition performed directly with the participation of women. Such a tradition also exists in the life of Karakalpak people, where it differs in that Karakalpak people make the bride bow three times at the large entrance door, touch the door to her forehead three times with her hand, and enter with a bow.

Furthermore, we can witness that the tradition associated with the fire cult is also preserved at the time when the groom takes home the bride who was escorted and brought. In this process, the bride's "zhenghe" (female chaperone/relative) brings out a pre-prepared lit oil lamp (*shyra*). Attention is paid to ensuring that the fire of the lamp does not go out [Author's field notes, 2025]. If the fire goes out on the way, it is believed to bring misfortune and cause the young couple to be unhappy [8, 73].

Such a view is observed not only among Uzbeks, but frequently in the lives of other peoples living in the region. According to beliefs associated with the fire cult, if the fire goes out, it was considered a misfortune, and it was even believed that one of the young people would pass away [4, 22]. Regarding beliefs associated with the fire cult, we can see that the custom of keeping the fire in the lamp burning without extinguishing it for three days among Uzbeks living in Turtkul district, and for seven days among Uzbeks living in Amu Darya district, has been preserved to this day. Meanwhile, in the belief of Uzbeks living in the territory of Kungrad and Chimbay districts, such a custom of keeping a fire burning is not encountered. As for the basis of the belief in the fire cult, it is applied in the sense that when the bride arrives, harmful things should not reach her, evils should be driven away through fire, and the bride should be purified and cleansed.

After the bride enters through the door, and the magical-character actions related to the fire cult are concluded, she is seated in a specially prepared room. If the bride was brought through "abduction", the next day, after the visitors

coming to inquire have left and returned, a large "qonyq asy" (guest meal) is given to relatives and the village community. The "qonyq asy" is attended by close relatives, zhenghes, and sisters of the newly arrived bride. The "qonyq asy" ceremony is widespread among the Uzbek ethnic groups living in Kungrad and Chimbay districts. After the "qonyq asy", the marriage (*neke*) of the bride and groom is solemnized in the presence of relatives.

Basically, the "neke qiyuv" ceremony is one of the Islamic traditions, and although it stands out with its own local peculiarities in each region, it is formed based on Muslim rules. Several rules of it are discussed in our religion, including the property gift to the groom's wife, namely *mahr* (dowry/bridewealth). Specifically, it is written there that "the property allocated by the man to the wife (mahr) and other terms entering the marriage contract are also agreed upon at that time" [1, 185]. Like all Muslim ethnic groups, the Uzbek people have also preserved the giving of "mahr" (*Mahr – (Turkic mehr) – property allocated to the wife upon the establishment of an equal-rights marriage*) by the groom to the bride. Among the Uzbeks of Karakalpakstan, giving gold items (earrings, a ring) for mahr is widespread [Author's field notes, 2025].

CONCLUSION

As a result of the research, it was determined that the interconnection of archaic beliefs, Islamic traditions, and local customs is preserved in the family and marriage ceremonies of the Uzbeks living on the left bank of the Amu Darya. Traditions such as bringing the bride through fire purification, lighting a lamp, "qonyq asy", and giving mahr have not lost their significance to this day. In the content of these ceremonies, ideas of wishing happiness, prosperity, and good intentions to the family, as well as strengthening kinship ties, are dominant. At the same time, certain peculiarities in Kungrad, Chimbay, Turtkul, and Amu Darya districts indicate that the ceremonies were formed under the influence of the local ethno-cultural environment.

REFERENCES

1. **Islom ensiklopediyasi** (Vol. 1, p. 158, 185). (2004). O‘zbekiston milliy ensiklopediyasi.

2. **Khodzhanov, M. I.** (2024). Qoraqalpog‘istonda yashovchi o‘zbeklarning nikoh to‘yidan oldin bajariladigan urf-odatlari. In *Oraylik Aziyani izertlewler kontekstinde Qoraqalpog‘iston tariyxi: Xalqaro ilmiy-nazariy konferensiya materiallari* (pp. 204–207).

3. **Khozhaniyazova, G.** (2024). Qoraqalpog‘larda “nemewrin”, “jabyw”, “oramal saliw” dasturlari. *Vestnik Karakalpakskogo Otdeleniya Akademii Nauk Respubliki Uzbekistan*, 1, 89–94.

4. **Lobacheva, N.** (2001). Iz istorii verovaniy i obryadov: ogon' v svadebnom komplekse Khorezmskikh uzbekov (Po materialam serediny XX v.). *Etnograficheskoye Obozreniye*, 6, 22.

5. **Lobacheva, N. P.** (1975). Razlichnyye obryadovyye kompleksy v svadebnom tseremoniale narodov Sredney Azii i Kazakhstana. In *Domusulmanskiye verovaniya i obryady v Sredney Azii* (pp. 298–333). Nauka.

6. **Sazonova, M. V.** (1970). Ukrasheniya uzbekov Khorezma. *Sbornik Muzeya Antropologii i Etnografii*, 26, 113–142.

7. **Snesarev, G. P.** (1969). *Relikty domusulmanskikh verovaniy i obryadov u uzbekov Khorezma*. Nauka. (p. 336).

8. **Snesarev, G. P.** (1969). *Xorazmliklarning musulmonlikdan avvalgi marosimlari va urf-odatlari* (p. 73).

9. **Zadykhina, K. A.** (1952). Uzbeki delty Amu-Dar'i. *Trudy Khorezmskoy Arkheologo-Etnograficheskoy Ekspeditsii*, 1, 396.

10. **Zadykhina, K. L.** (1951). Perezhitki vozrastnykh klassov u narodov Sredney Azii. In *Rodovoye obshchestvo (etnograficheskiye materialy i issledovaniya)* (p. 163). Izd-vo AN SSSR.

11. **Author's field notes.** (2025). Field record No. 2; Shumanay District. Informant: Seregul Madiyarova (born in 1958).

12. **Author's field notes.** (2025). Field record No. 5; Kungrad District. Informant: Dilaram Mamutova (born in 1982).

THE CONCEPT AND THEORETICAL-LEGAL FOUNDATIONS, TYPES, AND FORMS OF PARTICIPATION IN CRIMINAL LAW

Bekmurodova Umida Abdusamad kizi,

Activities of the internal affairs bodies of the Shaykhantakhur district under the coordination department

Investigation Department, Analysis and Control Department,

senior investigator, major

email: nadinkaz.uz.@gmail.com

Phone: (97) 422-14-43

Annotation*: This thesis covers the concept of complicity in a crime, its characteristics, types and forms of complicity, objective and subjective signs of complicity, theories of liability for complicity, and liability for complicity in a crime. In addition, the legal provisions on the institution of participation existing in the criminal legislation and law enforcement practice of some foreign countries were studied.*

Key words: *Participation, simple participation, complex participation, accessory theory of participation, independent theory, objective sign, subjective sign, intent.*

INTRADUCTION

According to the Decree of the President of the Republic of Uzbekistan dated September 11, 2023, No. 158 "On the 'Uzbekistan-2030' Strategy," the goal of ensuring the rule of law and reforming the judicial system is defined as "ensuring the supremacy of the Constitution and laws, and making ensuring the reliable protection of human rights and freedoms the main criterion of judicial reforms" [1].

Crime as a social phenomenon poses a significant threat to humanity. Among such crimes, the most dangerous are crimes committed in complicity. The most common form in law enforcement practice is crimes committed by a group of persons. Undoubtedly, the social danger of crimes committed by a

group of persons is high, as a crime committed by a group of persons causes more damage to social relations than actions committed by a single person. In criminal law, when discussing the subject of a crime, the institution of participation is also considered, specifically the types of participants. Article 27 of the Criminal Code defines the concept of complicity in a crime. According to it, the joint participation of two or more persons in the commission of an intentional crime is recognized as complicity [2].

In the theory of criminal law, two theories have been formed that define liability for complicity in a crime. The first is the accessory theory of participation (from the Latin accessoriumm - additional, not independent), the second is the theory of independent responsibility. According to *the accessory theory of complicity*, the criminal liability of the organizer, accomplice, and accomplices does not have an independent basis [3]. The legal basis for their liability is the commission of a crime by the perpetrator. In this case, the organizer, accomplice, and assistants participate in the crime committed by the perpetrator, who is considered the primary culprit, and therefore their criminal activities do not acquire an independent character, but only have a secondary significance in relation to the perpetrator's criminal act.

Proponents of accessory theory agree that "if there is no primary crime, there can be no talk of complicity in the crime; that is, there is no complicity in a crime that does not exist in reality" [4]. They emphasize that when the act of the organizer, accomplice, or assistant in the commission of a crime does not constitute the primary crime, the issue of the liability of the organizer, accomplice, or assistant should be considered in relation to the liability of the perpetrator [5].

In the theory of modern criminal law, there are other opinions regarding the concept of the liability of participants in a crime, in particular, according to

the German scientist G. Frister, the liability of the witness and assistant among the participants in the crime is only accessory [6].

According to the theory of *independent liability of participants* in a crime, the criminal liability of each participant in a crime is of an independent nature, i.e., "a participant in a crime is responsible not for all crimes committed jointly, but only for the acts in which they participated, since each act of the participants, which determines the criminal consequence resulting from the unity of common forces, is of an independent nature, and there are independent grounds for their assessment" [7].

O.Y. Chinyakov writes: "In complicity committed in connection with the distribution of roles, each of them performs different actions; therefore, in such a case, there is no reason to establish a uniquely suitable general corpus delicti for the acts committed by them: in this case, each participant possesses 'its own corpus delicti'" [8]. In this case, the fact that the perpetrator is not held liable (for example, his voluntary return from the crime) does not exempt the other participants from criminal liability. Consequently, the liability of the participants in a crime arises not from the actions of the perpetrator, but from the socially dangerous acts committed by each participant individually.

The concept of complicity is given differently in the CIS countries, and a separate chapter is dedicated to this concept in the criminal legislation of Belarus, the Russian Federation, Tajikistan and other republics [9].

There are a number of specific features of crimes committed in complicity, and when qualifying a particular crime, it is necessary to pay attention not only to the complicity of the act, but also to the specific signs and forms of complicity based on the principles of legality and justice.

In particular, according to Article 28 of the Criminal Code of the Republic of Uzbekistan, a person who has committed a crime directly, in whole or in part, or using persons or other means that cannot be held liable in accordance with the

Criminal Code, is recognized as the perpetrator. It follows from this that in practice, in the aforementioned case, the person who committed the crime is held liable under the norm of the Special Part of the Criminal Code in the part providing for liability for the commission of a crime in complicity.

In our view, such a qualification of the act contradicts the principles of social justice and the principle of justice of the Criminal Code. Furthermore, in the criminal legislation of most CIS countries, the concept of complicity is defined as the joint participation of two or more sane individuals who have reached the age of the subject of the crime in the commission of an intentional crime. In this regard, it is advisable to amend the first part of Article 27 of the Criminal Code to read as follows:

"Participation is recognized as the joint participation of two or more sane individuals who have reached the age of the subject of the crime in the commission of an intentional crime."

Article 44 of the Criminal Code of the Republic of Moldova defines simple complicity as the joint commission of the objective side of a crime by two or more persons. That's what we think. The simple participation provided for in Article 29 of the Criminal Code of the Republic of Uzbekistan creates certain difficulties in the qualification of crimes. In practice, when qualifying crimes committed in complicity, it does not matter whether the act was committed in simple or complex complicity.

Although the theory of criminal law explains that a person who has committed an act not covered by the criminal intent of other participants is recognized as a participant in the excess, as well as that he himself is responsible for the act not covered by the criminal intent of other participants, this rule is not reflected in the Criminal Code of the Republic of Uzbekistan.

This norm is reflected in the Criminal Codes of some CIS countries, in particular, the Russian Federation (Article 36), Kazakhstan (Article 30),

Moldova (Article 48), Azerbaijan (Article 35), Georgia (Article 26), and Armenia (Article 40).

The crime committed through participation is interpreted in the complex of inevitable objective and subjective signs, revealing the content of the concept of "participation" that we gave above.

Objective features include: 1) the participation of two or more persons in the commission of a crime; 2) the joint action of group members in the commission of a crime. The participation of two or more persons in the commission of a crime through complicity is a numerically significant characteristic. This means that when a crime is committed in complicity, all participants must be persons who have reached the age of the crime and are of sound mind.

In most cases, group members involve minors in crimes committed in complicity. In such cases, members of an organized group are held criminally liable for involving a minor in a crime alongside the crimes they have committed. Furthermore, in crimes committed in complicity, the actions of the participants are also important.

In a crime committed in complicity, joint action is important. In a crime committed in complicity, each participant must fulfill their respective duties. That is, one organizes, one forms a group, another gathers information, another prepares for a crime, and the perpetrator commits this crime.

A subjective sign is the intentional commission of a crime by a participant; that is, the participants must have known in advance what harmful consequences could arise from their joint socially dangerous actions and, whether they wanted it or not, must have consciously permitted it. One of the participants may commit a crime with direct intent, while the other may commit it with indirect intent.

Participation is considered an intentional crime, in which the perpetrator consciously unites to achieve their criminal goal. Therefore, persons who are

mentally incompetent or have not reached a certain age cannot be participants in a crime.

There is no complicity in crimes committed through negligence.

Considering from the perspective of scholars that the forms of participation provided in legislation have taken on a different character in legal literature, V.I. Radchenko believes that there are two forms of participation: unagreed and pre-agreed [10]. Our legislation reflects the absence of prior conspiracy in only one case, namely simple participation; in all other cases, there is a prior agreement. Therefore, in this case, we cannot agree with this opinion, as it does not reflect interconnectedness and distinctive features.

In accordance with Part 2 of Article 29 of the Criminal Code, the participation of two or more persons in the commission of a crime without prior conspiracy is called simple complicity. The commission of a crime by a group of persons, defined as an aggravating circumstance in the relevant article of the norms of the Special Part of the Criminal Code, corresponds to this article. But although this is qualified from a practical point of view, there is no clear and detailed provision about it from a legislative point of view. For example, Rustambaev believes that the simple form of simple participation, since there is a task of roles between the participants, always requires joint performance" [11].

"The commission of a crime by several persons without mutual consent denies complicity in the crime; in simple complicity, the agreement is expressed in the process of committing the crime or in the participation of another person in the crime committed by one person" [12].

This situation, in turn, differs from complex participation in terms of prior conspiracy and non-conspiracy. In accordance with Part 3 of Article 29 of the Criminal Code, complicity is recognized as the participation of two or more persons in the commission of a crime by prior conspiracy. The commission of a crime by prior conspiracy by a group of persons, defined as an aggravating

circumstance in the relevant article of the norms of the Special Part of the Criminal Code, corresponds to this article. However, although this is qualified in practice, there is no clear and detailed provision regarding this from a legislative perspective. Despite the fact that several articles of the Criminal Code establish liability for committing a crime by a group of persons or by prior conspiracy of a group of persons, in most cases, insufficient attention is paid to this in investigative and judicial practice and among theoretical scholars, and no distinction is made between them.

LIST OF REFERENCES

1. Decree of the President of the Republic of Uzbekistan Sh. Mirziyoyev dated September 11, 2023, No. 158 "On the 'Uzbekistan-2030' Strategy," https://lex.uz/ru/docs/6600413

2. M. Usmonaliev. Criminal Law (General Part). – T. "Nasaf." 2010. P. 274.

3. Yesakov G. Qualification of joint commission of a crime with a person not subject to criminal liability: a new turn in judicial practice // Criminal Law. – 2011. - No 2. – P. 10-15; Yani P. Problems of Understanding Participation in Judicial Practice // Law. – 2013. - No 7. – P. 44-49.

4. Kovalev M.I. Involvement in a crime: Monograph. - Тошкент, 2020. – P. 18; Brilliantov A. Issues of Participation in the Qualification of Facilitating Terrorist Activity // Criminal Law. – 2008. – 3. No – P. 25–30; Panov M.I. Selected scientific works on the problems of jurisprudence / M.I. Panov. – C.: In Jura, 2010. - 812 p.

5. Giorgi Barabadze. For Understanding the Accessory Nature of Complicity / Justice and Law // Legal journal of judges association of Georgia. – 2010. – 1 (24). – p. 55; Bezborodov D.A. Principles of criminal liability for the joint commission of a crime // Criminalist. – 2013. 2 (13). No – P. 95.

6. Frister G. Criminal Law of Germany. General part / Trans. from German; 5th ed. – M.: Infotropik Media, 2013. – P. 514.

7. Kvasha O. Theories of complicity in a crime in criminal law and doctrine // Law and Life. – 2013. – No 8. – P. 23.

8. Chinyakov O.E. Organizer of crime: theories of accessory and independent responsibility // World of science and education. – 2015. - 4. No – 25.

9. Kovalev M. I. Participation in a Crime. – MOSCOW: INFRA-NORMA, 2012. P.56.

10. Criminal Law. General part: Textbook // General. Chast. V.I. Radchenko. – M., 2004. – P. 258.

11. Rustambaev M.Kh. Course of Criminal Law of the Republic of Uzbekistan. Volume 1. The doctrine of crime. Textbook. 2nd edition, supplemented and revised - T.: Military-Technical Institute of the National Guard of the Republic of Uzbekistan, 2018. P. 346.

12. Otajonov A.A. Improving liability for crimes committed in complicity: doctoral dissertation in legal sciences. - Тошкент, 2017. P. 87.

THE PRINCIPLE OF SOCIAL JUSTICE AND ITS SUBSTANCE IN THE CONSTITUTION OF NEW UZBEKISTAN

Xadjiyev Azizbek

Independent Researcher, National Human Rights Centre of the Republic of Uzbekistan

hodjievazizbek559@gamil.com

Abstract. *This thesis examines the substance of social justice in the Constitution of New Uzbekistan through doctrinal analysis of constitutional provisions, presidential statements and United Nations materials. It identifies three interrelated dimensions: equitable access to social benefits, protection of human dignity and equality of opportunity. The analysis distinguishes constitutional commitments from demonstrated policy outcomes and explains the importance of solidarity and inclusive citizenship. It concludes that social justice requires clear entitlements, fair administrative procedures and accountable implementation to translate constitutional guarantees into effective protection.*

Keywords: *social justice; Constitution of Uzbekistan; social state; human dignity; equality of opportunity; solidarity; social protection.*

INTRODUCTION

Social justice concerns both the distribution of social benefits and the conditions under which individuals can exercise their rights. In Uzbekistan, it provides a basis for examining the relationship between constitutional guarantees and public policy. In his address marking the twenty-fifth anniversary of the Constitution, President Shavkat Mirziyoyev associated social justice with legal equality, access to education and healthcare, freedom of employment and support for older people and citizens requiring social protection.[45] This formulation connects equality with concrete responsibilities of public

[45] Mirziyoyev, Sh. (2017). The Constitution as a firm foundation for a free and prosperous life and the further development of our country. Address marking the twenty-fifth anniversary of the Constitution. https://constitution.uz/oz/pages/prezident_maruzasi_25yil

institutions. The central question of this thesis is how these responsibilities can be understood as a coherent constitutional principle. It argues that social justice combines distribution, dignity and opportunity, while solidarity connects individual guarantees with collective responsibilities. Constitutional recognition establishes a normative foundation; whether institutions fulfil that foundation requires separate evaluation.

METHODOLOGY

The study uses doctrinal legal analysis and systematic interpretation of the Constitution alongside the policy and scholarly materials cited below. Constitutional provisions are treated as legal norms, presidential statements as expressions of policy priorities, and United Nations materials as conceptual reference points. The analysis organises the sources around distribution, dignity and opportunity. It does not measure policy outcomes or establish causal relationships between constitutional reform and socioeconomic change.

RESULTS

The constitutional framework links social justice to several complementary principles. Article 1 characterises Uzbekistan as a social state. Article 8 defines the people through citizenship irrespective of nationality. In its revised wording, Article 14 places legality, social justice and solidarity together as foundations of state activity directed towards human well-being and sustainable social development.[46] Read together, these provisions support an interpretation of social justice that combines inclusive membership with responsibility for the conditions of social life. The first dimension is distributive. The United Nations report Social Justice in an Open World examines social justice through the distribution of income, assets and opportunities, connecting

[46] Constitution of the Republic of Uzbekistan, revised text (2023), Articles 1, 8 and 14. https://constitution.uz/en/clause/index

distribution with human rights and development.[47] For the present analysis, this perspective suggests that evaluating a social programme requires attention to who can actually obtain its benefits. A formally available service may remain inaccessible because of cost, distance or administrative barriers. Fair distribution therefore concerns the design of access as well as the allocation of resources. The second dimension is dignity. Akmal Saidov's account of the revised Constitution associates human dignity with security, fundamental rights, healthcare, education, targeted social protection and a healthy environment.[48] This connection makes the treatment of beneficiaries relevant to the assessment of social policy. Assistance should be administered through clear rules and respectful procedures. In the interpretation advanced here, a dignity-based approach regards recipients as holders of rights whose circumstances must be considered, rather than as passive beneficiaries of discretionary support. The third dimension is equality of opportunity. In his address to the 150th Assembly of the Inter-Parliamentary Union, President Mirziyoyev cited an estimate that equal economic participation by women could increase global GDP by 26 per cent. He also noted an increase in women's parliamentary representation from 11.3 per cent in 1995 to 27.2 per cent at the time of that address.[49] These figures are statements reported in the speech, not findings generated by this study. Their relevance is illustrative: opportunity includes participation in economic activity and public decision-making. Its constitutional value does not depend solely on a projected economic return.

[47] United Nations, Department of Economic and Social Affairs. (2006). Social Justice in an Open World: The Role of the United Nations (ST/ESA/305), pp. 13–16. New York: United Nations. https://desapublications.un.org/file/870/download

[48] Saidov, A. Kh. (n.d.). The revised Constitution as a firm guarantee of human honour, dignity and rights. https://constitution.uz/uz/pages/Konstitutsiya_mustahkam_kafolat

[49] Mirziyoyev, Sh. (2025). Address to the 150th Assembly of the Inter-Parliamentary Union. https://president.uz/uz/lists/view/8034

DISCUSSION

The three dimensions should be considered together. Social assistance may address an immediate shortage while leaving barriers to education or employment unchanged. Equally, formally identical eligibility rules can disadvantage applicants whose circumstances differ substantially. The argument developed here is that justified differentiation can serve equality when it addresses identifiable needs through transparent criteria. Such differentiation must remain open to scrutiny so that targeted support does not become arbitrary preferential treatment. Inclusive citizenship provides a further connection between social justice and solidarity. The Presidential Decree of 15 November 2019 approving the Concept of State Policy in the Field of Interethnic Relations establishes a policy framework for interethnic relations.[50] Considered alongside Article 8, this framework supports attention to inclusion across communities. A practical implication is that the accessibility of public services should be assessed from the perspective of different users, including those encountering language barriers.

The United Nations' World Day of Social Justice materials connect social justice with decent work, social protection, gender equality and inclusion.[51] This broader perspective cautions against reducing social justice to monetary transfers alone. The interpretation proposed in this thesis consequently joins material support with access to institutions and opportunities for participation. These elements are mutually supportive: protection against hardship can enable participation, while participation allows affected groups to communicate needs that administrative rules might otherwise overlook.

[50] President of the Republic of Uzbekistan. (2019, November 15). On approving the Concept of State Policy of the Republic of Uzbekistan in the Field of Interethnic Relations (Decree No. PF-5876). National Database of Legislation. https://lex.uz

[51] United Nations. (n.d.). World Day of Social Justice, 20 February. https://www.un.org/en/observances/social-justice-day

To make this interpretation operational, the thesis proposes three questions for assessing social measures. Are eligibility requirements understandable and publicly accessible? Can intended beneficiaries use the relevant service in practice? Can an adverse decision be explained and challenged? These questions translate the conceptual framework into criteria for subsequent institutional research. They are analytical proposals, not empirical findings.

CONCLUSION

Social justice in the Constitution of New Uzbekistan combines equitable distribution, human dignity and equal opportunity, guided by solidarity and inclusive citizenship. Its key implication is that constitutional commitments require clear rights, accessible procedures and accountable decisions. Future research should assess whether these guarantees work effectively in practice, especially for disadvantaged groups.

REFERENCES

1. *Constitution of the Republic of Uzbekistan*. (2023). https://constitution.uz/en/clause/index

2. Mirziyoyev, S. (2017). *The Constitution as a firm foundation for a free and prosperous life and the further development of our country* [Speech]. https://constitution.uz/oz/pages/prezident_maruzasi_25yil

3. Mirziyoyev, S. (2025). *Address to the 150th Assembly of the Inter-Parliamentary Union* [Speech]. https://president.uz/uz/lists/view/8034

4. President of the Republic of Uzbekistan. (2019, November 15). *On approving the Concept of State Policy of the Republic of Uzbekistan in the Field of Interethnic Relations* (Decree No. PF-5876). National Database of Legislation. https://lex.uz

5. Saidov, A. K. (n.d.). *The revised Constitution as a firm guarantee of human honour, dignity and rights*. https://constitution.uz/uz/pages/Konstitutsiya_mustahkam_kafolat

QADIMGI SO'G'D VA BAQTRIYADA AYOLLARNING MAVQEI: ARXEOLOGIK MANBALAR ASOSIDA

Mohichehra G‘ulomova

Buxoro Davlat Universiteti 2-kurs magistri

Annotatsiya. *Qadimgi So‘g‘d va Baqtriyada ayol obrazini faqat oilaviy munosabatlar doirasida talqin qilish uning xo‘jalik, marosim va ijtimoiy mavqeini to‘liq ochib bermaydi. Tezisning maqsadi arxeologik dalillar orqali ayollarning jamiyatdagi funksiyalarini qayta tavsiflashdan iborat. Dafn majmualari, tasviriy yodgorliklar va epigrafik belgilar tarixiy-qiyosiy tahlil, hermenevtika hamda manbashunoslik usullari asosida uch guruhga ajratilib o‘rganildi. Tahlil uch yo‘nalishni — dafn marosimidagi mavqe, xo‘jalik faoliyatidagi ishtirok va diniy-tasviriy timsollarni — ajratib ko‘rsatdi. So‘g‘d va Baqtriya materiallarida ayollar mavqei ikki xil qatlamda namoyon bo‘ladi: umumiy marosimiy qadriyatlar hamda hududiy ijtimoiy farqlar. Dafn buyumlari va tasviriy belgilar ayolning nasl davomiyligi bilan bir qatorda mulkiy, hunarmandchilik va marosimiy vakolatlar bilan ham bog‘langanini ko‘rsatadi. Epigrafik dalillar bu talqinni ijtimoiy rol va diniy nufuz masalalari bilan to‘ldiradi. Natijada ayollar mavqeini faqat patriarxal oila modeli bilan izohlash cheklangan yondashuv ekani asoslandi. Yangi xulosa sifatida arxeologik manbalarni uchlik tasnif orqali birgalikda o‘qish taklif etiladi; keyingi tadqiqotlarda topilmalar xronologiyasi va hududiy tipologiyasi chuqurlashtirilishi lozim.*

Kalit so‘zlar: *arxeologik manbalar, ayollar ijtimoiy mavqei, Baqtriya jamiyati, dafn marosimlari, manbashunoslik, So‘g‘d madaniyati*

Аннотация. *Сведение женского образа в древней Согдиане и Бактрии к семейной сфере не объясняет его хозяйственные, обрядовые и социальные функции. Цель тезиса — заново определить положение женщин на основе археологических свидетельств. Погребальные комплексы, изобразительные памятники и эпиграфические знаки были разделены на три группы и рассмотрены посредством историко-сравнительного анализа, герменевтики и источниковедческого подхода. Анализ выявил три взаимосвязанных направления: статус женщины в погребальном обряде, участие в хозяйственной деятельности и значение женских образов в*

религиозной визуальной культуре. Материалы Согдианы и Бактрии показывают сочетание двух уровней: общих ритуальных представлений и региональных социальных различий. Погребальный инвентарь и изображения связывают женщину не только с продолжением рода, но также с имущественными, ремесленными и обрядовыми полномочиями. Эпиграфические данные уточняют её социальную роль и религиозный авторитет. Поэтому объяснение женского положения исключительно патриархальной семейной моделью оказывается недостаточным. Предлагается совместное чтение трёх групп источников; дальнейшие исследования должны уточнить хронологию находок и региональную типологию.

Ключевые слова: *археологические источники, источниковедение, культура Согдианы, общество Бактрии, погребальные обряды, социальное положение женщин*

Abstract. *Reducing the position of women in ancient Sogdiana and Bactria to the family sphere obscures their economic, ritual, and social functions. This thesis reconsiders women's status through archaeological evidence. Burial complexes, visual monuments, and epigraphic signs were divided into three groups and examined through historical-comparative analysis, hermeneutics, and source criticism. The analysis distinguished three connected dimensions: women's status in burial practice, participation in economic activity, and the meaning of female figures within religious visual culture. Evidence from Sogdiana and Bactria combines two levels: shared ritual ideas and regional social differences. Burial goods and visual representations associate women not only with lineage continuity but also with property, craft, and ritual authority. Epigraphic evidence further clarifies social roles and religious prestige. Thus, interpreting women's position solely through a patriarchal family model is inadequate. The thesis proposes reading the three source groups together; future research should refine the chronology of finds and regional typology.*

Keywords: *archaeological sources, Bactrian society, burial practices, social position of women, Sogdian culture, source criticism*

KIRISH

Qadimgi So‘g‘d va Baqtriyada ayollarning mavqei arxeologik manbalarda oilaviy doiradan kengroq ijtimoiy, xo‘jalik va marosimiy faoliyatlar bilan bog‘lanadi [1]. Tasviriy yodgorliklar hamda dafn majmualari ushbu mavqeni

tarixiy geografiya va tarixiy sinxronizm asosida qiyoslash zarurligini ko‘rsatadi [2].

Mazkur ishda Qadimgi So‘g‘d va Baqtriya arxeologik materiallari o‘rganilib, diqqat markazida ayollarning mavqeini ifodalovchi tarixiy manba xususiyatlari turadi. Tadqiqot maqsadi ikki hududdagi ayollar mavqeining xo‘jalik, oilaviy-ijtimoiy va marosimiy ko‘rinishlarini aniqlashdan iborat. Vazifalar: 1) dafn, tasviriy va epigrafik dalillarni tasniflash; 2) manba tanqidi orqali ularning mazmunini sharhlash; 3) hududiy farqlarni tarixiy-qiyosiy tahlil qilish. Manbashunoslik, arxeologik tipologiya va hermenevtik yondashuvlar birlamchi dalillarni izchil talqin qilishga xizmat qiladi [3]. Shu asosda keyingi tahlilda uch manba guruhi o‘zaro qiyoslanadi [4].

Keyingi tahlilda tarixiy-qiyosiy usul Qadimgi So‘g‘d va Baqtriya materiallarini tarixiy geografiya doirasida qiyoslashga yo‘naltiriladi. Manba tanqidi, epigrafik tahlil va arxeologik tipologiya ayollar mavqeining xo‘jalik hamda marosimiy belgilarini ajratishga imkon beradi [5]. Tasviriy yodgorliklar talqini diniy qarashlar bilan bog‘liq holda tekshiriladi [6].

TADQIQOT NATIJALARI VA TAHLILI

Oldingi bo‘limda belgilangan tarixiy-qiyosiy tahlil mezonlari asosida arxeologik manbalar uch guruhga ajratildi: dafn majmualari, ayol obrazlari aks etgan tasviriy yodgorliklar va epigrafik dalillar. Dafn marosimlari Qadimgi So‘g‘dda ayollarning oilaviy mavqei bilan birga xo‘jalik faoliyatiga daxldor buyumlar orqali namoyon bo‘lganini ko‘rsatadi; Baqtriya qabrlari esa bezaklar, idishlar va marosimiy ashyolar uyg‘unligi bilan farqlanadi [1]. Ushbu tafovut ayollarning mavqeini yagona qolipda emas, tarixiy geografiya va mahalliy marosim an’analari kesishmasida talqin qilish zarurligini bildiradi.

Tasviriy yodgorliklar qiyosi ijtimoiy mavqening marosimiy ko‘rinishini aniqlashtiradi. Jartepa II devoriy suratlarida ayol obrazlarining kiyim, bezak va marosimiy makon bilan birgalikda berilishi ularning diniy tasavvurlardagi faol

ramziy o‘rnini anglatadi [2]. Baqtriya materiallarida ayol tasvirlari ko‘proq bezaklar va marosimiy atributlar bilan bog‘langanligi qayd etilib, bu holat oilaviy-ijtimoiy mavqe bilan diniy vazifaning tutashganini ko‘rsatadi [3].

1-jadval.

Qadimgi So'g'd va Baqtriya arxeologik manbalarining mazmuniy qiyosi

Mezon	**Qadimgi So'g'd**	**Baqtriya**
Dafn dalillari	Bezaklar va xo‘jalik buyumlari	Bezaklar va marosimiy ashyolar
Tasviriy dalillar	Marosimiy kiyim va ijtimoiy ramzlar	Bezak va diniy atributlar
Epigrafik dalillar	Qarindoshlik hamda mansublik belgilari	Shaxsiy maqom va marosimiy aloqalar

Manba: muallif tomonidan tuzilgan

1-jadvaldagi qiyos ayollarning mavqei uch yo‘nalishda — xo‘jalik, oilaviy-ijtimoiy va marosimiy faoliyatda — turlicha ifodalanganini ko‘rsatadi. Epigrafik tahlil bu xulosani shaxs nomlari, qarindoshlik munosabatlari va mansublik belgilarining qayd etilishi orqali mustahkamlaydi; So‘g‘diy genealogik an’analar ayollarning ijtimoiy aloqalar tizimidagi o‘rnini cheklangan oilaviy doiradan kengroq ko‘rsatadi [7]. Shu sababli dafn va tasviriy manbalarda bilvosita aks etgan mavqe epigrafik dalillarda ijtimoiy munosabatlar tili orqali aniqlashadi [8].

Manba tanqidi nuqtayi nazaridan, arxeologik buyumning marosimiy vazifasi uning xo‘jalik ahamiyatini inkor etmaydi; aksincha, ikki vazifa ayollarning mavqeini birgalikda belgilagan. Epigrafik dalillarni tasviriy va dafn materiallari bilan qiyoslash gipotezani tasdiqlaydi, chunki ayollar faoliyati uchala manba guruhida ham turli shaklda qayd etilgan [4]. Mazkur dalillar majmuasi xulosada Qadimgi So'g'd va Baqtriya o‘rtasidagi umumiylik hamda hududiy farqlarni birgalikda umumlashtirish uchun asos yaratadi.

XULOSA

Dafn, tasviriy va epigrafik dalillarni tarixiy-qiyosiy tahlil qilish Qadimgi So‘g‘d va Baqtriyada ayollarning mavqei yagona qolipda emasligini, xo‘jalik, oilaviy-ijtimoiy hamda marosimiy vazifalar kesishmasida shakllanganini aniqlashtirdi. Tarixiy sinxronizm va davrlashtirish yondashuvi mazkur mavqening hududiy farqlar bilan birga qadimgi jamiyat tuzilmasida uzluksiz namoyon bo‘lganini asoslaydi. Ushbu ilmiy hissa arxeologik manbalarni manba tanqidi, tarixiy-qiyosiy usul va epigrafik tahlil orqali yagona talqin doirasida birlashtirishda ko‘rinadi. Milliy istiqbolda milliy arxivlar (O‘zMA, MDMA) hamda viloyat davlat arxivlaridagi arxiv hujjatlarini tarixiy geografiya, sfragistika va etnografik kuzatuv materiallari bilan qiyoslash maqsadga muvofiqdir.

ADABIYOTLAR RO‘YXATI

1. Литвинский Б.А. Женщина в древней Бактрии // Советская археология. — 1981. — № 2. — С. 35–49.

2. Marshak B.I., Raspopova V.I. Wall paintings from the Temple of the Jartepa II settlement // Bulletin of the Asia Institute. — 1997. — Vol. 11. — P. 1–20.

3. Пугаченкова Г.А. Древняя Бактрия: проблемы истории и культуры // Вестник древней истории. — 1982. — № 3. — С. 45–61.

4. Grenet F. Zoroastrianism in Central Asia // The Wiley Blackwell Companion to Zoroastrianism. — 2015. — P. 129–146.

5. Grenet F. Regionalism and nomadism in the Sogdian world: a reconsideration // Ērān ud Anērān: Studies Presented to Boris I. Marshak on the Occasion of His 70th Birthday. — 2003. — P. 103–114.

6. Rose J. Zoroastrianism: An Introduction. — London: I.B. Tauris, 2011. — 256 p.

7. Lerner J.D. Aspects of the Genealogy of the Sogdians // Bulletin of the Asia Institute. — 2003. — Vol. 13. — P. 139–154.

8. Raspopova V.I. Sogdians and their culture // Silk Road Studies. — 2007. — Vol. 10. — P. 35–52.

9. Назаров Р.Р. Корейская диаспора Узбекистана: история и современность // Известия Восточного института. — 2022. — № 2. — С. 73–84. — DOI: 10.24866/2542-1611/2022-2/73-84.

10. Almardanov I., Boyto‘rayev S. O‘zbekiston davlati va huquqi tarixi tarixiy-huquqiy fan // AIJMR. — 2023. — URL: https://inlibrary.uz/index.php/aijmr/article/view/63403 (murojaat sanasi: 08.03.2025).

UDC 398.4:39(=512.161+512.122)

SHAMANISM AMONG TURKIC PEOPLES: KARAKALPAK PORKHANSHIP

Gulshana Muratbayevna Khozhaniyazova

Doctor of Philosophy (PhD) in Historical Sciences, University of Innovative Technologies (28 Takiatash Street, Khodjeyli District, Karakalpakstan, 230100, Uzbekistan)

gulshanx@internet.ru

https://orcid.org/0009-0006-0732-507X

Abstract: *This article analyzes the historical roots of Karakalpak porkhanship, its connections with Turkic bakhshi traditions, and the processes of its integration with Islamic religious beliefs and practices. Porkhanship is examined as an ethno-cultural phenomenon formed on the basis of the convergence of ancient shamanistic views, traditional folk healing, and Islamic beliefs. Additionally, the socio-cultural functions of the porkhan in Karakalpak society, the practice of healing through zikir (dhikr), and the significance of the kobyz as a sacred musical instrument are evaluated.*

Keywords: *porkhanship, bakhshi tradition, Karakalpaks, kobyz, religious syncretism, Turkic peoples, ethno-cultural heritage.*

INTRODUCTION

Bakhshanship (the tradition of kam or shamanism) held an important place in the worldview, mythology, and ritual system of Turkic peoples in the pre-Islamic era. Certain elements of this system were later preserved within the culture and popular beliefs of Central Asian peoples, including the Karakalpaks. From this perspective, Karakalpak porkhanship is evaluated as a complex cultural phenomenon formed as a result of the mutual integration of ancient bakhshi views, traditional folk healing customs, and Islamic concepts. In the practice of porkhanship, sacred perceptions of natural forces, belief in the spirits

of ancestors, and rituals aimed at eliminating diseases and various obstacles encountered in human life through spiritual influence played a significant role. In this process, the porkhan served as a mediator regulating the relationship between humans and supernatural forces.

MAIN PART

In studies dedicated to the phenomenon of bakhshanship, its meaning is explained in various ways. Specifically, the Romanian scholar Mircea Eliade theoretically substantiated bakhshanship as a universal religious phenomenon, describing it as an "archaic technique of ecstasy." The scholar notes that bakhshanship is not a local phenomenon within the scope of a specific people or region; rather, it is one of the distinct forms of humanity's religious experience [2]. However, while this perspective reveals the religious and psychological aspects of shamanism, it pays less attention to its social functions.

From this point of view, the views of S. M. Shirokogoroff are of particular importance. He evaluates shamanism as a social institution that regulates relations between human communities and the world of spirits [9]. This approach occupies an important place in analyzing Karakalpak porkhanship, because porkhans served not only as individuals performing religious rituals, but also as traditional specialists participating in solving socio-psychological problems within the community.

The issue of shamanism among Turkic peoples is also widely covered in the fundamental studies of Abdülkadir İnan. The scholar analyzed the history of shamanism, the institution of the kam, its rituals, and shamanistic elements preserved after the process of islamization [3]. Furthermore, Yaşar Kalafat notes that shamanic views occupy an important place in the religious beliefs of Turkic peoples, and some of their elements remained preserved within folk beliefs even after the adoption of Islam [4]. Nevertheless, in modern research, this

phenomenon is viewed less as a "survival of shamanism" and more as a result of religious syncretism.

In the contemporary lifestyle of Central Asian peoples, shamanism is manifested not as an independent religion, but as a collection of cultural and religious practices associated with Islam, folk healing, spirits, and sacred places (saints). Its revival is closely linked to post-Soviet transformation, health issues, and spiritual quests. In their works, researchers M. Kikimbayev, R. Kamarova, and Z. Malgarayeva note that rituals characteristic of shamanism, concepts related to spirits, and nature cults are being re-evaluated within the framework of neo-Tengrism. These elements are adapting to modern social conditions and being presented as a national cultural heritage [5:184-201]. In the studies of Zh. Mamatov, the traces left by shamanism and magical concepts, as well as how the practice of bakhshanship coexists syncretically with the religion of Islam, are systematically analyzed [7].

In the explanatory dictionary of the Karakalpak language, the word "porkhan" is explained as a diviner, a person who performs *zikir* and heals the sick [8, 193]. Data regarding the practice of healing through *zikir* among Karakalpaks can also be found in the studies of Yu. V. Knorozov. This data shows that porkhanship retained a certain significance in people's lives even in the 20th century [6:9-96]. The kobyz occupies a special place in the practice of porkhanship. In the tradition of Turkic peoples, the kobyz was regarded not merely as a musical instrument, but also as a sacred tool of profound significance. In some cases, its sound was understood as a means for communicating with spirits, entering a trance state, and ensuring the success of a ritual. From this perspective, the phenomenon of the kobyz in Karakalpak porkhanship manifests as one of the important cultural markers of the shamanic heritage.

In almost all Turkic-speaking peoples, the root of the concept of the kobyz is the same: given as "kobyz", "khomus", "kobus", "kamus", "key-kobuz". The word "kobyz" contains the meaning of "khay", meaning to chant in a wailing manner—that is, *khay*, *khay-khaylayu*, performing—while "khay" in some Turkic peoples means performing by scraping the throat. The Kazakh and Uzbek kobyz are close to the Karakalpak kobyz. The head, two tuning pegs, curved neck, soundboard covered with leather at the lower part, horsehair strings, bridge, and bow of the kobyz are identical. The sound is produced by the friction between the strings and the bow [1:99-100].

CONCLUSION

In conclusion, Karakalpak porkhanship is not a direct continuation of Turkic shamanism; rather, it is a distinctive ethno-cultural phenomenon formed as a result of the long-term historical mutual adaptation (syncretism) of ancient shamanic beliefs, local folk healing, and Islamic religious worldviews. Such a conclusion allows for a more comprehensive disclosure of the historical and cultural significance and stages of transformation of this phenomenon.

REFERENCES

1. Bahadirova, S. (2017). *Qaraqalpaq qanday xalıq*. “Nawrız” baspası, 99-100
2. Eliade, M. (1964). *Shamanism: Archaic Techniques of Ecstasy*. Princeton University Press.
3. İnan, A. (1986). *Tarihte ve Bugün Şamanizm: Materyaller ve Araştırmalar* (3rd ed.). Türk Tarih Kurumu Basımevi.
4. Kalafat, Y. (2004). *Altaylardan Anadolu'ya Kamizm-Şamanizm*. Yeditepe Yayınları.
5. Kikimbayev, M., Kamarova, R., & Malgaraeva, Z. (2022). Neo-Tengrism in Kazakhstan as a Response to Re-Islamization. *Bulletin of L. N. Gumilyov Eurasian National University*, 141(4), 184–201.
6. Knorozov, Yu. V. (1994). Shamanskiy zikR v podzemel'ye Mazlumkhan-sulu. *Etnograficheskoye Obozreniye*, 6, 91–96.
7. Mamatov, J. (2023). Symbolic Signs of Spiritual Culture. *Asian Journal of Multidimensional Research*, 12(5).
8. *Qaraqalpaq tilinıń túsindirme sózligi*. (2023). Nókis.
9. Shirokogoroff, S. M. (1999). *The Siberian Shamanism*. Routledge.

UDC 631.58(=512.121)(575.1)

TRADITIONAL FARMING OF THE KARAKALPAKS IN THE AMU DARYA DELTA (19TH–20TH CENTURIES)

Eshmuratova M. O.

Doctoral Candidate, Faculty of History, Karakalpak State University (1 Akademik Ch. Abdirov St., Nukus, Karakalpakstan, 230112, Uzbekistan)

https://orcid.org/0009-0005-7796-4873

merajeshmuratova@gmail.com

Abstract: *This article examines the traditional farming system of the Karakalpaks and its adaptation to the natural and economic conditions of the Amu Darya delta. It analyzes various farming types, including irrigated, moisture-retaining (yzgar), estuary-floodplain (liman-qayir), and floodplain (qayir) agriculture, as well as methods for maintaining soil fertility and the local specificities of crop structure. The study determines that traditional farming was a multi-variant agrarian system based on the efficient utilization of natural resources.*

Keywords: *Karakalpaks, traditional farming, Amu Darya, moisture-retaining agriculture, floodplain agriculture, irrigated agriculture, natural environment.*

INTRODUCTION

The traditional agriculture of the Karakalpaks was a multi-faceted economic system adapted to the natural-geographical and hydrological conditions of the Amu Darya delta. Water resources, soil characteristics, climate, and the natural state of the land were of great importance in its formation. The article examines the Karakalpak types of irrigated, moisture-retentive, estuary-floodplain, and floodplain farming, as well as methods for maintaining soil fertility and establishing crop structure.

Moisture-retentive lands and riverside areas were a supplementary branch of the agricultural economy. The works of mid-19th-century authors provide interesting accounts of farming along the riverbanks: “These low plains are flooded every year when the Amu Darya overflows. As the water receded, the Karakalpaks would cultivate the moist soil, primarily planting melons, millet, and barley on it” [2,46].

MAIN PART

This practice was directly linked to the river's natural hydrological regime. In recent times, due to the decrease in the Amu Darya's water levels, the reduction of floods, and the intensification of droughts, the practical significance of moisture-based farming has diminished. The unique characteristic of this type of farming was its lack of complete dependence on artificial irrigation. In this practice, farmers engaged in agriculture by utilizing the natural moisture retained in the soil after the seasonal floods and subsequent retreat of the Amu Darya River.

Therefore, moisture-based farming can be evaluated not merely as an extensive economic form adapted to the natural hydrological cycle, but rather as a form of agroecological adaptation that emerged from the interplay between the river's seasonal water regime and human activity.

In the agricultural regions of Central Asian countries, a traditional method for increasing soil fertility involves releasing cattle into the fields for autumn grazing after the harvest. The weight of the cattle and their manure were considered to provide fertilizer, thereby increasing soil fertility. Another effective method for fertilizing the soil was to use silt rich in organic compounds, which accumulated in irrigation systems. The beneficial properties of silt were highly valued. Muddy river water contains various elements beneficial to plants; these elements helped increase soil fertility, and the silt caused the soil layer to thicken[3, 42-

46]. During dry seasons, it helps retain moisture in the fields, provides warmth during sudden cold spells, and the compost used for seeds was very beneficial when water was scarce [*Field materials of the author, 2026*]

The people of the Aral region engaged in both irrigated and non-irrigated forms of agriculture. These were divided as follows:

1. ***Irrigated agriculture:*** Systematically carried out using main and secondary canals.

2. ***Estuary-floodplain agriculture (Liman-qayir):*** This was an auxiliary farming sector for pastoralists, common in the areas flooded by the major branches of the Amu Darya.

3. ***Rain-fed agriculture (Qayir):*** Widespread on the Ustyurt Plateau and in the Kyzylkum Desert, this type of farming took place in low-lying areas that collected winter snowmelt and spring rains. Kazakhs and Karakalpaks planted millet, which has a short growing season, in these lands and obtained abundant and ecologically pure yields. For example, melons and pumpkins grown through this method could be stored until the following summer without any special storage facilities and were rich in vitamins and microelements [*Field materials of the author, 2024*]

In the Amu Darya department, floodplain agriculture occupied 2% of the total cultivated area. In the Tallik district, floodplain farming covered 893.5 desyatinas of land, which constituted 70% of the non-irrigated agriculture in the district. This comprised 1/10 of the total cultivated area in the district [1, 85].

Thus, a comparison of the data in the table shows that the crop structure in the Shorakhan and Shimbay sections was not the same. In Shorakhan, the share of cotton was 28.3%, which, together with winter wheat (23.2%), alfalfa (20.0%), and sorghum (11.6%), accounted for 83% of the sown area. In Shimbay, however, winter wheat (28.5%) and sorghum (18.2%) were predominant, while the share of cotton dropped to 13.5%. It is insufficient to

explain these differences solely by ethnic particularities. The formation of the crop structure was likely influenced by an interplay of factors, including the availability of water resources, the degree of soil salinity, the agro-climatic characteristics of the land, and the production orientation of the farms. From the table, we can observe that traditional agriculture among the Karakalpaks was not a uniform system, but rather a multi-variant one adapted to local natural and economic conditions.

By the beginning of the 20th century, five natural-economic districts had emerged within the Amu Darya department: Dauqara, Shimbay, Tallik, Shorakhan, and Qizilqum. The Dauqara district encompassed the eastern part of the Amu Darya delta, the middle and lower reaches of the Quwanish-jarma, and its branches: Bayis, Purkhan, Kok-ozek, Yani-suw, Naupir, and Ishim. As early as the beginning of the 20th century, the Quwanish-jarma had low water levels, and its aforementioned branches would become completely dry by the end of the summer months. A large part of the population in this area was forced to cease practicing agriculture due to water shortages [1].

CONCLUSION

In conclusion, it has been determined that the traditional agriculture of the Karakalpaks was a multi-faceted agrarian system adapted to the natural-geographical conditions of the Amu Darya delta. Its foundation was comprised of water regulation, the reclamation of saline lands, the preservation of soil fertility, and the selection of crop structures according to local conditions.

In traditional agriculture, methods such as irrigation, the use of moist and floodplain lands, soil leaching, and the application of organic fertilizers were interconnected. These practices demonstrate the degree of the farmers' adaptation to their natural environment.

Therefore, the traditional agriculture of the Karakalpaks, in conjunction with ethnic traditions, was formed as a multi-variant agrarian system adapted to local natural and economic conditions.

REFERENCES

1. Ballieva, R. (2022). *Karakalpakskiy etnos i traditsionnoe prirodopolzovanie* [The Karakalpak ethnic group and traditional environmental management]. Tashkent: Lesson Press.

2. Baziner, T. F. (1873). Puteshestvie cherez kirgizskie stepi v Khivu v 1842–1843 gg. [Journey through the Kirghiz steppes to Khiva in 1842–1843]. *Turkestanskie vedomosti*, (31), 46.

3. Yunusova, Kh. E., & Usarov, U. A. (2018). Nekotorye suzhdeniya ob istorii zemledelcheskoy kultury v Sredney Azii [Some considerations on the history of agricultural culture in Central Asia]. *Nauka, tekhnika i obrazovanie*, 42–46.

4. *Field materials of the author: No. 63*. Pirnazarov, B. (2026). Nukus, Uzbekistan.

5. *Field materials of the author: No. 42*. Paluanov, R. (2024). Karauzyak District, Uzbekistan.

ПРОБЛЕМЫ РАЗРЕШЕНИЯ ИНДИВИДУАЛЬНЫХ ТРУДОВЫХ СПОРОВ В РЕСПУБЛИКЕ УЗБЕКИСТАН

Сардор Дилшодович Гиясов

магистр, Правоохранительная академия Республики Узбекистан; старший юрисконсульт, Служба охраны при Главном управлении внутренних дел города Ташкента Министерства внутренних дел Республики Узбекистан

sardorgiyasov2112@gmail.com

Аннотация. *В статье исследуются основные проблемы разрешения индивидуальных трудовых споров в Республике Узбекистан. Анализируются действующие внесудебные, судебные и примирительные механизмы разрешения трудовых споров, а также вопросы оперативности рассмотрения, использования электронных доказательств и фактического исполнения решений. На основе анализа законодательства обосновываются направления совершенствования механизма разрешения индивидуальных трудовых споров, ориентированные на своевременное и эффективное восстановление нарушенных трудовых прав работников.*

Abstract. *The article examines the key issues surrounding the resolution of individual labor disputes in the Republic of Uzbekistan. It analyzes existing extrajudicial, judicial, and conciliation mechanisms for resolving labor disputes, as well as matters concerning the speed of proceedings, the use of electronic evidence, and the actual enforcement of decisions. Based on an analysis of the legislation, the article proposes ways to improve the mechanism for resolving individual labor disputes, aiming to ensure the timely and effective restoration of employees' violated labor rights.*

Ключевые слова: *индивидуальный трудовой спор, трудовые права, защита трудовых прав, восстановление трудовых прав, трудовое законодательство, медиация, судебная защита.*

Keywords: *individual labor dispute, labor rights, protection of labor rights, restoration of labor rights, labor legislation, mediation, judicial protection.*

ВВЕДЕНИЕ

В условиях развития социально ориентированного правового государства обеспечение и защита трудовых прав человека приобретают особое значение. Конституция Республики Узбекистан закрепляет право каждого на достойный труд, свободный выбор профессии и рода деятельности, благоприятные и безопасные условия труда, а также справедливое вознаграждение за труд без дискриминации. При этом каждому гарантируется судебная защита нарушенных прав и свобод. Важное место в системе гарантий трудовых прав занимает механизм разрешения индивидуальных трудовых споров, посредством которого обеспечивается разрешение разногласий между работником и работодателем и восстановление нарушенных прав (Mamasiddikov et al., 2024).

Актуальность исследования обусловлена тем, что законодательное закрепление трудовых прав само по себе не обеспечивает их эффективной реализации и восстановления в случае нарушения. Возникновение трудового спора свидетельствует о наличии разногласий между сторонами трудовых отношений, в связи с чем особое значение приобретают доступность и оперативность процедур его разрешения, эффективность судебной защиты, оценка доказательств и возможность фактического восстановления нарушенного права (Khamzina et al., 2021; Oliinyk, 2022). Работнику при этом гарантируется право на защиту своих трудовых прав, свобод и законных интересов всеми не запрещенными законом способами.

Целью настоящего исследования является выявление основных проблем разрешения индивидуальных трудовых споров в Республике Узбекистан и разработка предложений по совершенствованию соответствующего правового механизма.

В процессе исследования применялись **формально-юридический, системный и аналитический методы**, позволившие исследовать положения трудового законодательства и определить основные проблемы разрешения трудовых споров и восстановления нарушенных трудовых прав.

ОСНОВНАЯ ЧАСТЬ

Защита трудовых прав работников представляет собой систему правовых средств, направленных на предупреждение и пресечение нарушений, восстановление нарушенных прав, возмещение причиненного вреда и привлечение виновных лиц к ответственности. Согласно статье 527 Трудового кодекса Республики Узбекистан, защита трудовых прав включает восстановление нарушенного права, возмещение материального ущерба и компенсацию морального вреда (Raximov, 2020).

В этой системе особое место занимают индивидуальные трудовые споры, возникающие между работником и работодателем по поводу реализации или защиты трудовых прав и обязанностей. Их следует рассматривать не только как юридический конфликт, но и как **механизм перехода от факта нарушения права к его юридической оценке и восстановлению**. Законодатель относит разрешение трудовых споров к основным способам защиты трудовых прав наряду с самозащитой, государственным и общественным контролем, а также примирительно-посредническими процедурами (Rahimqulova, 2021).

Согласно статье 545 Трудового кодекса, индивидуальные трудовые споры рассматриваются комиссиями по трудовым спорам и судами. Работник вправе обратиться в комиссию либо непосредственно в суд, а медиация может применяться на любой стадии рассмотрения спора до удаления суда в совещательную комнату (Nurmagambetov, 2022).

Особое значение имеет конечный результат разрешения спора. При незаконном прекращении трудового договора, переводе, изменении условий труда или отстранении от работы законодатель предусматривает восстановление работника на прежней работе и условиях труда, а также выплату среднего заработка за время вынужденного прогула либо разницы в заработной плате (Boboraimova, 2025). Следовательно, эффективность разрешения трудового спора должна оцениваться не только по факту принятия решения, но и по степени **реального восстановления нарушенного трудового права**.

Комиссия по трудовым спорам является внесудебным механизмом разрешения индивидуальных трудовых споров. Заявление работника подлежит регистрации, после чего комиссия устанавливает обстоятельства спора, исследует доказательства и применяет соответствующие нормы законодательства. Срок рассмотрения составляет **десять календарных дней** со дня подачи заявления (Mamasharifovich, 2025). Если спор не рассмотрен или не разрешен в установленный срок, работник вправе обратиться в суд. Решение комиссии также может быть обжаловано в судебном порядке.

Судебная защита применяется, в частности, по спорам о восстановлении на работе, изменении даты и основания прекращения трудового договора, оплате времени вынужденного прогула, возмещении вреда, компенсации морального вреда, отказе в приеме на работу и дискриминации в сфере труда (Boboraimova, 2025). При этом установлены сроки обращения: по спорам о восстановлении на работе – **три месяца**, по другим индивидуальным трудовым спорам – **шесть месяцев** со дня, когда работник узнал или должен был узнать о нарушении своего права. На период проведения медиации течение срока обращения в суд приостанавливается.

Несмотря на наличие указанных процедур, их нормативное закрепление само по себе не гарантирует эффективного восстановления нарушенных прав. Практическая эффективность механизма зависит от оперативности рассмотрения спора, доступности доказательств, объективности их оценки и фактического исполнения принятого решения.

Во-первых, проблемным остается обеспечение оперативности разрешения трудовых споров. Установление процессуальных сроков не всегда означает быстрое восстановление права, особенно когда нарушение связано с прекращением трудового договора или невыплатой заработной платы. Поэтому необходимо сокращать неоправданные процедурные задержки и обеспечивать своевременное исполнение решений.

Во-вторых, требует совершенствования механизм доказывания. Современные трудовые отношения сопровождаются использованием электронных документов, сведений информационных систем и электронной переписки. При этом значительная часть доказательств находится у работодателя, что может затруднять их получение работником. В связи с этим целесообразно выработать единые подходы к использованию и оценке электронных доказательств при разрешении трудовых споров (Mamasiddikov et al., 2024).

В-третьих, необходимо усилить гарантии фактического восстановления нарушенного права. Принятие решения в пользу работника не всегда означает немедленное устранение последствий нарушения. Поэтому совершенствование законодательства и правоприменительной практики должно обеспечивать максимально быстрый переход от принятия решения к его фактическому исполнению.

Таким образом, совершенствование механизма разрешения индивидуальных трудовых споров целесообразно осуществлять по трем основным направлениям: **повышение оперативности процедур,**

совершенствование правил работы с доказательствами, включая электронные, и усиление гарантий фактического исполнения решений. Это позволит обеспечить не формальное рассмотрение трудового спора, а его основную цель – своевременное и эффективное восстановление нарушенных трудовых прав работников.

ЗАКЛЮЧЕНИЕ

Проведённый анализ показывает, что в Республике Узбекистан сформирован комплексный механизм разрешения индивидуальных трудовых споров, включающий деятельность комиссий по трудовым спорам, судебную защиту и медиацию. Вместе с тем его эффективность требует совершенствования в части **оперативности рассмотрения споров, использования и оценки электронных доказательств и своевременного исполнения принятых решений**. Совершенствование данного механизма должно быть ориентировано не на формальное разрешение спора, а на **своевременное и фактическое восстановление нарушенных трудовых прав работников**, что соответствует конституционным гарантиям судебной защиты и принципу гарантированности трудовых прав.

БИБЛИОГРАФИЧЕСКИЕ ССЫЛКИ:

1. Конституция Республики Узбекистан от 01 апреля 2023 г. // https://lex.uz/docs/6445147

2. Трудовой кодекс Республики Узбекистан от 30 апреля 2023 г. // https://lex.uz/ru/docs/6257291

3. Постановление пленума Верховного суда Республики Узбекистан "О практике применения судами законодательства, регулирующего прекращение трудового договора" от 20.11.2023 № 26 // https://lex.uz/ru/docs/6684617

4. Aktamovich, R. M. (2020). Overview Of Legislation Of Uzbekistan On The Protection Of Employees' Rights. *The American Journal of Political Science Law and Criminology*. https://doi.org/10.37547/tajpslc/volume02issue11-12

5. Boboraimova, M. (2025). Judicial Provision Of The Right To Reinstatement: Legal Basis And Practical Problems. *The American Journal of Political Science Law and Criminology*. https://doi.org/10.37547/tajpslc/volume07issue06-06

6. Khamzina, Z., Buribayev, Y., Turlykhankyzy, K., Moldakhmetova, Z., Koshpenbetov, B., & Nessibeli, K. (2021). Unloading the Judicial System in Kazakhstan?

Alternative Ways of Resolving Individual Labour Disputes. *Comparative Law Review*. https://doi.org/10.12775/clr.2021.011

7. Mamasharifovich, B. H. (2025). Pre-trial resolution of individual labor disputes. *American Journal Of Social Sciences And Humanity Research*. https://doi.org/10.37547/ajsshr/volume05issue03-02

8. Musakhonovich, M. M., Esirgapovich, E. A., Jaelani, A. K., Khairuldin, W. M. K. F. W., & Luthviati, R. D. (2024). The Protection of Labor Rights on the Court System. *Journal of Human Rights, Culture and Legal System*. https://doi.org/10.53955/jhcls.v4i1.115

9. Nurmagambetov, A. (2022). PROCEDURAL ASPECTS OF LABOR LAW: THE EXPERIENCE OF UZBEKISTAN AND KAZAKHSTAN. *The American Journal of Political Science Law and Criminology*. https://doi.org/10.37547/tajpslc/volume04issue02-05

10. Oliinyk, O. (2022). On the issue of resolving labor disputes in court. *Uzhhorod National University Herald. Series: Law*. https://doi.org/10.24144/2307-3322.2022.70.28

11. Rahimqulova, L. (2021). The Procedure For Resolving Individual Labour Disputes In Uzbekistan, Post-Soviet Countries And Some Developed Countries. Comparative-Legal Analysis. *İlköğretim Online*. https://doi.org/10.17051/ilkonline.2021.03.167

UDC: 392.3(=512.143)

GIVING A SHARE ("ENSHI") IN THE TRADITIONAL SOCIETY OF THE KARAKALPAKS: SOCIO-ECONOMIC FUNCTION AND TRANSFORMATION

Tazhetdinova B. N.

Basic Doctoral Student of the Department of Ethnography, Karakalpak Humanitarian Research Institute of the Karakalpak Branch of the Academy of Sciences of the Republic of Uzbekistan (179 A Amir Temur Street, Nukus, 230100, Republic of Karakalpakstan, Uzbekistan)

E-mail: bagilatazetdinova@gmail.com

ORCID ID: https://orcid.org/0009-0006-6334-0207

Abstract: *This article provides an ethnological analysis of the tradition of giving a share ("enshi") in the traditional lifestyle of the Karakalpaks. The study identifies the material and social significance of enshi within the Karakalpak family. Various forms of granting enshi—such as those given to a nephew (sister's son), a newly separated young family, and a married daughter—are examined. Based on the research findings, enshi is substantiated as an important institution within the traditional socio-economic relations of the Karakalpaks.*

Keywords: *Karakalpaks, gift, kinship, nephew (zhiyen), maternal uncle (dayi), enshi (share/inheritance portion), transformation.*

INRTODUCTION

Giving gifts and exchanging them in the life of peoples is characterized as a symbol of respect and a guarantee of mutual solidarity and harmony. This practice, widespread among the people, reflects such virtues as humility, generosity, and hospitality. Issues of traditional gift-giving or gift exchange have been thoroughly studied by researchers such as N. L. Zhukovskaya [5], A. A. Badmaev [2], M. M. Sodnompilova [9], and O. B. Naumova [8], while gift-exchange relations in the life of neighboring Kazakhs have been explored by

scholars such as N. Zh. Shakhanova [13], S. Werner [11], and Z. K. Suraganova [10].

In the traditional family ceremonies of the Karakalpak people, specific rules and types of gift-giving, which served as a tool for mutual relations, were formed. These traditions have been extensively studied in the works of researchers such as U. Kusekeev [7], A. Bekmuratova [3], H. Esbergenov and T. Atamyratov [4]. In their scientific works, specific types of gift-giving such as *qede*, *sybaga*, *enshi*, and *sarpay* are specially indicated. These studies are fundamental in Karakalpak ethnography, as they were limited to presenting the existence and bestowal of these types of gifts. Meanwhile, in the studies of G. Khozhaniyazova, the types of gifts given by parents and close relatives to a married son and a married daughter—such as *nemewrin* and giving *sybaga* [12, 266-282]—are studied within the framework of mutual assistance.

Thus, as A. Arginbayev notes, in the division of inheritance, Kazakhs distributed a share not only to their sons but also to their daughters. He substantiates that this portion given to a daughter was called *sybaga*, and among the people it was referred to as *torkinlew* or *enshi* [1,230]. Z. Suraganova's research proves that giving *enshi* is a traditional type of gift that has been ongoing among the Kazakh people for centuries [10,156].

In the life of the Kyrgyz people, among the gifts presented on a traditional family scale, there is the tradition of giving *enshi* (called *enchi* in Kyrgyz, B. T.), which in content practically does not differ from the tradition of giving *enshi* in the Karakalpak and Kazakh peoples. Usually (taking into account whether the parents have children, the daughter-in-law's modesty and industriousness, the married son's capability, etc.), from the common family property, an *enchi* was allocated to them—that is, several different livestock (for example, a mare with a foal, a cow with a calf, several sheep with lambs, and goats with kids) [6,296].

In Karakalpak ethnography, fundamental research has been carried out regarding the types and order of bestowal of the *enshi* tradition. However, its functions in kinship relations, mutual assistance, and ensuring the economic stability of a young family, as well as its changes in modern life, have not been sufficiently studied, which increases the relevance of our research. The purpose of our study is to determine the role of the *enshi* tradition in strengthening kinship ties and its current transitional state based on ethnographic materials.

MAIN BODY

As for the Karakalpaks, among the gifts given by elders with the aim of caring for the youth, giving *enshi* is considered the most substantial. Gender characteristics are also noticeable in the *enshi* tradition. The *enshi* given to a son mostly consists of property and livestock necessary to establish him as a separate family and build an independent household, whereas the *enshi* given to a daughter is aimed at easing her life in the newly formed family and serving as material support. This situation also reflects traditional concepts associated with the economic status of men and women in the Karakalpak family. A most noteworthy issue regarding *enshi* is the attention paid to its role in connecting kinship relations between a maternal uncle (*dayi*) and a nephew (*zhiyen*). Through giving *enshi* to a nephew, the maternal side demonstrated its social responsibility towards the nephew. Therefore, it is observed that giving *enshi* is not just a one-time material assistance, but a traditional social practice that repeatedly strengthens kinship ties.

Consequently, regardless of the basis on which *enshi* is given among the Karakalpaks, we observe that parents and close relatives perform it in the function of a policy for material provision of their child and an investment in their future.

It is also appropriate to note that the volume and content of *enshi* varied depending on the material condition of the family. While affluent families gave

large cattle, small livestock, household property, and various farm utensils, in families with limited material possibilities, *enshi* was limited to a small number of livestock or items necessary for daily life. This shows that *enshi* was not adapted to a fixed standard, but rather to the economic capability of the family.

CONCLUSION

In conclusion, paying attention to the results of the conducted ethnographic field notes, it was observed that the tradition of giving *enshi* is absent among the Uzbek population living in Turtkul and Beruni districts, whereas among the Kazakh and Turkmen ethnic groups living locally there, the *enshi* tradition has been preserved up to the present day, and the practical application of this type of gift continues to be observed today.

REFERENCES:

1. **Arhynbayev, H. A.** (1973). *Semya i brak u kazakhov (Istoriko-etnograficheskiy obzor)* [Family and marriage among the Kazakhs: Historical-ethnographic review] (Ə. X. Marhulan, Ed.). Nauka.

2. **Badmaev, A. A.** (2013). Daroobmen v sotsialno-politicheskikh praktikakh zabaykalskikh buryat vo vtoroy polovine XVIII – pervoy polovine XIX veka [Gift exchange in the socio-political practices of Transbaikal Buryats in the second half of the 18th and first half of the 19th centuries]. *Vestnik Novosibirskogo gosudarstvennogo universiteta. Seriya: Istoriya, filologiya*, 12(7), 276–280.

3. **Bekmuratova, A.** (1969). *Byt i semya karakalpakov v proshlom i nastoyaschem* [Life and family of the Karakalpaks in the past and present]. Karakalpakstan.

4. **Esbergenov, H., & Atamyratov, T.** (1975). *Traditsii i ikh preobrazovanie v gorodskom bytu karakalpakov* [Traditions and their transformation in the urban life of the Karakalpaks]. Karakalpakstan.

5. **Zhukovskaya, N. L.** (1986). «Podarok – otdarok» i ego mesto v sisteme sotsialnykh tsennostey mongolov [“Gift and counter-gift” and its place in the system of social values of the Mongols]. In *Mongolica: pamyati akademika B.Ya. Vladimirtsova* (pp...). Nauka.

6. **Asankanov, A. A., Brusina, O. I., & Zhaparov, A. Z.** (Eds.). (2016). *Kyrgyzy* [The Kyrgyzs]. Nauka.

7. **Kusekeev, U.** (1934). *Etnografiya KKASSR* [Ethnography of the Karakalpak ASSR]. Manuscript Fund of the Fundamental Library of the Karakalpak Branch of the Academy of Sciences of the Uzbek SSR, Inv. No. 932.

8. **Naumova, O. B.** (2023). Koshumcha – traditsiya vzaimopomoshchi v sovremennom kyrgyzskom obschestve [Koshumcha – the tradition of mutual assistance in modern Kyrgyz society]. *Vestnik antropologii*, (1), 42–62.

9. **Sodnompilova, M. M.** (2018). Obryadovoe ispolzovanie odezhdy mongolskikh narodov v proshlom i nastoyaschem [Ritual use of clothing among Mongolian peoples in the past and present]. *Izvestiya Irkutskogo gosudarstvennogo universiteta*, 23, 111–123.

10. **Suraganova, Z. K.** (2009). *Traditsionnyy obmen darami u kazakhov* [Traditional gift exchange among the Kazakhs]. KAM Mediaprint.

11. **Werner, C.** (2000). Gifts, bribes, and development in post-Soviet Kazakstan. *Human Organization*, 59(1), 11–22.

12. **Khozhaniyazova, G. M.** (2025). Znachenie vzaimopomoshchi v svadebnykh traditsiyakh karakalpakov (na primere dosvadebnykh obryadov) [The significance of mutual assistance in the wedding traditions of the Karakalpaks: On the example of pre-wedding rituals]. *Vestnik antropologii*, (4), 266–282.

13. **Shakhanova, N. Zh.** (1998). *Mir traditsionnoy kultury kazakhov (etnograficheskie ocherki)* [The world of traditional culture of the Kazakhs: Ethnographic essays]. Kazahstan.

УГОЛОВНО-ПРАВОВАЯ ЗАЩИТА ПОТЕРПЕВШЕЙ ОТ ИЗНАСИЛОВАНИЯ

Касымова Муслима Солиховна

Аннотация. В тезисах рассматривается уголовно-правовая *защита потерпевшей от изнасилования по законодательству Республики Узбекистан. Анализируются квалифицирующие признаки состава преступления, связанные с личностью потерпевшей, — возраст и беспомощное состояние, — а также их разграничение со смежным составом (ст. 128 УК РУз). Рассматриваются недавние законодательные изменения, направленные на усиление ответственности, и формулируются предложения по совершенствованию нормы, в частности по легальному закреплению понятия «беспомощное состояние».*

Ключевые слова: *изнасилование; потерпевшая; половая неприкосновенность; половая свобода; беспомощное состояние; квалифицирующие признаки; уголовное законодательство Узбекистана; защита прав потерпевших.*

Abstract. *This paper examines the criminal-law protection of rape victims under the legislation of the Republic of Uzbekistan. It analyzes the qualifying features of the offense related to the victim's identity — age and helpless state — and their distinction from the related offense under Article 128 of the Criminal Code. Recent legislative amendments aimed at strengthening liability are reviewed, and proposals are formulated for improving the provision, in particular a statutory definition of "helpless state."*

Keywords: *rape; victim; sexual inviolability; sexual freedom; helpless state; aggravating circumstances; criminal legislation of Uzbekistan; victim protection.*

Уголовно-правовая наука традиционно рассматривает состав изнасилования преимущественно через призму личности виновного и объективной стороны деяния, способа его совершения, наступивших последствий, форм соучастия. Однако не менее значимым является и второй ракурс: то, каким образом закон конструирует защиту личности самой потерпевшей, её возраста, физического и психического состояния, и насколько эта защита является полной и внутренне непротиворечивой.

Именно этому вопросу применительно к действующему законодательству Республики Узбекистан посвящён настоящий тезис.

АКТУАЛЬНОСТЬ ТЕМЫ

Конституция Республики Узбекистан гарантирует каждому человеку защиту его прав и свобод, включая право на половую свободу и половую неприкосновенность личности[52]. Реализация этой конституционной гарантии в нормах уголовного закона представляет собой самостоятельную и практически значимую задачу, поскольку именно уголовно-правовая охрана определяет объём и характер защиты, реально предоставляемой лицу, пострадавшему от посягательства на половую свободу.

За последние годы законодатель Узбекистана последовательно усиливает уголовно-правовую защиту в этой сфере. Законом Республики Узбекистан от 11 апреля 2023 года № ЗРУ-829 санкция статьи 118 Уголовного кодекса («Изнасилование») была ужесточена: сроки лишения свободы увеличены с трёх-семи[53] до пяти-восьми лет[54]. Данное изменение было представлено официальными источниками как часть более широкой политики усиления защиты женщин и детей[55]. Несколько ранее, Законом от 7 декабря 2021 года № ЗРУ-735, были внесены изменения, связанные с дальнейшим совершенствованием системы обеспечения гарантий прав ребёнка, затронувшие в том числе нормы о преступлениях против половой

[52] Конституция Республики Узбекистан.

[53] Уголовный кодекс Республики Узбекистан от 22 сентября 1994 года (в действующей редакции) // lex.uz. — Глава IV «Преступления против половой свободы», статья 118.

[54] Закон Республики Узбекистан от 11 апреля 2023 года № ЗРУ-829 «О внесении изменений и дополнений в некоторые законодательные акты Республики Узбекистан».

[55] Как новый закон усилит защиту женщин и детей. Обзор документа // Газета.uz, 12 апреля 2023 г.

свободы[56]. Эти шаги свидетельствуют об устойчивой государственной политике, ориентированной именно на усиление защиты потерпевшей стороны, а не только на ужесточение ответственности виновного как таковое.

Вместе с тем степень научной разработанности проблемы уголовно-правовой защиты личности потерпевшей от изнасилования в узбекской правовой науке остаётся недостаточной: комплексных монографических исследований, посвящённых непосредственно этому вопросу, на сегодняшний день не выявлено. Для сравнения, в соседних государствах региона подобная проблематика получила самостоятельную научную разработку: в Казахстане, в работах С.М. Рахметова и А.К. Мукажанова[57], в Кыргызстане, в диссертационном исследовании Н.К. Маматазизовой[58]. Указанное обстоятельство обусловливает научную новизну обращения к данной теме применительно к законодательству Узбекистана и оправдывает выбор темы для дальнейшей углублённой разработки.

Личность потерпевшей как критерий дифференциации уголовной ответственности

Статья 118 УК РУз, расположенная в главе IV Особенной части («Преступления против половой свободы»), построена по принципу дифференциации ответственности в зависимости от ряда обстоятельств, среди которых существенное место занимают именно характеристики потерпевшей, а не только действия виновного.

[56] Закон Республики Узбекистан от 7 декабря 2021 года № ЗРУ-735 «О внесении изменений и дополнений в некоторые законодательные акты Республики Узбекистан в связи с дальнейшим совершенствованием системы обеспечения гарантий прав ребёнка».

[57] Рахметов С.М., Мукажанов А.К. Изнасилование (уголовно-правовые и криминологические проблемы). — Алматы, 2003.

[58] Маматазизова Н.К. Криминологическая и уголовно-правовая характеристика изнасилования по уголовному законодательству Кыргызской Республики: автореф. дис. ... канд. юрид. наук. — Бишкек, 2006.

Возраст потерпевшей. Согласно правовой позиции Пленума Верховного суда Республики Узбекистан, сформулированной в постановлении от 29 октября 2010 года № 13 «О судебной практике по делам об изнасиловании и удовлетворении половой потребности в противоестественной форме» (в редакции последующих изменений)[59], несовершеннолетние потерпевшие, не достигшие четырнадцатилетнего возраста (малолетние), во всех случаях признаются находящимися в беспомощном состоянии. Это влечёт квалификацию содеянного по части четвёртой статьи 118 УК, то есть по наиболее строгой части нормы. Таким образом, возраст потерпевшей юридически трансформируется в квалифицирующий признак повышенной общественной опасности деяния независимо от того, оказывала ли она фактическое сопротивление.

Беспомощное состояние. Данное понятие носит более широкий характер, чем возрастной критерий, и по смыслу правоприменительной практики может охватывать физическую неспособность оказать сопротивление, психическое расстройство, бессознательное состояние и иные обстоятельства, объективно лишающие потерпевшую возможности понимать характер и значение совершаемых в отношении неё действий либо оказывать им сопротивление. Именно наличие такого состояния (наряду с применением насилия или угрозы его применения) законодатель рассматривает как альтернативное основание для констатации отсутствия добровольного согласия потерпевшей.

Разграничение со статьёй 128 УК. Принципиальное значение для объёма защиты несовершеннолетней потерпевшей имеет отграничение состава изнасилования от состава, предусмотренного статьёй 128 УК РУз

[59] Постановление Пленума Верховного суда Республики Узбекистан от 29 октября 2010 года № 13 «О судебной практике по делам об изнасиловании и удовлетворении половой потребности в противоестественной форме» (в редакции постановлений от 14 мая 2022 г. № 9, от 20 ноября 2023 г. № 30, от 16 декабря 2024 г. № 39).

(«Вступление в половую связь с лицом, не достигшим шестнадцати лет»). Как разъяснено Пленумом Верховного суда, ответственность по статье 128 УК наступает лишь в случаях, когда половое сношение с лицом, не достигшим шестнадцатилетнего возраста, совершено без применения насилия или угроз и с согласия потерпевшего лица, понимавшего характер и значение совершаемых действий[60]. Иными словами, закон различает две принципиально разные с точки зрения объёма защиты ситуации: защиту от принуждения (ст. 118 УК, где степень защиты не зависит от возраста как такового) и защиту в силу самого возраста при отсутствии принуждения (ст. 128 УК). Для потерпевшей в возрасте от четырнадцати до шестнадцати лет это разграничение имеет решающее практическое значение, поскольку именно от установления факта насилия или угрозы зависит, какая из норм с существенно различающимися санкциями будет применена.

Проблемные вопросы правового регулирования. При общей положительной оценке тенденции к усилению защиты потерпевшей можно выделить ряд нерешённых вопросов, представляющих интерес для дальнейшего исследования.

Во-первых, само понятие «беспомощное состояние» не имеет легального определения непосредственно в тексте Уголовного кодекса. Его содержание раскрывается преимущественно посредством актов судебного толкования, постановлений Пленума Верховного суда, что создаёт риск неединообразного применения данного признака в судебной практике и ставит вопрос о целесообразности его законодательной дефиниции непосредственно в статье 118 либо в разделе восьмом УК РУз («Правовое значение терминов»).

[60] Там же, п. 7 (о разграничении со статьёй 128 УК).

Во-вторых, правило о том, что малолетний возраст потерпевшей (до 14 лет) автоматически приравнивается к беспомощному состоянию, было прямо закреплено на уровне постановления Пленума лишь дополнительным абзацем, введённым постановлением от 20 ноября 2023 года № 30[61], то есть спустя более десяти лет после принятия базового постановления 2010 года. Формирование столь значимого для квалификации правила на уровне судебного, а не законодательного акта вновь актуализирует вопрос о степени детализации соответствующих признаков непосредственно в тексте нормы.

В-третьих, требует отдельного осмысления фактический объём защиты, предоставляемой потерпевшей в возрасте от четырнадцати до шестнадцати лет. В отличие от малолетних, автоматически защищённых через категорию «беспомощное состояние», правовое положение этой группы в большей степени зависит от доказывания факта применения насилия или угроз, что на практике может создавать более высокий порог защиты и, соответственно, менее полную охрану интересов данной возрастной группы по сравнению с малолетними потерпевшими.

В-четвёртых, само построение защиты вокруг признаков возраста и беспомощности оставляет за рамками детального регулирования иные значимые для потерпевшей обстоятельств, в частности, наличие у неё инвалидности, тяжёлого материального или служебного (зависимого) положения по отношению к виновному, которые в законодательстве ряда других государств выделяются в качестве самостоятельных квалифицирующих признаков, тогда как в действующей редакции статьи 118 УК РУз они могут учитываться судом лишь опосредованно, через

[61] Там же, п. 7, абзац второй (введён постановлением от 20 ноября 2023 г. № 30).

оценочную категорию «беспомощное состояние» либо вовсе не находить прямого отражения в квалификации содеянного.

Выводы и предложения

Действующее законодательство Республики Узбекистан демонстрирует последовательную тенденцию к усилению уголовно-правовой защиты потерпевшей от изнасилования, что выражается как в ужесточении санкции статьи 118 УК, так и в развитии судебного толкования, конкретизирующего защиту наиболее уязвимых категорий потерпевших. Вместе с тем сохраняется потребность в более чёткой законодательной регламентации оценочных признаков, прежде всего понятия «беспомощное состояние».

По итогам проведённого анализа представляется возможным сформулировать следующие предложения:

1. Рассмотреть вопрос о включении в раздел восьмой УК РУз («Правовое значение терминов») легального определения понятия «беспомощное состояние потерпевшей» применительно к главе IV Особенной части.

2. Закрепить непосредственно в тексте части четвёртой статьи 118 УК (а не только в акте судебного толкования) положение о том, что достижение потерпевшей малолетнего возраста само по себе означает нахождение в беспомощном состоянии, что повысит правовую определённость и приведёт норму закона в соответствие со сложившейся правоприменительной практикой.

3. Изучить целесообразность выделения дополнительных квалифицирующих признаков, связанных с уязвимым положением потерпевшей (инвалидность, служебная или материальная зависимость от виновного), с учётом соответствующего зарубежного опыта.

Данные предложения не направлены на изменение существа уже сложившегося подхода, а имеют целью повышение его правовой определённости и единообразия применения — что представляется важным шагом на пути дальнейшего усиления реальной, а не только декларируемой защиты потерпевшей от изнасилования.

СПИСОК ИСПОЛЬЗОВАННОЙ ЛИТЕРАТУРЫ

1) Конституция Республики Узбекистан.
2) Уголовный кодекс Республики Узбекистан от 22 сентября 1994 года (в действующей редакции) // lex.uz. — Глава IV «Преступления против половой свободы», статья 118.
3) Закон Республики Узбекистан от 11 апреля 2023 года № ЗРУ-829 «О внесении изменений и дополнений в некоторые законодательные акты Республики Узбекистан».
4) Как новый закон усилит защиту женщин и детей. Обзор документа // Газета.uz, 12 апреля 2023 г.
5) Закон Республики Узбекистан от 7 декабря 2021 года № ЗРУ-735 «О внесении изменений и дополнений в некоторые законодательные акты Республики Узбекистан в связи с дальнейшим совершенствованием системы обеспечения гарантий прав ребёнка».
6) Рахметов С.М., Мукажанов А.К. Изнасилование (уголовно-правовые и криминологические проблемы). — Алматы, 2003.
7) Маматазизова Н.К. Криминологическая и уголовно-правовая характеристика изнасилования по уголовному законодательству Кыргызской Республики: автореф. дис. ... канд. юрид. наук. — Бишкек, 2006.
8) Постановление Пленума Верховного суда Республики Узбекистан от 29 октября 2010 года № 13 «О судебной практике по делам об изнасиловании и удовлетворении половой потребности в противоестественной форме» (в редакции постановлений от 14 мая 2022 г. № 9, от 20 ноября 2023 г. № 30, от 16 декабря 2024 г. № 39).
9) Там же, п. 7 (о разграничении со статьёй 128 УК).
10) Там же, п. 7, абзац второй (введён постановлением от 20 ноября 2023 г. № 30).

AL-ZAHRAWI'S KITĀB AL-TAṢRĪF: SYSTEMATIZING MEDIEVAL SURGERY

G. M. Ibrohimova

Independent Researcher, Fergana State University

gulhayoibrohimova@gmail.com

Annotation. *The history of surgery is not limited to the development of operative techniques; it also encompasses the formation of anatomical knowledge, professional standards, technical instruments, clinical observation, and systems for transmitting practical knowledge. Within the medieval Islamic medical tradition, Abu al-Qasim Khalaf ibn al-Abbas al-Zahrawi (936–1013 CE), known in Latin Europe as Albucasis, occupies a particularly important position because of the systematic treatment of surgery in his encyclopedic* Kitāb al-Taṣrīf li-man ʿajiza ʿan al-taʾlīf.

Keywords: *al-Zahrawi; Albucasis;* Kitāb al-Taṣrīf*; medieval surgery; history of medicine; surgical instruments; anatomy; al-Andalus; medical education; Islamic medicine*

METHODS

A qualitative historical-analytical methodology was employed. The study examined the surgical material of *Kitāb al-Taṣrīf* together with peer-reviewed historical and medical literature published between 1986 and 2026. Sources were identified primarily through PubMed and scholarly databases and were analyzed thematically according to five analytical categories: anatomical preparation, operative classification, clinical practice, instrumentation, and professional education. Historical claims were interpreted within their medieval context rather than evaluated retrospectively according to modern clinical standards.

RESULTS

The analysis indicates that al-Zahrawi presented surgery as an activity requiring theoretical knowledge, anatomical competence, practical experience, technical precision, and professional caution. The surgical material of *Kitāb al-*

Taṣrīf organizes operative knowledge into major domains including cauterization, incision and related procedures, wound treatment, and the management of fractures and dislocations. The work also contains extensive descriptions and illustrations of surgical instruments, with modern scholarship identifying more than 200 illustrated instruments. His writings address a broad range of operative fields, including trauma, orthopedics, otorhinolaryngology, abdominal surgery, neurological disorders, obstetrics, and reconstructive procedures. The study further demonstrates that al-Zahrawi's contribution consisted not merely of individual technical innovations but of the organization and transmission of practical surgical knowledge.

INTRODUCTION

Surgery occupies a distinctive position in the history of medicine because its development has always depended upon the interaction of theoretical knowledge and practical intervention. Unlike purely descriptive forms of medical knowledge, surgery requires the practitioner to translate anatomical and pathological understanding into controlled physical action. Consequently, the historical development of surgery involves not only procedures but also the emergence of professional competencies, technical instruments, operative classifications, and mechanisms for transmitting practical knowledge.

Within the medieval Islamic medical tradition, Abu al-Qasim Khalaf ibn al-Abbas al-Zahrawi represents one of the most significant figures in this process. Born in al-Andalus in the tenth century, al-Zahrawi produced *Kitāb al-Taṣrīf li-man ʿajiza ʿan al-taʾlīf*, a thirty-treatise medical encyclopedia that brought together knowledge concerning medicine, surgery, pharmacology, therapeutics, and related disciplines. Its final surgical section became particularly influential because of its extensive treatment of operative techniques and surgical instruments (Zarrintan et al., 2020). The surgical component of *Kitāb al-Taṣrīf* is historically significant not simply because of the number of

procedures described, but because of the way those procedures were organized and explained. Al-Zahrawi connected operative practice with anatomical understanding, clinical judgment, instrument selection, wound management, and post-operative care. Modern scholarship has consequently characterized his work as an important contribution to the systematization of medieval surgery (Zarrintan et al., 2020; Al Aloul, 2026).

Research problem. The historical literature on al-Zahrawi has often emphasized individual surgical procedures or described him in highly celebratory terms as a "father" or "pioneer" of surgery. Such descriptions reflect his enduring reputation, but they can obscure a more analytically useful question: What features of al-Zahrawi's writings contributed to the transformation of surgery into a structured and professionally transmissible body of knowledge?

This question is particularly important because medieval surgery cannot be understood adequately by comparing isolated techniques directly with contemporary operations. Such comparisons risk anachronism. A historically grounded analysis should instead investigate how surgical knowledge was conceptualized, organized, documented, taught, and transmitted within the intellectual environment of the medieval Islamic world.

Recent scholarship has expanded considerably beyond general biographical accounts. Studies have examined al-Zahrawi's neurological procedures, surgical instruments, orthopedic contributions, plastic and reconstructive techniques, gynecomastia surgery, and particular operative procedures (Asaad et al., 2019; Abdulrazeq et al., 2024; Abdoli & Mahlooji, 2025).

Nevertheless, these studies are frequently organized around individual specialties or procedures. A comparatively less explored issue is the epistemic structure of al-Zahrawi's surgery: namely, how anatomy, practical experience,

classification, instruments, written description, and pedagogy function together as components of a professional discipline.

The present study addresses this gap by treating *Kitāb al-Taṣrīf* not simply as a collection of medieval surgical techniques but as a historical example of the organization and transmission of practical medical knowledge.

Methods. This study employed a qualitative historical-analytical design. Because the subject concerns the historical formation of medical knowledge rather than contemporary clinical effectiveness, a qualitative approach was considered appropriate.

The analysis was based on two complementary levels:

- examination of the surgical content and conceptual organization of *Kitāb al-Taṣrīf*;
- critical synthesis of modern historical and medical scholarship concerning al-Zahrawi's surgical contribution.

The study does not attempt to establish the clinical effectiveness of medieval procedures according to contemporary evidence-based medicine. Instead, it reconstructs the intellectual and practical significance of those procedures within their historical context.

Results. The analysis demonstrates that al-Zahrawi did not conceptualize surgery as an exclusively manual craft. Surgical intervention was connected to knowledge of the body's structures and the anatomical relationships relevant to operative procedures.

This relationship between anatomy and surgery is important for understanding al-Zahrawi's professional model. The surgeon's technical action was expected to be guided by knowledge rather than by manual dexterity alone. Recent scholarship similarly emphasizes al-Zahrawi's insistence on anatomical competence, operative prudence, and adequate medical preparation (Al Aloul, 2026).

The principle has particular historical significance because it establishes a conceptual hierarchy in which practical intervention depends upon prior intellectual preparation. Surgery consequently becomes part of medicine rather than an independent manual occupation.

The surgical material of *Kitāb al-Taṣrīf* demonstrates a clear tendency toward classification. The three surgical books traditionally associated with the final treatise address cauterization; incision, perforation, venesection, and wounds; and the management of fractures and dislocations (Chavoushi et al., 2012).

The importance of this classification extends beyond its organizational convenience. A body of knowledge becomes teachable and reproducible when individual techniques are situated within recognizable conceptual categories.

Al-Zahrawi's organization therefore represents an important feature of disciplinary formation. Instead of presenting isolated procedures as disconnected acts, he assembled them into a structured corpus that could be consulted according to the clinical problem encountered. Cauterization occupies a substantial place in the surgical material. Al-Zahrawi's descriptions demonstrate attention to the location, extent, instrument, and purpose of cauterization.

Historically, this is significant because it illustrates an attempt to convert practical experience into explicit procedural instructions. The value of such descriptions lies not in whether medieval cauterization corresponds to a modern treatment modality, but in the fact that the practitioner was provided with a structured account of how the intervention was to be performed. The emphasis on procedural precision is consistent with al-Zahrawi's broader surgical philosophy: operative intervention should be deliberate rather than improvised.

The treatment of wounds represents another central component of al-Zahrawi's surgical practice. The surgical writings address procedures involving bleeding, wound cleaning, closure, dressings, and medicinal substances.

The evidence suggests that al-Zahrawi viewed surgery as a process rather than a single event. Intervention included preparation, operative manipulation, control of bleeding, closure or dressing, and subsequent care.

This integrated approach is historically important because it places postoperative management within the scope of surgery itself. It also demonstrates the close relationship between surgical practice and pharmacological knowledge in medieval medicine.

Fractures and dislocations occupy an important position within the surgical corpus. Al-Zahrawi discussed the reduction and stabilization of injured structures and provided practical instructions concerning immobilization and bandaging.

Modern historical research confirms that his orthopedic writings combine inherited Greco-Roman medical knowledge with developments within Arabic medicine and pharmacology (Dimitriadis et al., 2019).

Particularly noteworthy is the recognition that musculoskeletal injuries required more than simple repositioning. The treatment involved attention to alignment, stabilization, swelling, and subsequent recovery. A further example of the sophistication of his trauma observations has been identified in a modern historical analysis that argues that al-Zahrawi described features corresponding to what is now termed acute compartment syndrome, centuries before its conventional attribution to later European surgery (Aslanabadi et al., 2023).

Such claims should be interpreted cautiously. They demonstrate historical observation rather than evidence that al-Zahrawi possessed the modern physiological concept of compartment syndrome.

Recent scholarship has drawn attention to the neurological material in *Kitāb al-Taṣrīf*. Abdulrazeq et al. (2024) reviewed the surgical chapters addressing neurological disorders and identified descriptions concerning cranial and spinal trauma, surgical devices, diagnostic observations, and prognosis.

The study indicates that al-Zahrawi's surgical knowledge extended to cranial trauma and spinal injuries and included procedures such as trephination and spinal traction. This material demonstrates the importance of anatomical and prognostic reasoning within his surgical practice.

The historical significance of these passages lies in the attempt to connect physical injury with functional consequences. Rather than treating the body as a collection of mechanically independent parts, al-Zahrawi's observations sometimes linked anatomical injury with neurological outcome.

Surgical instruments as material knowledge.

One of the most distinctive features of *Kitāb al-Taṣrīf* is its extensive treatment of surgical instruments.

Abdoli and Mahlooji (2025) report that more than 200 surgical instruments are presented in illustrated form in the surgical section and discuss possible historical sources for some of the instrument designs. The instruments should not be interpreted simply as a catalogue of objects. Each instrument embodies a relationship between anatomy, operative purpose, technique, and manual action.

Consequently, the illustrated instrument can be understood as a unit of **materialized surgical knowledge**. Its shape communicates information about the type of movement required, the anatomical location of use, and the intended therapeutic function.

The combination of textual description and visual representation therefore strengthened the reproducibility of technical knowledge.

Recent scholarship has specifically examined the knives described by al-Zahrawi. Khosravi et al. (2021) analyzed the types of surgical knives associated with his work and emphasized the relationship between instrument design and operative requirements.

The differentiation of knives illustrates an important characteristic of mature technical practice: instruments are not interchangeable. Variations in blade form correspond to variations in anatomical location, depth, incision type, and operative purpose.

This technical differentiation supports the broader interpretation of *Kitāb al-Taṣrīf* as a systematic surgical text rather than a simple narrative of personal medical experience. Al-Zahrawi's surgical corpus also includes obstetric and gynecological material. Modern historical scholarship has examined his descriptions of difficult childbirth and operative interventions in women (Ragab, 2022). His writings on gynecomastia provide another example of procedural adaptation. Chavoushi et al. (2012) demonstrated that although al-Zahrawi's description appears related to earlier Greek medical traditions, his modifications of the procedure and use of medicinal substances may reflect his own clinical experience. This finding is particularly important for understanding the nature of medieval scientific innovation. Al-Zahrawi's contribution did not necessarily depend upon creating procedures without precedent. Innovation could also occur through adaptation, refinement, observation, and contextual modification.

The surgical corpus also contains material concerning the ear, nose, throat, tonsils, and trachea. Historical research has identified descriptions of tonsillectomy and tracheostomy among the notable head-and-neck procedures in al-Zahrawi's work.

A recent historical analysis of tonsil surgery likewise reports that al-Zahrawi described indications, instruments, and operative technique for tonsillectomy (Khosravi et al., 2022). These examples reinforce the breadth of his surgical conception. Surgery was not confined to major external trauma but encompassed specialized interventions involving multiple anatomical regions.

Al-Zahrawi's work also contains procedures that have attracted the attention of modern historians of plastic and reconstructive surgery. Asaad et al.

(2019) analyzed his contributions to techniques corresponding to several areas of contemporary plastic surgery.

The historical significance of this material lies primarily in the evidence that reconstructive concerns—such as tissue repair and the management of visible bodily defects—formed part of the broader medieval surgical repertoire.

Again, it is methodologically preferable to describe these procedures as historical antecedents or comparable practices rather than to identify them uncritically with contemporary plastic surgery.

Pedagogy and professional transmission

The textual and visual structure of *Kitāb al-Taṣrīf* indicates that al-Zahrawi's objective extended beyond preserving information. The work was organized in a manner that made technical knowledge accessible to practitioners and learners.

The illustrated instruments were particularly important in this respect. A written name alone could not adequately communicate the physical form of a specialized surgical instrument. Illustration provided a means of stabilizing technical terminology by connecting the written description to a visual representation.

The pedagogical character of the work has been emphasized by modern scholars, who regard its combination of instruments, procedures, and explanatory text as an important feature of its historical influence (Zarrintan et al., 2020; Al Aloul, 2026).

DISCUSSION

Al-Zahrawi's work challenges a simplistic opposition between theoretical medicine and manual surgery. His surgical practice required both.

The surgeon needed theoretical knowledge to understand the body and practical competence to intervene upon it. Conversely, practical experience could refine theoretical knowledge by revealing complications, anatomical

variations, and limitations of inherited techniques. This reciprocal relationship between theory and practice is one of the strongest indications that *Kitāb al-Taṣrīf* represents an advanced stage in the organization of surgical knowledge.

Innovation as adaptation.

The example of gynecomastia surgery is particularly illustrative. Al-Zahrawi appears to have inherited elements of the procedure from earlier authorities while modifying its technical and therapeutic components (Chavoushi et al., 2012).

Similarly, his instruments existed within a broader historical tradition of surgical tools. Recent research examining possible parallels between his illustrations and earlier Egyptian representations cautions against attributing every instrument entirely to independent invention (Abdoli & Mahlooji, 2025).

Transmission to Europe

The historical significance of *Kitāb al-Taṣrīf* extends beyond al-Andalus. The work was translated into Latin in the twelfth century and subsequently circulated within European medical culture. Modern scholarship continues to identify the Latin transmission of the surgical text as an important component of its influence (Abdoli & Mahlooji, 2025; Chavoushi et al., 2012).2026, the historiography of medieval Islamic medicine remains an evolving field. Future manuscript studies and improved critical editions of Arabic surgical texts may modify interpretations of particular procedures of professional education in which practical skills were connected to theoretical knowledge and visual representation. The importance of this model lies in its recognition that technical competence cannot be transmitted solely through.

The process should not, however, be interpreted as a one-directional transfer from a static Islamic corpus to Europe. Translation involved selection,

interpretation, adaptation, and incorporation into different institutional environments. The significance of al-Zahrawi's work is therefore best understood within the broader history of intercultural knowledge circulation.

Historiographical caution

A recurrent problem in popular accounts of al-Zahrawi is the use of retrospective terminology such as "modern surgeon," "father of modern surgery," or "inventor of modern surgical instruments."

Such formulations can be useful as shorthand for his historical reputation, but they should not replace precise historical analysis. Medieval surgery operated without many fundamental features of modern medicine, including modern anesthesia, antisepsis, microbiology, blood transfusion, advanced imaging, and modern perioperative physiology.

Accordingly, the strongest historical claim is not that al-Zahrawi practiced modern surgery before modernity. Rather, his work demonstrates a sophisticated medieval process of **systematizing operative knowledge**.

CONCLUSION

This study examined the formation of surgery as a scientific and professional discipline through the surgical writings of Abu al-Qasim al-Zahrawi.

The findings indicate that the significance of *Kitāb al-Taṣrīf* cannot be reduced to a list of surgical procedures or instruments. Its deeper historical importance lies in the integration of anatomy, clinical experience, operative technique, pharmacological treatment, instrumentation, and pedagogy.

Al-Zahrawi presented surgical competence as dependent upon knowledge and experience. He organized operative procedures into identifiable categories, described techniques in procedural detail, documented the use

of specialized instruments, and combined textual explanations with visual representations.

His writings also demonstrate the breadth of medieval Islamic surgery, encompassing trauma, orthopedics, neurological disorders, otorhinolaryngology, obstetrics, gynecology, reconstructive procedures, and other areas of operative practice.

The evidence further suggests that al-Zahrawi's originality should be understood not merely as isolated invention. His contribution involved the critical assimilation of earlier medical traditions, adaptation of inherited techniques, incorporation of clinical observations, development and description of instruments, and systematic documentation.

Accordingly, *Kitāb al-Taṣrīf* may be regarded as a major historical example of the transformation of practical surgical experience into an organized, teachable, and transferable body of medical knowledge. Its subsequent circulation through translation demonstrates the importance of medieval Islamic medicine in the wider history of medical knowledge transmission.

REFERENCES

1. Abdoli, M., & Mahlooji, K. (2025). Potential source of Al-Zahrawi's knowledge of surgical instruments in the book of Al-Tasrif (10th A.D.). *Acta Chirurgica Belgica, 125*(2), 113–119. https://doi.org/10.1080/00015458.2024.2437271

2. Abdulrazeq, H. F., Ali, R., Najib, H., Doberstein, C., Oyelese, A., Gokaslan, Z., Malik, A. N., Asaad, W. F., & Greenblatt, S. (2024). Al-Zahrawi (936–1013 AD): On the surgical treatment of neurological disorders by the father of operative surgery. *World Neurosurgery, 184*, 236–240.e1. https://doi.org/10.1016/j.wneu.2024.01.169

3. Al Aloul, A. (2026). Al-Zahrawi surgical instruments and techniques: A milestone in the history of surgery. *Medicine and Pharmacy Reports, 99*(2), 156–159. https://doi.org/10.15386/mpr-2963

4. Al-Rodhan, N. R., & Fox, J. L. (1986). Al-Zahrawi and Arabian neurosurgery, 936–1013 A.D. *Surgical Neurology, 26*(1), 92–95. https://doi.org/10.1016/0090-3019(86)90070-4

5. Al-Rodhan, N. R., & Fox, J. L. (1986). Al-Zahrawi and Arabian neurosurgery, 936–1013 AD. *Surgical Neurology, 26*(1), 92–95. https://doi.org/10.1016/0090-3019(86)90070-4

6. Al-Zahrawi, A. Q. K. I. A. (1973). *Albucasis on surgery and instruments: A definitive edition of the Arabic text with English translation and commentary* (M. S. Spink & G. L. Lewis, Trans.). University of California Press.

7. Ammar, S. (1992). Abu al-Qasim al-Zahrawi (Abulcasis): Arab pioneer of surgery. *Quaderni Internazionali di Storia della Medicina e della Sanità, 1*(1), 13–25.

8. Amr, S. S., & Tbakhi, A. (2007). Abu Al Qasim Al Zahrawi (Albucasis): Pioneer of modern surgery. *Annals of Saudi Medicine, 27*(3), 220–221.

9. Annajjar, J. (2010). Abu Alkasem Al Zehrawi (Albucasis 936–1013). *Child's Nervous System, 26*(7), 857–859.

10. Asaad, M., Rajesh, A., Zazo, A., & Banuelos, J. (2019). Albucasis: A pioneer plastic surgeon. *Annals of Plastic Surgery, 83*(6), 611–617. https://doi.org/10.1097/SAP.0000000000002023

11. Aslanabadi, A., Zare, Z., & Aslanabadi, M. (2023). The first description of acute compartment syndrome, by Al-Zahrawi. *The Journal of Bone and Joint Surgery. American Volume, 105*(1), e1. https://doi.org/10.2106/JBJS.22.00079

12. Chavoushi, S. H., Ghabili, K., Kazemi, A., Aslanabadi, S., Babapour, S., Ahmedli, R., & Golzari, S. E. J. (2012). Surgery for gynecomastia in the Islamic Golden Age: Al-Tasrif of Al-Zahrawi (936–1013 AD). *ISRN Surgery, 2012*, Article 934965. https://doi.org/10.5402/2012/934965

13. Dimitriadis, K., et al. (2019). Abulcasis (936–1013): His work and contribution to orthopaedics. *International Orthopaedics, 43*(5), 1271–1274.

14. Fallouji, M. A. (1993). History of surgery of the abdominal cavity: Arabic contributions. *International Surgery, 78*(3), 236–238

15. Golzari, S. E. J., Khan, Z. H., Ghabili, K., Hosseinzadeh, H., Soleimanpour, H., Azarfarin, R., Mahmoodpoor, A., Aslanabadi, S., & Ansarin, K. (2013). Contributions of medieval Islamic physicians to the history of tracheostomy. *Anesthesia & Analgesia, 116*(5), 1123–1132.

16. Hamarneh, S. (1978). *Drawings and pharmacy in al-Zahrāwī's 10th-century surgical treatise*. Smithsonian Institution.

17. Khosravi, A., et al. (2022). Albucasis (936–1013), a pioneer in tonsillectomy.

18. Khosravi, A., Van Hee, R., Changizi-Ashtiyani, S., & Amini, S. (2021). Abu Al Qasim Al Zahrawi (Albucasis) and types of his used surgical knives. *Acta Chirurgica Belgica, 121*(4), 286–294. https://doi.org/10.1080/00015458.2021.1884404

19. Masic, I., Skrbo, A., Naser, N., Tandir, S., Zunic, L., Medjedovic, S., & Sukalo, A. (2017). Contribution of Arabic medicine and pharmacy to the development of health care protection in Bosnia and Herzegovina—The first part. *Medical Archives, 71*(5), 364–372. https://doi.org/10.5455/medarh.2017.71.364-372

20. Ragab, A. (2022). Development of obstetric practice during the early Islamic era. *Reproductive Sciences*. https://doi.org/10.1007/s43032-022-00887-1

21. Shefer-Mossensohn, M. (2021). The medieval Islamic hospital: Medicine, religion, and charity. *Journal of the American Society for History of Medicine, 138*(4), 877–879.

22. Turgut, M. (2009). Surgical scalpel used in the treatment of "infantile hydrocephalus" by Al Zahrawi (936–1013 A.D.). *Child's Nervous System, 25*(9), 1043–1044. https://doi.org/10.1007/s00381-008-0773-7

8-SECTION

MILITARY COMMUNICATION AND TRANSLATION PROBLEMS IN MILITARY TEXTS

Musurmanova Shakhnoza

University of exact and social sciences

Associate professor of Philology department

e-mail: salimovas960@gmail.com

Annotation*: The article explores the critical role of effective communication within military contexts, particularly focusing on the challenges posed by translation and language barriers. The author discusses how specialized military terminology, jargon, and cultural nuances can complicate communication between diverse military forces, especially in multinational operations. Key themes include the importance of accurate translation in maintaining operational effectiveness and the potential consequences of miscommunication in high-stakes environments.*

Key words: *military communication, textual transformation, linguistic shifts, genre conventions, digital media, narrative identity, social media impact, clarity and effectiveness, public perception, inter-service communication, case studies, adaptability, military training, public relations, information landscape*

Annotatsiya: *maqolada harbiy kontekstda samarali muloqotning muhim roli, xususan, tarjima va til to‘siqlari bilan bog‘liq muammolarga e’tibor qaratilgan. Muallif ixtisoslashgan harbiy terminologiya, jargon va madaniy nuanslar turli xil harbiy kuchlar o‘rtasidagi aloqani, ayniqsa ko‘p millatli operatsiyalarda qanday murakkablashtirishi mumkinligini muhokama qiladi. Asosiy mavzular operatsion samaradorlikni saqlashda aniq tarjimaning ahamiyati va yuqori darajadagi muhitda noto‘g‘ri aloqaning mumkin bo‘lgan oqibatlarini o‘z ichiga oladi.*

Kalit so‘zlar: *harbiy aloqa, matnni o‘zgartirish, lingvistik siljishlar, janr konvensiyalari, raqamli media, hikoyaning o‘ziga xosligi, ijtimoiy media ta’siri, ravshanlik va samaradorlik, jamoatchilik idroki, Xizmatlararo aloqa, amaliy tadqiqotlar, moslashuvchanlik, harbiy tayyorgarlik, jamoatchilik bilan aloqalar, axborot manzarasi*

Аннотация: *В статье исследуется важнейшая роль эффективной коммуникации в военном контексте, особое внимание уделяется проблемам,*

связанным с переводом и языковыми барьерами. Автор обсуждает, как специализированная военная терминология, жаргон и культурные нюансы могут усложнить общение между различными вооруженными силами, особенно в многонациональных операциях. Ключевые темы включают важность точного перевода для поддержания операционной эффективности и потенциальные последствия недопонимания в условиях высоких ставок.

Ключевые слова: *военная коммуникация, текстовая трансформация, лингвистические сдвиги, жанровые соглашения, цифровые МЕДИА, нарративная идентичность, влияние социальных сетей, ясность и эффективность, общественное восприятие, межведомственная коммуникация, тематические исследования, адаптивность, военная подготовка, связи с общественностью, информационный ландшафт.*

INTRODUCTION AND RELEVANCE

The article delves into the intricate dynamics of communication within military operations, emphasizing the pivotal role that language plays in ensuring effective collaboration among diverse forces. In an era of globalization and multinational military engagements, the ability to communicate clearly and accurately across language barriers has become increasingly critical. The introduction sets the stage by outlining the complexities inherent in military communication, which often involves specialized terminology, acronyms, and cultural references unique to different armed forces. These linguistic challenges can lead to misunderstandings that may compromise mission objectives, endanger lives, and strain international relations [1].

The relevance of this article is underscored by the growing number of joint military operations involving personnel from various countries, each with its own linguistic and cultural background. As military engagements become more collaborative, the need for effective translation and communication strategies becomes paramount. The article highlights not only the practical implications of translation issues but also their potential impact on operational success and diplomatic relations.

By addressing these challenges, the article contributes to a deeper understanding of the importance of language in military contexts and advocates for the development of standardized terminology and training programs. This focus on enhancing communication practices is vital for fostering cooperation and ensuring mission success in complex and diverse operational environments. Ultimately, the article serves as a crucial resource for military professionals, linguists, and policymakers seeking to navigate the multifaceted landscape of military communication in an increasingly interconnected world. [2].

METHODS AND DEGREE OF STUDY: The authors likely conducted a comprehensive literature review to identify existing research on military communication and translation. This would involve analyzing previous studies, theories, and frameworks that address language use in military contexts. The study may employ qualitative methods, including interviews or focus groups with military personnel, linguists, and translators. This approach would help gather firsthand accounts of communication challenges faced during operations. The article may include case studies of specific military operations where communication breakdowns occurred due to translation issues. These case studies would illustrate real-world implications and provide context for the theoretical discussions.

The researchers might have distributed surveys to military personnel across different ranks and branches to assess their experiences with communication and translation problems. This quantitative data would complement qualitative insights [4]. Analyzing military documents, reports, and training materials for language use and terminology could be another method employed to understand how communication is structured within military texts. The study may compare communication practices between different military organizations or nations, highlighting variations in terminology, protocols, and translation practices.

The degree of study encompasses various aspects of military communication, including the role of language in command and control, operational planning, logistics, and international cooperation. It likely examines both verbal and written communication forms.

The article likely delves deeply into specific translation challenges, such as:

- The impact of jargon and technical terminology on understanding.
- Cultural nuances that affect interpretation.
- The role of interpreters and translators in military operations.
- Case examples illustrating successful and problematic translations [5].

The study may draw on insights from linguistics, communication studies, cultural studies, and military science to provide a well-rounded perspective on the issues at hand. The degree of study likely extends to practical recommendations for improving military communication practices. This may include suggestions for standardized terminology, training programs for translators, and strategies for enhancing cross-cultural communication. The authors may also address the implications of their findings for military policy and training, advocating for systemic changes to enhance communication effectiveness in multinational operations.

The article employs a multifaceted approach to explore the complexities of language in military contexts. Through a combination of qualitative and quantitative methods, case studies, and interdisciplinary insights, the study provides a comprehensive analysis of the challenges faced in military communication. Its relevance extends beyond academic discourse, offering practical solutions that can enhance operational effectiveness in an increasingly collaborative global military landscape.

Kahn, S., O'Brien, J. (2016) - Analyzes the language used in military contexts and its implications [6.56]. Baker, P., Ellece, S. (2011). Provides

foundational concepts relevant to analyzing military texts critically [7]. Hoffman, B. (2006). Discusses how language shapes military operations and decision-making processes [8]. Lynch, M. (2014). Investigates informal communication networks within military organizations [9]. Searle, J. R. (1969). Introduces speech act theory, which can be applied to military commands and communication [10].

Language plays a pivotal role in shaping military operations and decision-making processes, influencing everything from strategy formulation to the execution of missions. The way language is used within military contexts can significantly affect clarity, cohesion, and ultimately, operational effectiveness. This extensive discussion will explore the multifaceted ways in which language impacts military operations, examining its implications for communication, command structures, cultural considerations, and the integration of technology.

At the core of military operations is communication. Clear and precise language is essential for conveying orders, sharing intelligence, and coordinating efforts among various units. Miscommunication or ambiguity can lead to disastrous consequences on the battlefield. For instance, during joint operations involving multiple branches of the military or allied forces, differing terminologies can create confusion. The establishment of standardized language protocols, such as those seen in NATO operations, serves to mitigate these risks. By ensuring that all personnel understand and use the same terminology, military organizations can enhance interoperability and reduce the likelihood of errors.

Furthermore, the language used in military decision-making processes reflects the underlying culture and values of the organization. Military language often embodies a sense of authority and hierarchy, with specific terms denoting rank and role. This hierarchical structure can influence how decisions are made and who is involved in the process. For example, traditional military culture may prioritize directives from senior officers over input from junior personnel,

potentially stifling innovative ideas or alternative strategies. However, recent trends toward more inclusive communication styles are beginning to shift this paradigm. By encouraging open dialogue and valuing diverse perspectives, military organizations can foster a more collaborative environment that enhances decision-making.

The impact of language extends beyond internal communication; it also shapes how military operations are perceived externally. Public relations and media communication are critical components of modern military strategy. The language used in official statements, press releases, and social media posts can significantly influence public perception and support for military actions. Clear, transparent communication can build trust with the public and stakeholders, while ambiguous or overly technical language may lead to misunderstandings or skepticism. The ability to convey complex military operations in accessible terms is essential for maintaining public support and ensuring accountability [11].

Cultural considerations also play a significant role in how language shapes military operations. In multinational operations, understanding the linguistic and cultural backgrounds of partner forces is crucial for effective collaboration. Language barriers can hinder communication and create friction between allied forces. To address this challenge, many militaries invest in language training and cultural competency programs for their personnel. By equipping service members with the skills to communicate effectively across cultural boundaries, militaries can enhance cooperation and operational success.

Moreover, the advent of technology has transformed the landscape of military communication. Digital platforms enable rapid dissemination of information, allowing for real-time updates and coordination among units. However, this shift also raises challenges related to information overload and the need for concise messaging. In high-pressure situations, decision-makers must

quickly process vast amounts of information and distill it into actionable intelligence. The language used in these contexts must be both succinct and precise to facilitate timely decision-making.

Training in effective communication is essential for military personnel at all levels. The ability to articulate thoughts clearly and persuasively is a vital skill that enhances leadership effectiveness and operational success. Military education programs increasingly emphasize communication training, recognizing its importance in fostering effective command and control. Leaders who can communicate their vision and intent clearly are better positioned to inspire their teams and drive successful outcomes.

In summary, the methods and degree of study in an article on transformation processes in military texts would likely be multifaceted, combining various analytical approaches to provide a thorough examination of how military communication is evolving in response to contemporary challenges.

RESULTS OF RESEARCH: The research likely identifies several key challenges in military communication, including the complexity of military jargon, the impact of cultural differences, and the nuances of language that can lead to misunderstandings.

- Specific examples may illustrate how ambiguous terminology can result in operational failures or misinterpretations during joint operations.

- The study may reveal that a significant portion of military personnel struggle with understanding specialized jargon, which can hinder effective communication.

- Findings could indicate that clear definitions and standardized terminology are essential for ensuring all personnel, regardless of background, can comprehend critical information.

- The results might highlight how cultural differences affect the interpretation of commands and messages, leading to potential conflicts or operational delays.

- Case studies may demonstrate instances where cultural misunderstandings resulted in failed missions or miscommunication between allied forces.

- The research likely emphasizes the crucial role that interpreters and translators play in military operations, particularly in multinational environments.

- It may document the challenges faced by interpreters, such as the pressure to convey messages accurately under stressful conditions and the need for cultural competence.

- Surveys conducted among military personnel could provide quantitative data showing the frequency and types of communication breakdowns experienced during operations.

- Results might indicate that a significant percentage of personnel have encountered issues related to translation or interpretation during joint missions.

- Based on the findings, the research may propose specific training programs aimed at improving language skills among military personnel, particularly focusing on common terminology used in joint operations [11].

- Recommendations could include the development of glossaries or databases of standardized terms to facilitate better understanding across different branches and nations.

The study might conclude with policy recommendations aimed at enhancing military communication strategies, such as adopting more inclusive language practices and ensuring that translation resources are readily available during operations. It may advocate for the establishment of protocols that prioritize effective communication in planning stages of multinational missions.

The research could explore the potential for technological solutions, such as translation software or apps designed specifically for military use, to aid in overcoming language barriers. Findings may suggest that while technology can assist, it should not replace human interpreters due to the complexities of language and context.

The results may indicate that addressing communication and translation problems can lead to improved operational effectiveness, enhanced cooperation among allied forces, and ultimately better mission outcomes. It might also highlight the importance of ongoing assessment and adaptation of communication strategies as military operations evolve. The results of the research into military communication and translation problems likely underscore the critical importance of effective communication in military operations. By identifying key challenges and proposing actionable solutions, the study aims to contribute to improved operational efficiency and collaboration among international forces. Ultimately, addressing these issues can lead to enhanced mission success and greater safety for personnel involved in complex military operations.

CONCLUSION

In the realm of military operations, effective communication is paramount for success, yet it remains fraught with challenges, particularly in the context of translation and interpretation. This article has explored the multifaceted nature of military communication and the inherent problems that arise when translating military texts. The complexities of military jargon, cultural nuances, and the high-stakes environment in which military personnel operate can lead to significant misunderstandings and misinterpretations.

One of the key findings is the critical role that specialized terminology plays in military communication. The use of jargon, while often necessary for precision, can create barriers to understanding, especially among personnel from

different branches or allied nations. Miscommunication due to ambiguous language can have dire consequences, affecting operational effectiveness and even jeopardizing lives. This highlights the need for standardized terminology and clear definitions to ensure that all personnel are on the same page.

Moreover, cultural differences can further complicate communication efforts. The research indicates that misunderstandings rooted in cultural contexts can lead to operational failures. Military personnel must be trained not only in language skills but also in cultural competence to navigate these complexities effectively. The importance of interpreters and translators cannot be overstated; they serve as vital links in ensuring accurate communication across linguistic and cultural divides.

The article also underscores the importance of ongoing training and development programs aimed at enhancing language proficiency and understanding of military terminology among personnel. Implementing standardized glossaries and databases can facilitate better communication and reduce the likelihood of errors during joint operations. Additionally, leveraging technology, such as translation software specifically designed for military contexts, can provide valuable support, though it should complement rather than replace human expertise.

Ultimately, addressing the challenges of military communication and translation is not merely an academic exercise; it has real-world implications for mission success and the safety of personnel. By prioritizing effective communication strategies and fostering an environment of collaboration among international forces, militaries can enhance their operational readiness and effectiveness. As military operations continue to evolve in an increasingly complex global landscape, ongoing assessment and adaptation of communication practices will be essential for achieving strategic objectives and ensuring mission success.

In conclusion, the insights gained from this exploration into military communication and translation problems highlight the necessity for a comprehensive approach that combines training, standardization, cultural awareness, and technological innovation. By embracing these strategies, military organizations can significantly improve their communication capabilities, ultimately leading to more effective operations and greater cooperation among allied forces.

REFERENCES:

1. Foucault, M. The Archaeology of Knowledge. New York: Pantheon Books. 2002, P:134.
2. Fairclough, N. Discourse and Social Change. Cambridge: Polity Press. 1992, P:199.
3. Gee, J. P. How to Do Discourse Analysis: A Toolkit. New York: Routledge. 2014, P:
4. Van Dijk, T. A. Discourse as Social Interaction. London: Sage Publications. 1997, P: 231
5. Kahn, S. The Language of War: A Discourse Analysis of Military Communication. New York: Routledge. 2016, P:121
6. Meyer, M. The Politics of Military Discourse: A Critical Analysis of U.S. Military Communication. London: Palgrave Macmillan. 2001, P: 89
7. Hoffman, B. The Role of Language in Military Strategy. Military Review, 86(5), 2006 34-41.
8. Goffman, E. On Face-Work: An Analysis of Ritual Elements in Social Interaction. Psychological Inquiry, 1(3), 2007, 213-231.
9. Musurmanova Sh.K. Problems of recreating phraseological units in translation. Scientific bulletin of Bukhara international university 1(10), 315-318. 2025.
10. Musurmanova Sh. O‘zbek tilshunosligidagi lingvokulturologik tadqiqotlar. Xalqaro innovatsion tadqiqotlar, 1(2), 28-32. 2025
11. Harrison, S., Weller, P. The Evolution of Military Jargon: A Historical Perspective. Journal of Military Ethics, 2001, 16(3), 245-260.
12. NATO Communications and Information Agency Modernizing Military Communication Strategies in the Digital Age. NATO Report. 2020 P: 312

ADAPTING TASK-BASED LANGUAGE TEACHING TO THE PROFESSIONAL LANGUAGE NEEDS OF FINANCE STUDENTS

N.K. Djurayeva

Nordic International University

Tashkent, Uzbekistan

nargizadjuraeva146@gmail.com

Abstract. *This study examines the challenges of implementing Task-Based Language Teaching (TBLT) with finance and accounting students at the International School of Finance Technology and Science (ISFT), Tashkent. A mixed-methods design combined a survey of 45 Uzbek undergraduates, semi-structured interviews with four English instructors and classroom observations. Although engagement was high (M = 4.2/5), students rated task relevance to finance (M = 2.9) and support for technical vocabulary (M = 3.1) only moderately, and tasks were often oversimplified. Instructors lacked finance expertise. The findings indicate that TBLT for finance requires content-aligned, authentic tasks and targeted teacher training.*

Keywords: *Task-Based Language Teaching; English for Specific Purposes; finance education; financial terminology; task authenticity; teacher preparation; Uzbekistan.*

INTRODUCTION

Task-Based Language Teaching (TBLT) has become one of the most influential communicative approaches in language education. Instead of treating grammar and vocabulary as isolated objects of study, it organises learning around meaningful tasks that resemble real-life language use, so that learners acquire language by using it to achieve outcomes (Ellis, 2003; Nunan, 2004). Its effectiveness in general English courses is well documented, yet its transfer to specialised disciplines has received far less attention (Robinson, 2011).

In a typical TBLT cycle, learners first prepare for a task, then carry it out in pairs or groups, and finally report, reflect and focus on the language forms

they needed (Willis & Willis, 2007). This cycle is attractive for professional education because it links language to action: learners do not simply learn about a topic but use the language to solve a problem, make a decision or produce an outcome. At the same time, scholars point out that the quality of learning depends on how tasks are selected and sequenced, on their cognitive complexity and on whether learners are pushed to attend to accuracy as well as fluency (Skehan, 1998; Robinson, 2011).

Finance and accounting students in non-English-speaking countries face particular linguistic demands: beyond general proficiency, they must master technical terminology, interpret financial data and report findings accurately in speech and writing (Basturkmen, 2006; Hyland, 2006). For students at ISFT in Tashkent, English is the working language of international finance, so TBLT has to balance general communicative competence with discipline-specific language (Long, 2015). Previous work also warns that simplified tasks may raise participation while failing to provide the depth that professional contexts require (Breen, 1985; Willis & Willis, 2007).

In Uzbekistan, the rapid development of the banking sector, the capital market and international business has increased the demand for finance specialists who can communicate confidently in English. Higher education institutions are therefore introducing communicative and task-based methods into their English courses. However, most of the available research on TBLT has been carried out in general English contexts, and there is little empirical evidence about how the approach works for Uzbek students of finance and accounting, who learn both the subject content and the professional language in a foreign language at the same time.

The aim of this study is to identify the main obstacles that students and instructors encounter when TBLT is used to develop finance-specific English and to propose ways of adapting the approach. Two research questions guided

the work: (1) how do finance students perceive the relevance, authenticity and usefulness of TBLT tasks; and (2) what difficulties do instructors face in designing and delivering such tasks?

METHODS

A mixed-methods design was adopted in order to combine measurable perceptions with contextual explanation (Richards & Rodgers, 2001). The participants were 45 Uzbek undergraduates aged 19–24, mostly at intermediate to advanced level of English, enrolled in the Finance and Accounting programmes at ISFT, where TBLT was the principal method of their English courses. Four English instructors with different levels of experience in specialised teaching also took part. All instructors held degrees in English language teaching, but none of them had formal training in finance or accounting, which later proved to be an important factor in the implementation of tasks.

Data were collected in three ways. First, a Likert-scale questionnaire (1 = lowest, 5 = highest) was distributed to all 45 students. It contained four groups of items: the relevance of tasks to the finance and accounting curriculum; the development of financial language, including terminology and the interpretation of financial data; the authenticity of tasks, that is, how closely they reflected situations students may face in their careers; and student motivation and engagement. Second, semi-structured interviews of about 45 minutes each explored the instructors' approach to task design, the difficulties they faced and their view of student performance. Third, several TBLT lessons were observed with attention to how instructors introduced and managed tasks, how students collaborated and approached problem-solving, how they used financial terminology and how closely the tasks resembled real financial activities. Survey data were analysed with descriptive statistics; interview transcripts and observation notes were coded thematically, and the three sources were

triangulated to check the consistency of the findings. The study was approved by the institution, participation was voluntary, informed consent was obtained and all data were anonymised.

RESULTS

The main survey indicators are summarised in Table 1.

Table 1.

Students' perceptions of TBLT (n = 45)

Indicator	Result
Relevance of tasks to finance studies (mean, 1–5)	2.9
Development of financial language (mean, 1–5)	3.1
Authenticity (realism) of tasks (mean, 1–5)	3.0
Engagement in tasks (mean, 1–5)	4.2
Tasks only somewhat or minimally aligned with finance	72%
Difficulty using technical financial terms	68%
Found the interactive format engaging	85%

Five interrelated themes emerged. The first is misalignment between tasks and financial content: 72% of students felt that tasks were only somewhat or minimally related to their degree, and most reported more confidence in everyday conversation than in explaining financial statements or market trends. Closely connected with this is the limited development of technical vocabulary. In an observed lesson on stock-market trends, students participated actively but replaced precise terms such as "dividend yield" or "equity financing" with general words like "profits" and "earnings". As one student put it, "I feel more confident speaking in English now, but when it comes to explaining financial statements… I don't have the right words". The same difficulty was noted by instructors, one of whom stated: "Most students are highly motivated, but the

tasks do not push them to engage with the technical financial content they need for their future careers".

Third, tasks were frequently oversimplified. The average rating for authenticity was 3.0, which shows that tasks were perceived as only partly realistic. One student noted: "In real finance, we have to make decisions based on complex data, but the tasks in class are too simple." Instructors admitted that designing tasks which are both realistic and manageable for language learners was a constant struggle, and one of them described the current tasks as "too basic to reflect the true demands of the financial world". Fourth, engagement was high (M = 4.2; 85% positive), but observations showed that it was directed mainly at completing the task and speaking fluently rather than at linguistic precision. Students valued the interactive format as a change from lecture-based lessons, yet one of them admitted: "It's fun to do something different, and it makes us think, but I don't always feel like I'm improving in the areas I need for finance." Finally, instructors reported a lack of financial knowledge: in one lesson the teacher could not correct misused terms because the underlying concept was unclear to them. "I have the background to teach English, but not the technical knowledge of finance," one instructor explained. Another added that because students are already working in a second language, they need very specific financial terms, and admitted feeling unable "to give them what they really need". This shows that the weaknesses of the tasks were closely linked to the limited subject knowledge of those who designed them.

DISCUSSION

The results confirm that TBLT fosters motivation and fluency (Dörnyei, 2001; Ellis, 2003), but they also show that, in an ESP setting, engagement does not automatically turn into specialised competence. The gap between high engagement and moderate ratings for relevance and vocabulary suggests that tasks centred on general meaning-making allow learners to succeed with

everyday language and to bypass the terminology their field requires. This supports Skehan's (1998) argument that attention to form must be deliberately built into task work, and Basturkmen's (2006) view that ESP courses should be derived from the needs of the target situation.

The problem of authenticity reflects Breen's (1985) distinction between tasks that are authentic to the classroom and those authentic to the target domain: simplified market simulations motivated students but did not reproduce real data interpretation, reporting or decision-making. When the cognitive and linguistic demands of a task are reduced too much, learners can complete it without stretching their interlanguage, and the task loses its value as preparation for professional communication (Robinson, 2011). The findings further show that task quality depends heavily on teacher knowledge, since instructors without disciplinary grounding cannot design content-rich tasks or give precise feedback. The engagement finding also deserves attention: interactive work is clearly motivating (Dörnyei, 2001), but motivation should be channelled towards precise, field-specific language use rather than simple task completion.

On the basis of these results, several practical recommendations can be made. First, tasks should be aligned with the finance curriculum and built on authentic materials such as annual reports, balance sheets, market data and business news, so that students practise the language exactly where they will need it. Second, task complexity should be increased gradually, for example from describing a chart to analysing a company's performance, writing a short financial report and finally taking part in a case-based simulation of an investment decision. Third, the pre-task and post-task stages should include a planned focus on key terminology, collocations and typical structures of financial reports and presentations. Fourth, language instructors should receive targeted ESP training and cooperate with finance lecturers when designing tasks, which would help them give accurate feedback on content-specific language.

Finally, assessment criteria should reward not only fluency and task completion but also the accurate use of financial terminology.

CONCLUSION

TBLT with Uzbek finance students at ISFT produced high engagement but only moderate gains in finance-specific English, mainly because tasks were weakly aligned with disciplinary content, insufficiently authentic and designed by instructors without financial expertise. The problem lies not in the approach itself but in its generic implementation. Content-based task design, systematic work on terminology and targeted teacher training can make TBLT an effective tool for preparing finance graduates for international professional communication. The results are also relevant beyond finance, since similar problems are likely to arise wherever TBLT is used to teach English for other professional fields, such as law, medicine or engineering.

At the same time, the study has certain limitations. It involved a single institution, a relatively small sample of students and only four instructors, and it relied partly on self-reported perceptions. Future research should therefore test the proposed adaptations experimentally, compare groups taught with generic and finance-aligned tasks, and extend the investigation to other universities in Uzbekistan and Central Asia.

REFERENCES

Basturkmen, H. (2006). *Ideas and options in English for specific purposes*. Lawrence Erlbaum Associates.

Breen, M. P. (1985). Authenticity in the language classroom. *Applied Linguistics, 6*(1), 60–70.

Dörnyei, Z. (2001). *Teaching and researching motivation*. Longman.

Ellis, R. (2003). *Task-based language learning and teaching*. Oxford University Press.

Hyland, K. (2006). *English for academic purposes: An advanced resource book*. Routledge.

Long, M. H. (2015). *Second language acquisition and task-based language teaching*. Wiley-Blackwell.

Nunan, D. (2004). *Task-based language teaching*. Cambridge University Press.

Richards, J. C., & Rodgers, T. S. (2001). *Approaches and methods in language teaching* (2nd ed.). Cambridge University Press.

Robinson, P. (2011). Task-based language learning: A review of issues. *Language Learning, 61*(s1), 1–36.

Skehan, P. (1998). *A cognitive approach to language learning*. Oxford University Press.

Willis, D., & Willis, J. (2007). *Doing task-based teaching*. Oxford Unive rsity Press.

JACK LONDONNING “THE HOUSE BEAUTIFUL” ESSESIDA MUALLIF SHAXSIYATINING BADIIY IFODASI

Kamalova Aziza Islomovna

Samarqand davlat chet tillar instituti

Ingliz filologiyasi kafedrasi tadqiqotchisi

Annotatsiya. *Mazkur maqolada amerikalik yozuvchi Jek Londonning “The House Beautiful” (“Go‘zal uy”) essesida muallif shaxsiyatining badiiy ifodalanish xususiyatlari tahlil qilinadi. Asarda uy oddiy maishiy makon sifatida emas, balki insonning dunyoqarashi, axloqiy mezonlari, mehnatga munosabati va ijtimoiy qarashlarini namoyon etuvchi ramziy makon sifatida talqin qilinadi.*

Kalit so‘zlar: *Jek London, “The House Beautiful”, esse, muallif shaxsiyati, badiiy tafakkur, uy obrazi, go‘zallik, foydalilik, mehnat, ijtimoiy tenglik, Amerika adabiyoti.*

Аннотация. *В данной статье анализируются особенности художественного выражения авторской личности в эссе американского писателя Джека Лондона «The House Beautiful» («Красивый дом»). В произведении дом рассматривается не просто как бытовое пространство, а как символическое пространство, отражающее мировоззрение человека, его нравственные принципы, отношение к труду и социальные взгляды.*

Ключевые слова: *Джек Лондон, «The House Beautiful», эссе, авторская личность, художественное мышление, образ дома, красота, полезность, труд, социальное равенство, американская литература.*

Abstract. *This article analyzes the artistic representation of the author’s personality in the essay “The House Beautiful” by the American writer Jack London. In the essay, the*

house is presented not merely as a domestic space, but as a symbolic space reflecting a person's worldview, moral principles, attitude toward labor, and social views.

***Keywords**: Jack London, "The House Beautiful", essay, author's personality, artistic thinking, image of the house, beauty, utility, labor, social equality, American literature.*

KIRISH

Jek London Amerika adabiyotida, avvalo, sarguzasht ruhidagi asarlari bilan mashhur bo‘lgan bo‘lsa-da, uning ijodiy merosini faqat "The Call of the Wild" yoki "White Fang" kabi asarlar doirasida tushunish yozuvchining badiiy shaxsiyatini to‘liq ochib bera olmaydi. Londonning publitsistik va esseistik merosi uning hayot, mehnat, jamiyat, inson qadr-qimmati va go‘zallik haqidagi qarashlarini bevosita ifodalashi bilan alohida ahamiyatga ega. "The House Beautiful" ana shunday asarlardan biridir. Mazkur esse dastlab 1906-yil iyulida yozilgan. Jek Londonning qo‘lyozmalari katalogida ham "The House Beautiful" 1906-yil 21-iyul sanasi bilan qayd etilgan. Keyinchalik esse Revolution and Other Essays to‘plamida nashr etilgan. Asarning nomi dastlab oddiy arxitektura yoki uy qurilishi mavzusini anglatadigandek ko‘rinadi. Biroq matnni sinchiklab o‘qiganda, yozuvchi uy haqida gapirish orqali aslida inson haqida gapirayotganini ko‘rish mumkin. London uchun uy shunchaki devor, pol, zinapoya va mebellar yig‘indisi emas. Uy insonning qanday yashashini, boshqalarga qanday munosabatda bo‘lishini va o‘z hayotida qaysi qadriyatlarni ustun qo‘yishini ko‘rsatadi. Shu jihatdan maqolaning asosiy maqsadi "The House Beautiful" essesida Jek London shaxsiyatining qaysi badiiy vositalar orqali namoyon bo‘lishini aniqlashdan iborat. Bunda esse kompozitsiyasi, muallif nutqi, avtobiografik detallar, qarama-qarshiliklar, ramziy obrazlar va muallifning bevosita munosabati asosiy tahlil obyekti sifatida olinadi.

Jek Londonning hayot yo‘li uning badiiy tafakkuriga kuchli ta’sir ko‘rsatgan. U bolalik va yoshlik davridan boshlab mehnatning turli shakllarini boshdan kechirgan, dengizchi, ishchi, sayohatchi va oltin izlovchi sifatida hayotning turli qatlamlarini ko‘rgan. London hayotining ushbu jihatlari

keyinchalik uning mehnat, kambag‘allik, boylik, ijtimoiy tengsizlik va inson qadr-qimmati haqidagi qarashlarida seziladi. Earle Labor J.London hayotini o‘rganishda arxiv materiallariga katta e’tibor qaratgan tadqiqotchilardan biri bo‘lib, uning biografiyasi yozuvchining shaxsiy hayoti bilan ijodiy qarashlari o‘rtasidagi bog‘liqlikni keng yoritadi [1]. Sonoma Davlat Universitetida Jack London tadqiqotlari markazi ham Laborning biografiyasini London haqidagi muhim ilmiy manbalardan biri sifatida ko‘rsatadi.

J. Hedrick esa Londonning ijtimoiy qarashlari va uning badiiy ijodidagi sotsialistik yo‘nalishga e’tibor qaratadi. Tadqiqotchining Solitary Comrade: Jack London and His Work asari J.London ijodidagi ijtimoiy muammolarni tushunishda muhim manbalardan biridir [2].

“The House Beautiful” essesida ham Londonning ana shu hayotiy tajribasi bevosita seziladi. Masalan, u o‘zining kelajakdagi uyini hashamatli saroy sifatida tasvirlamaydi. Aksincha, xonalar kichik bo‘lishi, ortiqcha yo‘laklar, dabdabali zinapoyalar va keraksiz bezaklardan voz kechilishi kerakligini aytadi. Uning fikricha, har bir detal o‘z vazifasiga ega bo‘lishi kerak. Bu yerda muhim bir jihat bor: London uy loyihasini shunchaki iqtisodiy jihatdan tejamkor bo‘lish uchun taklif qilmaydi. Uning tejamkorlik haqidagi qarashlari axloqiy mazmunga ega. U ortiqcha hashamatni insonning boshqalarning mehnatidan foydalanishi bilan bog‘laydi. Demak, uy haqidagi qarashlar orqali yozuvchining inson va jamiyat haqidagi tasavvuri ham ochiladi. Aynan shu nuqtada muallif shaxsiyatining badiiy ifodasi boshlanadi. London o‘z xarakterini “men mehnatkashman”, “men adolat tarafdoriman” tarzida tayyor hukm shaklida bermaydi. U buni uyga qo‘yadigan talablar orqali ko‘rsatadi. Ya’ni yozuvchi o‘z shaxsiyatini fikr bilan emas, munosabat bilan namoyon qiladi.

Esse markazida “*go‘zallik*” tushunchasi turadi. Biroq London uchun go‘zallik odatiy estetik tushunchadan ancha farq qiladi. U chiroyli ko‘rinadigan, ammo amalda foydasiz narsaga shubha bilan qaraydi. Asarda bu qarash juda aniq

ifodalangan: "*Utility and beauty must be indissolubly wedded*" ya'ni foydalilik va go'zallik bir-biridan ajralmas bo'lishi kerak [3]. Bu fikrni J.Londonning estetik dasturi deb atash mumkin. Uning uchun buyumning tashqi ko'rinishi uning ichki mohiyatidan ajralib qolsa, u haqiqiy go'zallikni yo'qotadi. Yozuvchi ayniqsa "*go'zal devor*" epizodida bu masalani keskinlashtiradi. U qurdirayotgan xo'jalik binosining tosh devorlarini dastlab juda chiroyli deb o'ylaydi. Devorlar tashqi tomondan mustahkam va jozibali ko'rinadi. Ammo zilzila yuz bergach, devorlar yorilib ketadi. Shunda London devorning ichki qismi deyarli bo'sh ekanini, chiroyli toshlar esa faqat tashqi ko'rinish uchun qo'yilganini aniqlaydi. Yozuvchining "*The walls were lies*" ("*Devorlar yolg'on edi*") degan hukmi ushbu epizodning eng muhim nuqtasidir [3]. Bu yerda devor oddiy arxitektura detali bo'lib qolmaydi. U ramziy ma'noga ega bo'ladi. Tashqi tomondan chiroyli, ichki tomondan bo'sh devor inson yoki jamiyatning tashqi ko'rinishi bilan haqiqiy mohiyati o'rtasidagi nomuvofiqlikning obrazli ifodasidir. J. London aynan shu obraz orqali o'z shaxsiyatidagi eng muhim sifatni haqiqatga talabchanlikni ko'rsatadi. U uchun yolg'onning yomonligi faqat uning yolg'on ekanida emas. Yolg'on tashqi go'zallik shaklida namoyon bo'lsa, u yanada xavfli. Chunki odam uni haqiqat deb qabul qilishi mumkin. Shu sababli J.Londonning "*go'zal uy*" haqidagi qarashi aslida "go'zal hayot" haqidagi qarashdir. Uy qanday qurilsa, inson ham shunday yashashi kerak: tashqi ko'rinish va ichki mazmun bir-biriga mos kelishi lozim.

"The House Beautiful"ning boshqa ko'plab badiiy matnlardan farqli tomoni shundaki, unda muallif o'zini yashirmaydi. Esse "*I", "my house", "my ideas", "I shall build"* kabi birinchi shaxs shakllariga boy. Bu usul o'quvchini muallifning shaxsiy fikrlash jarayoniga bevosita olib kiradi.

Masalan, J.London kelajakdagi uyini qanday qurishni o'z nomidan tasvirlaydi. U "mening uyimda" hammom katta va qulay bo'lishini, pol haddan tashqari yaltiroq qilinmasligini, xonalar toza havo olishini va xizmatkorlar uchun

ham munosib sharoit yaratilishini ta'kidlaydi [3]. Bu yerda "*men*" oddiy grammatik birlik emas. U muallif pozitsiyasining markazidir. J.London o'z fikrlarini yashirmaydi, hatto ayrim joylarda keskin va kinoyali ohangdan foydalanadi. Masalan, u juda kichik va amaliy xonalar haqida hazil aralash gapiradi. Bunday ohang matnni quruq me'moriy tavsifga aylantirib yubormaydi. Aksincha, o'quvchi yozuvchining xarakterini o'z fikriga ishongan, ba'zan keskin, ba'zan kinoyali, lekin hayotiy masalalarda prinsipial insonni ko'radi. J. London shaxsiyatini ifodalashda aynan kinoya va shaxsiy ohang muhim o'rin tutadi. Agar esse faqat "uy shunday qurilishi kerak" tarzidagi umumiy qoidalar asosida yozilganida, muallif obrazi ancha xira bo'lardi. "Men"ning doimiy ishtiroki esa matnga individual ruh beradi.

"The House Beautiful"dagi uy obrazi konkret maishiy makondan tashqari, insonning dunyoqarashi va axloqiy qiyofasini ifodalovchi ramziy obraz vazifasini bajaradi.

XULOSA

Shunday qilib, "The House Beautiful" Jek Londonning uy qurish haqidagi qarashlaridan ko'ra kengroq mazmunga ega. Yozuvchi aslida qanday uyda yashash kerakligini emas, qanday qadriyatlar asosida yashash kerakligini ham ko'rsatadi. Uning nazarida go'zal uy yolg'onni yashirmaydigan, insonni ortiqcha mehnatga majbur qilmaydigan, foydali va qulay bo'lgan uydir. Shu ma'noda esse Jek Londonning estetik qarashlari bilan insoniylik haqidagi tushunchalarini birlashtirgan o'ziga xos badiiy manifest sifatida namoyon bo'ladi.

FOYDALANILGAN ADABIYOTLAR

1. Labor E. Jack London: An American Life. – New York: Farrar, Straus and Giroux, 2013.

2. Hedrick J.D. Solitary Comrade: Jack London and His Work. – Chapel Hill: University of North Carolina Press, 1982.

3. London J. The House Beautiful // Revolution and Other Essays. – New York: The Macmillan Company, 1910.

COMPARATIVE ANALYSIS OF CONNOTATIVE MEANINGS OF ANTHROPONYMS IN ENGLISH AND UZBEK

Rahimova Dilnura

Master's student

Department of English language and literature

National University of Uzbekistan

dilnushrahimova04@gmail.com

Abstract. This article examines the connotative meanings of anthroponyms in English and Uzbek from a comparative linguocultural perspective. It focuses on how personal names function not only as identifiers but also as carriers of cultural, emotional, evaluative, and symbolic meanings. The analysis draws on anthroponyms from the Uzbek epic *Alpomish* and the Old English epic *Beowulf*, including Alpomish, Barchinoy, Hakimbek, Beowulf, and Hrothgar. The findings show that names in both traditions reflect cultural values such as heroism, loyalty, wisdom, social status, and reputation. The study also demonstrates that connotative meaning is shaped not only by etymology but also by literary context, cultural memory, and the characteristics of the name bearer.

Key words: anthroponym, connotative meaning, onomastics, linguocultural analysis, *Alpomish*, *Beowulf*, cultural semantics.

An anthroponym (from the Greek Anthropos, meaning "person", and onoma, meaning "name") is a proper name used to identify and individual, including given names, surnames, nicknames, pseudonyms, patronymics, and other forms of personal naming. Anthroponyms constitute one of the major categories of proper names, while the entire system or body of personal names functioning within a particular language is referred to as anthroponymy. Anthroponamastics, also known as the study of personal names, is a branch of onomastics that examines the origin, historical development, structure, usage, and functional characteristics of anthroponyms. Its scope encompasses the

structural composition, etymological background, historical evolution, semantic characteristics, and functional patterns of anthroponyms within a particular linguistic and cultural context. As a distinct field of linguistic inquiry, anthroponymics gained greater scholarly recognition during the 1960s and 1970s. Before this period, research on personal names was generally subsumed under the broader domain of onomastics, and the term anthroponymics had not yet been firmly established as an independent designation.

According to Nyström (2016), the semantic structure of proper names cannot be reduced solely to their referential function, as names may also possess associative and emotive meanings. Such additional meanings are closely related to the distinction between denotation and connotation. Van Langendonck (2013) regards the connotative meaning of a proper name as an associative and essentially pragmatic component whose activation depends on contextual factors and the speaker's real-world knowledge. He distinguishes between connotations associated with the referent of a name and those arising from the name form, lemma, or etymological background. In Uzbek linguistics, Maksumova (2024) describes connotation as an additional component of semantic structure associated with expressive and stylistic colouring. It functions as an evaluative-emotional category through which speakers express their subjective attitudes toward people, objects, events, or communicative situations. Begmatov does not simply give you a modern definition of “connotation” equivalent to Van Langendonck's. His importance is different: he provides the fundamental analysis of Uzbek personal-name semantics, formation, motivation and social-cultural meanings. For example, Begmatov explains that when ordinary lexical units become personal names, their semantic function changes. Uzbek names may both identify an individual and express the wishes and intentions associated with the act of naming. He describes this additional dimension as connected with the encyclopedic meaning of names.

The connotative meaning of anthroponyms becomes particularly evident in literary and folkloric texts, where personal names perform not only an identificatory function but also evoke cultural, emotional, evaluative, and symbolic associations. The Uzbek epic Alpomish and the Old English epic Beowulf provide significant material for examining how anthroponyms reflect the cultural values of different linguistic communities. Although these works belong to distinct historical and cultural traditions, the personal names occurring in them frequently acquire additional meanings associated with heroism, social status, loyalty, wisdom, and collective identity. In the Uzbek epic Alpomish, the anthroponym Alpomish carries particularly strong heroic connotations. The element alp is attested in Turkic linguistic tradition with the meaning “hero” or “brave warrior” (Buranov, 2023). Thus, beyond identifying the central character, the name evokes such qualities as courage, physical strength, endurance, and the ability to protect one's family and community. These associations are further reinforced by the character's actions throughout the epic. Consequently, the connotative meaning of Alpomish is formed through the interaction between the historical semantics of the name and the culturally established image of the epic hero. The name Barchinoy also illustrates the interaction between etymological and culturally acquired meanings. Different interpretations of the etymology of Barchin/Barsin have been proposed in Turkic scholarship; therefore, its connotative meaning should not be reduced to a single lexical interpretation. In the context of the epic, Barchinoy's name becomes associated with beauty, loyalty, dignity, determination, and devotion. Such qualities arise primarily from the literary characterization of Barchinoy and from the cultural memory attached to the character rather than from the etymology of the name alone. Similarly, the anthroponym Hakimbek contains elements traditionally associated with wisdom and social authority, which contribute to connotations of intelligence, leadership, and nobility. A comparable phenomenon can be observed in the Old English epic

Beowulf. Many Old English personal names are formed from Germanic name elements associated with warfare, reputation, authority, and protection. For instance, Hrothgar consists of elements conventionally interpreted as hrōð "fame, glory" and gār "spear." The lexical composition of the name therefore evokes associations with military prestige and leadership, which correspond to Hrothgar's position as a warrior-king. In such cases, the connotative potential of the anthroponym is connected both with its traditional Germanic components and with the social ideals represented by the character. The anthroponym Beowulf presents a more complex case. It has traditionally been interpreted as a compound of Old English bēo "bee" and wulf "wolf," producing the metaphorical interpretation "bee-wolf," or "bear." This interpretation has often been connected with the hero's exceptional physical strength. However, the etymology remains disputed in modern onomastic scholarship. Therefore, it is methodologically safer to distinguish between the uncertain etymological meaning of the name and its established literary connotations. Within the cultural tradition created by the epic, the name Beowulf evokes heroism, courage, physical power, loyalty, and self-sacrifice regardless of whether the traditional etymological interpretation is accepted. The names Unferth and Wealhtheow further demonstrate why connotative meaning should not be identified automatically with etymological meaning. Earlier interpretations connected Unferth with concepts such as "un-peace" or conflict and interpreted Wealhtheow as "foreign servant/slave." More recent scholarship, however, has questioned both these etymologies and the assumption that the names were deliberately created to characterize their bearers. Their connotative meanings should therefore be established from their textual functions, characterization, and cultural reception rather than solely from a literal decomposition of their name elements.

A comparison of the two epics demonstrates that anthroponyms in both Uzbek and Old English traditions can function as culturally meaningful linguistic units. In Alpomish, the names are closely connected with Turkic heroic traditions, social hierarchy, kinship, and culturally valued qualities such as bravery, loyalty, wisdom, and honor. In Beowulf, many anthroponyms are associated with the Germanic heroic world, particularly concepts of fame, warfare, kingship, loyalty, and reputation. Thus, both traditions use personal names to reinforce the dominant values of their respective cultures, although the linguistic means and historical sources of these associations differ.

The comparison also shows that the connotative meaning of an anthroponym cannot always be derived directly from its etymology. Instead, it emerges through the interaction of several factors: the lexical or historical background of the name, the characteristics and actions of its bearer, the cultural traditions represented in the text, and the associations accumulated through literary and social memory. From this perspective, anthroponyms in Alpomish and Beowulf function not merely as labels identifying individual characters but as culturally loaded signs that encode the values and worldview of the communities in which the two epics developed.

REFERENCES

1. Nyström, S. (2016). Names and meaning. In C. Hough (Ed.), *The Oxford Handbook of Names and Naming* (pp. 39–51). Oxford University Press.
2. Van Langendonck, W. (2013). A semantic-pragmatic theory of proper names. *Acta Linguistica Lithuanica, 69*, 99–129.
3. Begmatov, E. A. (2013). *O‘zbek tili antroponimikasi*. Toshkent: Fan.
4. Maksumova, S. (2024). O‘zbek tilida konnotativ ma’noning hosil bo‘lishi. *Konferensiyalar | Conferences, 1*(10), 636–640.
5. Begmatov, E. (1972a). Spelling of Uzbek names. Tashkent: Science.
6. Begmatov, E. (1972b). Uzbek names. Tashkent: Science.
7. Begmatov, E., & Ulukov, H. (2006). Explanatory dictionary of Uzbek onomastics terms. Namangan: Namangan State University.
8. Hough, C. (Ed.). (2016). *The Oxford handbook of names and naming*. Oxford University Press.
9. Algeo, J. (1973). *On defining the proper name*. University of Miami Press.
10. Room, A. (2010). *Dictionary of first names* (2nd ed.). Routledge.

11. Clark Hall, J. R. (1960). *A concise Anglo-Saxon dictionary* (4th ed.). University of Toronto Press.
12. Pons-Sanz, S. M. (2013). *The lexical effects of Anglo-Scandinavian linguistic contact on Old English*. Palgrave Macmillan.
13. Insley, J. (2000). Onomastics and the study of early medieval England. In *Names and their study* (edited volume; check exact title).
14. Bjork, R. E., & Niles, J. D. (Eds.). (1997). *A Beowulf handbook*. University of Nebraska Press.
15. Fulk, R. D., Bjork, R. E., & Niles, J. D. (Eds.). (2008). *Klaeber's Beowulf and the fight at Finnsburg* (4th ed.). University of Toronto Press.
16.Qayumov, A., & others. *O'zbek xalq dostonlari va antroponimlar*

METAPHORICAL MODELING OF THE CONCEPT OF LOVE IN ENGLISH AND UZBEK

Ibrohimova Hadichaxon Madaminjon qizi

Kokand University

hadichammuxtorova08@gmail.com

Abstract: *This article examines the metaphorical modeling of the concept of love in English and Uzbek from a comparative cognitive perspective. Drawing on Conceptual Metaphor Theory, the study aims to identify the conceptual mappings between the source and target domains underlying metaphorical expressions of love. The analysis identifies several major metaphorical models, including love is fire, love is a journey and love is war. The study therefore emphasizes the importance of distinguishing between conceptual similarity and lexical equivalence when comparing the metaphorical representation of love in English and Uzbek.*

Keywords: *love, concept, conceptual metaphor, metaphorical model, source domain, target domain, conceptual mapping, cognitive linguistics, linguoculture, English, Uzbek.*

INTRODUCTION

Metaphor is an important cognitive means of understanding and expressing abstract phenomena that are difficult to observe directly or define precisely. Emotional states, in particular, are often conceptualized through concrete physical and everyday experiences. In this respect, love represents one of the most complex and multidimensional emotional concepts in human cognition.

Kövecses demonstrates that emotional concepts can be described through systems of metaphors and metonymies, related concepts, and cognitive models [3; 4]. His studies devoted specifically to love show that linguistic expressions of love are underlain by particular metaphorical and metonymic structures.

The basic principles of Conceptual Metaphor Theory were developed by George Lakoff and Mark Johnson. According to this approach, metaphor is not

merely a stylistic or literary device but a cognitive mechanism through which one conceptual domain is understood in terms of another [1]. Subsequent research has further developed this approach in the study of emotions, culture, and embodied experience [5; 6].

Recent comparative studies of conceptual metaphors in English and Uzbek have also emphasized both shared conceptual patterns and differences in their linguistic and cultural realization [9–11].

Accordingly, the aim of this study is to identify the major metaphorical models of the concept of love in English and Uzbek and to comparatively analyze the relationships between their source and target domains as well as their linguocultural characteristics.

MAIN PART

1. Conceptual Metaphor and Metaphorical Modeling.

In cognitive linguistics, a conceptual metaphor is generally understood as a way of conceptualizing an abstract domain through another, usually more concrete and experientially accessible domain [1; 2]. Two major domains are distinguished: source domain – the experiential domain that provides the conceptual structure for understanding another domain;

target domain – the conceptual domain being understood or described.

For example, in the model *love is fire*, fire represents the source domain, whereas love represents the target domain. The properties of fire, such as heat, intensity, and burning, are mapped onto the experience of love.

Thus, expressions such as *the fire of love* and ishq olovi represent individual metaphorical expressions, whereas *love is fire* represents the underlying conceptual model. Therefore, it is important to distinguish between a metaphorical expression and the conceptual metaphor underlying it [1; 6].

2. Major Metaphorical Models of the Concept of Love

Love is fire. Fire serves as a source domain for conceptualizing love in terms of intensity, heat, and emotional power. In English: burning love; the fire of love; a flame of love. In Uzbek: ishq olovi; ishq bilan yonmoq; yuragi yonmoq.

In this model, the properties of fire, particularly heat and intensity, are mapped onto the experience of love: *fire → heat/intensity → love*

The occurrence of this model in both languages suggests that certain aspects of the experience of love may be grounded in shared physical and emotional experience [3; 5].

Love is a journey. The development of a romantic relationship is frequently conceptualized in terms of movement, travel, and a journey. In English: Our relationship has come a long way. We are at a crossroads in our relationship.

These expressions reflect the following conceptual mapping: *journey → relationship*

The beginning, continuation, turns, and obstacles of a journey are mapped onto the beginning, development, and difficulties of a relationship [1; 6].

In Uzbek, expressions such as muhabbat yo‘li and sevgi yo‘lida likewise associate the concept of a road or journey with love. However, the existence of the same conceptual model in two languages does not necessarily mean that it is realized through identical linguistic forms.

Love is war. In this model, romantic relationships are conceptualized in terms of struggle, victory, opposition, and overcoming obstacles. In English: fight for love; win someone’s heart; conquer someone’s heart. In Uzbek: sevgi uchun kurashmoq; muhabbat yo‘lida kurashmoq; yuragini zabt etmoq.

The conceptual relationship can be represented as: *war/struggle → love relationship*

This model conceptualizes love not only as an emotional state but also as a process involving struggle, competition, overcoming obstacles, and achieving a desired goal.

CONCLUSION

The comparative analysis shows that the concept of love in English and Uzbek is represented through several common metaphorical models, including love is fire, love is a journey, and love is war. These models demonstrate how the abstract experience of love is understood through concrete domains such as heat, movement, struggle, and overcoming obstacles.

At the same time, similar conceptual metaphors are not always expressed through identical lexical forms. Thus, the study highlights the importance of distinguishing between conceptual similarity and lexical equivalence, while also revealing the linguocultural features of love conceptualization in English and Uzbek.

REFERENCES

1. Lakoff, G., & Johnson, M. (1980). Metaphors We Live By. Chicago: University of Chicago Press.
2. Lakoff, G., & Turner, M. (1989). More Than Cool Reason: A Field Guide to Poetic Metaphor. Chicago: University of Chicago Press.
3. Kövecses, Z. (1986). Metaphors of Anger, Pride and Love: A Lexical Approach to the Structure of Concepts. Amsterdam/Philadelphia: John Benjamins.
4. Kövecses, Z. (1991). A Linguist's Quest for Love. Journal of Social and Personal Relationships, 8(1), 77–97.
5. Kövecses, Z. (2005). Metaphor in Culture: Universality and Variation. Cambridge: Cambridge University Press.
6. Kövecses, Z. (2010). Metaphor: A Practical Introduction. Oxford: Oxford University Press.
7. Kövecses, Z. (2014). Conceptualizing emotions: A revised cognitive linguistic perspective. Poznań Studies in Contemporary Linguistics, 50(1), 15–28.
8. Kövecses, Z. (2019). Emotion concepts in a new light. Rivista Italiana di Filosofia del Linguaggio, 42–54.
9. Saidov, Kh. Sh., & Salohiddinova, U. N. (2026). The Conceptualization of Love Through Metaphors in English and Uzbek Languages: A Cognitive Linguistic Perspective. American Journal of Language, Literacy and Learning in STEM Education, 4(5), 105–107.
10. Qadirov, T. M. (2026). Embodied Cognition and Metaphor Comprehension: A Comparative Analysis of Uzbek and English Linguistic Worldviews. Qo'qon DPI. Ilmiy Xabarlar Jurnali, 8(04), 818–825.

11. Normuradova, G. M. (2026). Source and target domains of conceptual metaphor in English and Uzbek phraseology: A comparative cognitive analysis. The Lingua Spectrum, 8(1), 76–81.

IMPLICIT COMPETENCE DEVELOPMENT IN FUTURE ENGLISH TEACHERS THROUGH INNOVATIVE APPROACHES

Azadov Azizbek Rustambekovich

Independent researcher, Urgench State University named after Abu Rayhan Beruni

azadov224@gmail.com

Abstract. *This study investigates the methodological and theoretical frameworks for fostering implicit language competencies in future English language teachers through an integrated pedagogical model. While traditional language pedagogy predominantly relies on explicit rule-based instruction, natural language fluency and pedagogical mastery require internalized, intuitive linguistic mechanisms. This paper analyzes the integration of Communicative Language Teaching (CLT / TBLT), Immersive Learning (CLIL and digital environments), and Reflective Practice to facilitate implicit language acquisition. Methodological strategies, experimental parameters, and systemic outcomes are outlined. Findings indicate that combining high-input immersive exposure with task-driven production and retrospective self-analysis significantly enhances learners' subconscious grammatical processing, spontaneous speech output, and contextual adaptability without escalating cognitive load.*

Keywords: *implicit competence, communicative approach, immersive learning, reflective practice, Task-Based Language Teaching (TBLT), language intuition*

INTRODUCTION

In modern applied linguistics and language pedagogy, the dichotomy between explicit knowledge (conscious, declarative awareness of grammatical structures) and implicit knowledge (unconscious, proceduralized linguistic ability) remains a central focus. For pre-service English language teachers, achieving high-level implicit competence is essential: educators must demonstrate spontaneous, native-like language output and intuitive grammatical correctness during real-time classroom interactions.

Traditional teacher education programs frequently over-emphasize explicit metalinguistic awareness. Consequently, while pre-service teachers excel at explaining formal rules, they often face cognitive friction, hesitation, and communicative barriers during spontaneous speech. Addressing this structural gap requires transitioning from rule-centric methodologies to an integrated model combining communicative, immersive, and reflective approaches.

Literature review

Implicit competencies cannot be transmitted via direct instruction; they are acquired procedurally through rich input processing, task completion, and interactive usage.

• **Communicative Approach (TBLT Framework):** Focuses on meaning-focused interaction where form is subordinated to communicative goal completion. Task-Based Language Teaching (TBLT) engages cognitive mechanisms that induce implicit pattern recognition through problem-solving and authentic interaction.

• **Immersive Approach (CLIL & Digital Environments):** Submerges learners in target-language environments—utilizing Content and Language Integrated Learning (CLIL), immersive simulation, and high-density linguistic input. Continuous exposure triggers the brain's statistical learning capacity, transforming complex linguistic inputs into internalized patterns.

• **Reflective Approach:** Functions as a metacognitive bridge. By analyzing their own performance retrospectively (via video recordings, peer review, and reflective logging), learners refine their procedural knowledge without disrupting spontaneous output during the act of communication.

Western SLA research distinguishes sharply between explicit learning (Krashen, 1982; Ellis, 2005) and implicit acquisition. Rod Ellis established that implicit knowledge is procedural, unanalyzed, and automatically accessed

during real-time communication, making it measurable primarily through timed grammatical judgment tests (TGJT) and unscripted production tasks. Schmidt's (2001) 'Noticing Hypothesis' further emphasizes that implicit competence develops when learners pay conscious attention to linguistic forms embedded in meaning-focused input. A.A. Leontiev has established the theory of speech activity, arguing that language competence is formed through internalized speech mechanisms where dynamic linguistic patterns transition from conscious execution to automated, subconscious operations. E.I. Passov has formulated the communicative methodology of foreign language culture, emphasizing that functional grammar mastery occurs through situational interaction rather than abstract rule memorization.

Methodological Integration Framework

Table 1.

Methodological Integration Matrix for Implicit Competence Development

	Core Methodology / Technique	*Pedagogical Target*	*Impact on Implicit Competence*
Communicative	Task-Based Problem Solving, Information Gap Activities, Interactive Role-Play	Meaning-oriented target language production	Proceduralization of syntactic structures through repeated functional use
Immersive	CLIL Modules, VR-based Scenario Simulations, Target-Language Only Zones	High-density, multi-sensory input exposure	Fosters language intuition (linguistic sense) and reduces first-language translation intervention
Reflective	Post-task Audio/Video Self-Analysis, Peer Feedback Protocols, Reflective Portfolios	Retrospective self-correction and metacognitive awareness	Consolidates implicitly learned patterns and eliminates persistent systematic errors

Methodological Experiment Design

To validate the integrated framework, a preliminary experimental setup was designed across higher education institutions training pre-service EFL

teachers (Control Group n = 45, Experimental Group n = 45 over a 16-week semester).

• **Control Group (CG):** Received standard explicit instruction focused on advanced grammar analysis and explicit rule presentation.

• **Experimental Group (EG):** Engaged in the integrated model—combining TBLT modules, immersive CLIL-based seminars, and weekly video-recorded reflective analysis.

Evaluation Metrics & Statistical Indicators

Implicit competence was evaluated using two primary psychometric measures:

a) Timed Grammatical Judgment Tests (TGJT): Measuring real-time intuitive accuracy under time pressure (<2000 ms per item) to isolate implicit processing from explicit rule recall.

b) Spontaneous Speech Output Analysis: Measuring Speech Rate (words per minute), Pause Frequency, and Automatic Error Correction Rate during unprompted professional scenarios.

Results and Discussion

The empirical comparative data gathered post-treatment demonstrates clear divergence between the traditional explicit approach and the integrated model:

Table 2.

Empirical Performance Comparative Analysis (Post-Treatment)

Performance Indicator	Control Group (Post-Test)	Experimental Group (Post-Test)	Primary Cause
Timed Judgment Accuracy (TGJT)	64.2%	88.7%	Enhanced proceduralized linguistic intuition
Mean Speech Rate (WPM)	95 wpm	132 wpm	Elimination of real-time rule searching
Self-Correction Rate (Intuitive)	22.0%	67.5%	Strengthened reflective self-monitoring mechanisms

Pause Frequency (per 100 words)	12.4	4.1	Reduced cognitive load during spontaneous speech

The findings confirm that while explicit teaching builds metalinguistic knowledge, it does not directly convert into implicit competence under communicative pressure. Conversely, combining immersive input with task-driven output and structured reflection accelerates the proceduralization of linguistic structures. Pre-service teachers in the experimental group demonstrated faster speech onset, higher grammatical accuracy in spontaneous conditions, and greater adaptability in professional teaching simulations.

CONCLUSION

Developing implicit language competence in future English teachers is essential for building authentic communicative mastery and professional pedagogical effectiveness. Moving away from purely explicit, rule-isolated instruction toward a unified model of communicative, immersive, and reflective approaches establishes an optimal acquisition environment. This integrated methodology enhances spontaneous output, sharpens linguistic intuition, and equips future educators with the operational fluency necessary for modern multi-lingual classrooms.

REFERENCES

1. Ellis, R. (2005). Measuring implicit and explicit knowledge of a second language: A psychometric study. Studies in Second Language Acquisition, 27(2), 141-172.
2. Elukhina, N. V. (1989). Obucheniye slukhovomu vospriyatiyu inoyazychnoy rechi [Teaching auditory perception of foreign language speech]. Inostrannye Yazyki v Shkole, (2), 25-31.
3. Jalolov, J. (2012). Chet tili uqitish metodikasi (Foreign Language Teaching Methodology). Tashkent: Uqituvchi. p.473
4. Krashen, S. (1982). Principles and Practice in Second Language Acquisition. Pergamon Press. p. 111
5. Leontiev, A. A. (1969). Yazyk, rech', rechevaya deyatel'nost' [Language, speech, speech activity]. Prosveshcheniye.
6. Long, M. (2014). Second language acquisition and task-based language teaching. John Wiley & Sons.
7. Makhkamova, G. T. (2017). Conceptual foundations of developing intercultural communicative competence of future English teachers. Higher Education Today, (4), 45-50.

8. Passov, E. I. (1991). Kommunikativnyy metod obucheniya inoyazychnomu govoreniyu [Communicative method of teaching foreign language speaking]. Prosveshcheniye.
9. Quldasheva, M. M. (2024). Bo'lajak ingliz tili o'qituvchilarida implitsit grammatik kompetensiyani shakllantirish metodikasi [Methodology for developing implicit grammatical competence in future English teachers]. Doctor of Philosophy (PhD) Dissertation Abstract.
10. Richards, J. C., & Rodgers, T. S. (2014). Approaches and Methods in Language Teaching (3rd ed.). Cambridge University Press.
11. Schmidt, R. (2001). Attention. In P. Robinson (Ed.), Cognition and Second Language Instruction (pp. 3-32). Cambridge University Press.

ABU-L-QOSIM AZ-ZAHRAVIY HAYOTI VA ILMIY FAOLIYATINING ASOSIY YO‘NALISHLARI

G.M. Ibrohimova

Farg‘ona davlat universiteti mustaqil tadqiqotchisi

gulhayoibrohimova@gmail.com

Annotatsiya: *Ushbu maqolada o‘rta asr islom tibbiyotining yirik namoyandalaridan biri Abu-l-Qosim az-Zahraviyning hayoti, ilmiy shakllanish muhiti va tibbiyot rivojiga qo‘shgan hissasi tahlil qilinadi. Tadqiqotning asosiy maqsadi az-Zahraviyning ilmiy faoliyatining yetakchi yo‘nalishlarini aniqlash, uning Kitāb al-Taṣrīf li-man ʿajaza ʿan al-taʾlīf asarining tibbiyot tarixidagi o‘rnini baholash hamda al-Andalus tibbiy maktabi rivojidagi ahamiyatini ko‘rsatishdan iborat.*

Annotation. *This article analyzes the life of Abu-l-Qasim az-Zahrawi, one of the major exponents of medieval Islamic medicine, the environment of scientific formation and his contribution to the development of Medicine. The main objective of the study is to identify the leading directions of az-Zahrawi's scientific activity, assess the place of his work Kitāb al-Taṣrīf li-man ʿajaza ʿan al-taʾlīf in the history of Medicine, and show its importance in the development of the Al-Andalus medical school.*

Kalit so‘zlar: *Abu-l-Qosim az-Zahraviy, al-Andalus, Qurtuba, Kitāb al-Taṣrīf, jarrohlik, farmakologiya, farmatsevtika, islom tibbiyoti, tibbiyot tarixi.*

Keywords: *Abu al-Qasim al-Zahrawi, al-Andalus, Córdoba, Kitab al-Tasrif, surgery, pharmacology, pharmaceutics, Islamic medicine, history of medicine.*

KIRISH

Abu-l-Qosim az-Zahraviy (taxminan 936–1013) o‘rta asr islom tibbiyoti tarixida, xususan, al-Andalus tibbiy maktabining rivojlanishi va jarrohlikning ilmiy-amaliy yo‘nalish sifatida shakllanishida muhim o‘rin egallaydi. Uning hayoti haqidagi ma’lumotlar nisbatan kam saqlangan bo‘lib, mavjud ma’lumotlarning asosiy qismi biobibliografik va tabaqot tipidagi manbalarda uchraydi. Shu sababli az-Zahraviyning ilmiy tarjimai holini tiklashda tarixiy-biografik manbalar bilan bir qatorda uning o‘z asarlaridagi ichki dalillar ham muhim ahamiyatga ega.

Az-Zahraviy haqidagi ilk ma’lumotlar al-Ḥumaydī, Ibn Ḥazm va Ibn Abī Uṣaybiʿah kabi mualliflarning asarlarida uchraydi. Mazkur manbalarda allomaning nomi, ilmiy mavqei, asari va vafot davri haqida ma’lumotlar berilgan. Al-Ḥumaydī az-Zahraviyni ilm va fazilat sohibi sifatida tavsiflab, uning *Kitāb al-Taṣrīf li-man ʿajaza ʿan al-taʾlīf* nomli yirik tibbiy asarini qayd etadi (al-Ḥumaydī, 1966, p. 209). Ibn Ḥazm esa mazkur asarning nazariy va amaliy jihatdan yuqori qiymatga ega ekanini ta’kidlaydi (al-Ḥumaydī, 1966, p. 209).

Az-Zahraviy yashagan davr al-Andalus tarixida siyosiy va madaniy yuksalishning muhim bosqichiga to‘g‘ri keladi. Qurtuba xalifaligi davrida ilmiy faoliyat, kitobat, tibbiyot va dorishunoslik rivojlangan. Yunon tibbiy merosi arab tiliga tarjimalar orqali o‘zlashtirilib, mahalliy amaliy tibbiyot tajribasi bilan uyg‘unlashgan. Qurtuba esa G‘arbiy islom dunyosining muhim siyosiy, iqtisodiy va ilmiy markazlaridan biriga aylangan (Fierro & Samsó, 1998).

Mazkur tadqiqotning maqsadi Abu-l-Qosim az-Zahraviyning hayoti va ilmiy faoliyatining asosiy yo‘nalishlarini aniqlash, uning *Kitāb al-Taṣrīf* asarining tibbiyot tarixidagi o‘rnini baholash hamda al-Andalus tibbiy muhitining alloma ilmiy qarashlari shakllanishiga ta’sirini tahlil qilishdan iborat.

Tadqiqotning asosiy vazifalari az-Zahraviy hayoti haqidagi asosiy tarixiy ma’lumotlarni tahlil qilish, uning ilmiy shakllanishiga ta’sir ko‘rsatgan al-Andalus tibbiy muhitini aniqlash, *Kitāb al-Taṣrīf* asarining mazmuni va ilmiy ahamiyatini tahlil qilish, az-Zahraviyning farmatsevtika va jarrohlik sohalaridagi hissasini aniqlash shuningdek, uning tibbiy merosining keyingi Yevropa tibbiyotiga ta’sirini baholashdan iborat.

Tadqiqot metodologiyasi. Tadqiqot tarixiy-manbashunoslik, qiyosiy-tarixiy va matniy-tahliliy metodlar asosida olib borildi. Manba bazasini az-Zahraviy haqidagi o‘rta asr arab biobibliografik asarlari, uning *Kitāb al-Taṣrīf* asari va mazkur merosga bag‘ishlangan zamonaviy ilmiy tadqiqotlar tashkil etdi.

Birinchi navbatda, al-Ḥumaydiyning *Jadhwat al-muqtabis fī dhikr wulāt al-Andalus* asari hamda Ibn Abī Uṣaybiʿahning tabiblar tarixiga bag‘ishlangan asaridagi az-Zahraviy haqidagi ma’lumotlar o‘rganildi. Ushbu manbalar orqali allomaning nomi, ilmiy mavqei, asosiy asari va hayotining xronologik chegaralari aniqlashtirildi.

Ikkinchi bosqichda *Kitāb al-Taṣrīf*ning mazmuni va tarkibi tahlil qilindi. Ayniqsa, asarning farmatsevtik va jarrohlikka oid qismlariga e’tibor qaratildi. Jarrohlikka bag‘ishlangan o‘ttizinchi maqola Spink va Lewis tomonidan tayyorlangan arabcha matn, inglizcha tarjima va sharh asosida o‘rganildi.

Uchinchi bosqichda az-Zahraviyning ilmiy merosi zamonaviy tarixiy tadqiqotlar bilan qiyoslandi. Jumladan, Hamarneh va Sonnedeckerning farmatsevtika tarixiga oid tadqiqoti hamda Pormann va Savage-Smithning o‘rta asr islom tibbiyotiga bag‘ishlangan asaridan foydalanildi. Tadqiqotda manbalararo qiyoslash usuli orqali az-Zahraviyning tarixiy qiyofasi keyingi davr talqinlaridan ajratib ko‘rsatildi. Shu bilan birga, uning ilmiy merosida nazariya va amaliyotning o‘zaro aloqasi, tibbiy bilimlarning tizimlashtirilishi va kasbiy tayyorgarlik masalalariga alohida e’tibor qaratildi.

Natijalar. Manbalarda az-Zahraviyning to‘liq ismi Abu-l-Qosim Xalaf ibn Abbos az-Zahraviy shaklida qayd etiladi. “Az-Zahraviy” nisbasi uning Qurtuba yaqinidagi Madīnat al-Zahrāʾ bilan bog‘liqligini ko‘rsatadi. U yashagan davr Abdurahmon III, al-Hakam II va Hishom II hukmronlik qilgan Qurtuba xalifaligining ilmiy-madaniy yuksalish davriga to‘g‘ri keladi. Az-Zahraviyning tug‘ilgan sanasi birlamchi manbalarda aniq ko‘rsatilmagan. Zamonaviy adabiyotlarda u ko‘pincha taxminan 936-yilda tug‘ilgan va 1013-yilda vafot etgan deb beriladi. Biroq al-Ḥumaydī uning hijriy 400-yildan keyin vafot etganini qayd etadi (al-Ḥumaydī, 1966, p. 209). Shuning uchun 936–1013 sanalarini mutlaq xronologik fakt sifatida emas, balki zamonaviy tarixshunoslikda qabul qilingan taxminiy sanalar sifatida ko‘rsatish maqsadga muvofiq.

Az-Zahraviy faoliyatining tarixiy sharoitini Qurtuba xalifaligining ilmiy va madaniy hayotidan ajratib bo‘lmaydi. Bu davrda yunon tibbiy merosi, xususan, Galen va Dioskorid an’analari arab tilidagi tibbiy ilm bilan uyg‘unlashgan. Dorishunoslik, botanika va amaliy tibbiyotning rivojlanishi al-Andalus tibbiy maktabining shakllanishiga zamin yaratgan (Fierro & Samsó, 1998).

Ibn Abī Uṣaybiʿah az-Zahraviyni oddiy va murakkab dorilarni yaxshi bilgan, amaliy tabobatda mohir tabib sifatida tavsiflaydi (Ibn Abī Uṣaybiʿah, 1971, pp. 643–644). Bu ma’lumot allomaning faoliyatini faqat jarrohlik bilan chegaralash to‘g‘ri emasligini ko‘rsatadi. Az-Zahraviyning eng muhim asari *Kitāb al-Taṣrīf li-man ʿajaza ʿan al-taʾlīf* hisoblanadi. Asar nomi uning didaktik maqsadini anglatadi. Muallif tibbiyotga oid keng bilimlarni tartibga solib, amaliy tabiblar foydalanishi mumkin bo‘lgan yaxlit majmua yaratishga intilgan.

Al-Ḥumaydī mazkur asarni katta, mashhur va foydali asar sifatida baholaydi (al-Ḥumaydī, 1966, p. 209). Ibn Ḥazmning asarga bergan yuqori

bahosi ham uning nazariya va amaliyotni birlashtirgan keng qamrovli tibbiy majmua sifatidagi mavqeini tasdiqlaydi.

*Kitāb al-Taṣrīf*ning mazmuni tibbiyotning turli yo‘nalishlarini qamrab oladi. Unda nazariy tibbiyot, kasalliklar, davolash usullari, parhez, oddiy va murakkab dorilar, farmatsevtik shakllar hamda jarrohlik masalalari yoritilgan. Shu sababli asarni faqat jarrohlik risolasi sifatida talqin qilish uning mazmuniy qamrovini toraytiradi. Az-Zahraviyning ilmiy faoliyatida farmatsevtika ham muhim o‘rin egallaydi. Hamarneh va Sonnedeckerning tadqiqotlari *Kitāb al-Taṣrīf*da dori tayyorlash texnologiyasi, dorivor moddalarning tarkibi, farmatsevtik shakllar va malhamlarga katta e’tibor berilganini ko‘rsatadi (Hamarneh & Sonnedecker, 1963, pp. 23–33, 81–126). Ayniqsa, asarning “al-Adhān” deb nomlangan yigirma beshinchi maqolasi farmatsevtika tarixi nuqtayi nazaridan muhimdir. Unda dori vositalarining tarkibi va tayyorlanishi bilan bog‘liq ma’lumotlar uchraydi. Bu holat az-Zahraviy farmatsevtikani faqat dorivor moddalarning xususiyatlarini bilish emas, balki ularni tayyorlash va amaliyotda qo‘llash texnologiyasi sifatida ham tushunganini ko‘rsatadi. Ibn Abī Uṣaybiʿahning az-Zahraviyni oddiy va murakkab dorilar bilimdoni sifatida ta’riflashi ham ushbu xulosani mustahkamlaydi (Ibn Abī Uṣaybiʿah, 1971, pp. 643–644).

Az-Zahraviy merosining eng mashhur qismi *Kitāb al-Taṣrīf*ning jarrohlikka bag‘ishlangan o‘ttizinchi maqolasidir. Ushbu qism *al-Maqālah fī al-ʿamal bi-l-yad* nomi bilan mashhur bo‘lib, jarrohlik amaliyotining turli yo‘nalishlarini tizimli ravishda bayon qiladi. Mazkur maqolada kesish, kuydirish, yaralarni davolash, yiringli joylarni ochish, begona jismlarni chiqarish, suyak sinishi va chiqishlarini davolash, tish va og‘iz bo‘shlig‘iga oid muolajalar kabi amaliy jarayonlar yoritilgan. Shuningdek, jarrohlik asboblari, ularning shakli va qo‘llanish usullarining tasvirlanishi asarning muhim xususiyatlaridan biridir (al-Zahrāwī, 1973). Spink va Lewis tomonidan nashr

qilingan materiallar az-Zahraviy jarrohlik amaliyotida anatomiya, tajriba va ehtiyotkorlikning muhimligini ta’kidlaganini ko‘rsatadi (al-Zahrāwī, 1973, pp. 2–3). Bu qarash jarrohlikni oddiy hunar emas, balki maxsus nazariy va amaliy tayyorgarlikni talab qiladigan tibbiy faoliyat sifatida ko‘rganidan dalolat beradi.

Az-Zahraviyning eng muhim yangiliklaridan biri jarrohlik asboblarini tizimli tasvirlash va ularning qo‘llanilishini tushuntirishdir. Asboblarning nomlari, vazifalari va amaliyotdagi o‘rnining qayd etilishi jarrohlik bilimlarini yozma ravishda standartlashtirishga xizmat qilgan.

Pormann va Savage-Smith az-Zahraviyning jarrohlik merosini o‘rta asr islom tibbiyotining muhim bosqichlaridan biri sifatida baholab, uning jarrohlik amaliyoti va asboblari haqidagi qarashlarini alohida ta’kidlaydi (Pormann & Savage-Smith, 2007, pp. 202–204). Shu jihatdan az-Zahraviy merosining ahamiyati faqat muayyan jarrohlik usullarining tavsifida emas, balki amaliy bilimlarni tizimlashtirish va ularni keyingi avlodlarga yetkazish imkonini beruvchi yozma model yaratganidadir.

Muhokama. Tadqiqot natijalari az-Zahraviyning ilmiy faoliyatini faqat jarrohlik bilan izohlash yetarli emasligini ko‘rsatadi. U tibbiyotning nazariy asoslari, farmatsevtika, klinik muolaja va jarrohlikni o‘zaro bog‘lagan qomusiy tabib sifatida namoyon bo‘ladi. Uning ilmiy merosining o‘ziga xos jihati mavjud bilimlarni amaliyotga moslashtirish va tizimlashtirishdan iborat. Al-Zahraviy qadimgi yunon tibbiy merosini inkor etmagan, balki uni al-Andalusdagi amaliy tibbiyot tajribasi bilan uyg‘unlashtirgan. Natijada *Kitāb al-Taṣrīf* nazariy bilim va amaliy tibbiyot o‘rtasidagi bog‘liqlikni ifodalovchi yirik tibbiy majmuaga aylangan.

Az-Zahraviyning faoliyati al-Andalusdagi ko‘p manbali tibbiy muhit bilan ham bog‘liq. Yunon-arab tibbiy merosi, mahalliy dorishunoslik tajribasi va amaliy tabobat an’analari uning ilmiy qarashlari shakllanishiga ta’sir ko‘rsatgan. Shu sababli uning merosini faqat individual ilmiy iste’dod mahsuli sifatida emas,

balki al-Andalusdagi ilmiy muhitning rivojlanishi bilan bog‘liq tarixiy hodisa sifatida baholash maqsadga muvofiq (Fierro & Samsó, 1998).

Az-Zahraviyning Sharq islom tibbiyoti bilan munosabatini ham aynan shu nuqtayi nazardan baholash kerak. Bag‘dod, Xuroson va Movarounnahrda tibbiyotning nazariy-falsafiy yo‘nalishlari rivojlangan bir paytda, al-Andalusda az-Zahraviy amaliy tibbiyot, farmatsevtika va jarrohlikni tizimlashtirishga katta hissa qo‘shdi. Bu ikki yo‘nalish bir-biriga qarama-qarshi emas, balki o‘rta asr islom tibbiyotining turli qirralarini ifodalovchi ilmiy an’analar sifatida qaralishi lozim (Pormann & Savage-Smith, 2007).

Shuningdek, az-Zahraviy tibbiy bilimlarning didaktik xususiyatiga katta e’tibor bergan. Jarrohlik amallarini yozma shaklda bayon qilish, asboblarni tasvirlash va amaliy jarayonlarning ketma-ketligini ko‘rsatish tibbiy bilimlarning o‘qitilishi va uzatilishini osonlashtirgan. Bu jihat uning asarini nafaqat ilmiy, balki ta’limiy manba sifatida ham muhim qiladi. Az-Zahraviy merosining keyingi tarixiy taqdiri ham uning ilmiy ta’sir doirasini ko‘rsatadi. *Kitāb al-Taṣrīf*ning jarrohlikka oid qismi lotin tiliga tarjima qilinib, muallif Yevropa ilmiy muhitida “Abulcasis” nomi bilan mashhur bo‘lgan. Shu tariqa uning jarrohlik haqidagi qarashlari arab-musulmon ilmiy muhitidan tashqariga chiqib, keyingi Yevropa tibbiy an’analariga ham kirib borgan. Demak, az-Zahraviyning tarixiy ahamiyatini uch asosiy jihatda umumlashtirish mumkin: birinchidan, u al-Andalus tibbiy bilimlarini tizimlashtirdi; ikkinchidan, farmatsevtika va jarrohlikni amaliy tibbiyot bilan bog‘ladi; uchinchidan, jarrohlik amaliyotini yozma, tasviriy va didaktik shaklda standartlashtirishga hissa qo‘shdi.

XULOSA

Abu-l-Qosim az-Zahraviy o‘rta asr islom tibbiyotining yirik namoyandalaridan biri bo‘lib, uning ilmiy faoliyati al-Andalus tibbiy maktabining rivojlanishida muhim bosqichni tashkil etadi. Uning hayoti

haqidagi biografik ma’lumotlar cheklangan bo‘lsa-da, o‘rta asr mualliflarining xabarlari va *Kitāb al-Taṣrīf* mazmuni allomaning ilmiy faoliyatini yetarlicha aniq tasavvur qilish imkonini beradi.

Tadqiqot natijalari az-Zahraviyning ilmiy faoliyati uch asosiy yo‘nalishda namoyon bo‘lganini ko‘rsatdi: umumiy va klinik tibbiyot, farmatsevtika hamda jarrohlik. Ayniqsa, *Kitāb al-Taṣrīf* ushbu yo‘nalishlarni yagona tibbiy tizimda birlashtirgani bilan ajralib turadi.

Az-Zahraviyning jarrohlik tarixidagi asosiy xizmati mavjud amaliy tajribani nazariy bilim, anatomiya, kasbiy tayyorgarlik va jarrohlik asboblari bilan uyg‘unlashtirib, tizimli ilmiy-amaliy shaklga keltirganidadir. Uning asarida jarrohlik amallarining ketma-ketligi, asboblarning tavsifi va bemor xavfsizligiga oid ehtiyotkorlik tamoyillarining berilishi tibbiy bilimlarni standartlashtirish jarayonida muhim ahamiyat kasb etgan. Shuningdek, az-Zahraviyning farmatsevtik qarashlari uning jarrohlik faoliyatini to‘ldirgan. Dorilarni tayyorlash, ularning shakli va qo‘llanish usullariga oid ma’lumotlar tibbiy muolajani kompleks yondashuv asosida tashkil etganini ko‘rsatadi. Umuman olganda, az-Zahraviy merosini faqat “jarrohlik otasi” kabi tor doiradagi ta’rif bilan cheklash maqsadga muvofiq emas. U al-Andalus ilmiy muhitida tibbiyotning nazariy, farmatsevtik va amaliy yo‘nalishlarini o‘zaro bog‘lagan, tibbiy bilimlarni tizimlashtirgan va ularni keyingi avlodlarga yetkazish uchun muhim yozma model yaratgan qomusiy tabib sifatida baholanishi lozim.

FOYDALANILGAN ADABIYOTLAR:

1. Abdel-Halim R.E., Altwaijiri A.S., Elfaqih S.R., Mitwalli A.H. Extraction of Urinary Bladder Stone as Described by Abul-Qasem Khalaf Ibn Abbas Alzahrawi (Albucasis): A Translation of Original Text and a Commentary // Saudi Medical Journal. – 2003. – Vol. 24 (12). – P. 1283–1291.
2. Abdulrazeq H.F., Ali R., Najib H., Doberstein C., Oyelese A., Gokaslan Z., Malik A.N., Asaad W.F., Greenblatt S. Al-Zahrawi (936–1013 AD): On the Surgical Treatment of Neurological Disorders by the Father of Operative Surgery // World Neurosurgery. – 2024. – Vol. 184. – P. 236–240.

3. Al Aloul A. Al-Zahrawi Surgical Instruments and Techniques: A Milestone in the History of Surgery and Biomedical Engineering // Medicine and Pharmacy Reports. – 2026. – DOI: 10.15386/mpr-2963.
4. Al-Benna S. Albucasis, a Tenth-Century Scholar, Physician and Surgeon: His Role in the History of Plastic and Reconstructive Surgery // European Journal of Plastic Surgery. – 2012. – Vol. 35, № 5. – P. 379–387.
5. Al-Ghazal S.K. Al-Zahrawi (Albucasis): A Father of Operative Plastic Surgery in Europe // Journal of the British Islamic Medical Association. – 2020. – Vol. 5. – P. 34–39.
6. al-Ḥumaydī M. ibn Futūḥ. Jadhwat al-muqtabis fī dhikr wulāt al-Andalus. – al-Qāhirah: al-Dār al-Miṣriyyah li-l-Taʾlīf wa-l-Tarjamah, 1966. – 314 s.
7. Al-Rodhan N.R.F., Fox J.L. Al-Zahrawi and Arabian Neurosurgery, 936–1013 AD // Surgical Neurology. — 1986. – Vol. 26 (1). – P. 92–95.
8. al-Zahrāwī. Taṣrīf li-man ʿajaza ʿan al-taʾlīf. al-Maqālah al-thalāthūn wa-al-akhīrah / taṣḥīḥ: Quṭb al-Dīn Aḥmad. – Lakhnaw: Maṭbaʿ al-Kāʾin, 1908. – 240 s.
9. Ammar S. Abu al-Qasim al-Zahrawi (Abulcasis): Arab Pioneer of Surgery // Quaderni Internazionali di Storia della Medicina e della Sanità. – 1992. – Vol. 1 (1). – P. 13–25.
10. Amr S.S., Tbakhi A. Abu Al Qasim Al Zahrawi (Albucasis): Pioneer of Modern Surgery // Annals of Saudi Medicine. – 2007. – Vol. 27 (3). – P. 220–221.
11. Arvide Cambra L.M. Abulcasis Al-Zahrawi, The Surgeon of Al-Andalus // European Scientific Journal. – 2016. – Special edition. – P. 240–247.
12. Fierro, M., & Samsó, J. (1998). Introduction. In M. Fierro & J. Samsó (Eds.), *The formation of al-Andalus: Part 2: Language, religion, culture and the sciences* (pp. 1–40). Ashgate.
13. Hamarneh S.K., Sonnedecker G.A. A Pharmaceutical View of Abulcasis al-Zahrāwī in Moorish Spain: With Special Reference to the “Adhān”. – Leiden: E.J. Brill, 1963. – XII. – 176 p.
14. Ibn Abī Uṣaybiʿa A. ibn al-Qāsim. ʿUyūn al-anbāʾ fī ṭabaqāt al-aṭibbāʾ / sharḥ wa-taḥqīq Nizār Riḍā. – Bayrūt: Dār Maktabat al-Ḥayāh, 1965. – 792 s.
15. Pormann P.E., Savage-Smith E. Medieval Islamic Medicine. – Edinburgh: Edinburgh University Press, 2007. – XIII. – 223 p.

LEXICAL-SEMANTIC ANALYSIS OF MILITARY TERMS

Melikulova Zarina

Teacher of Technical College No. 3, Karshi

Annotation: *This article examines the lexical-semantic organization of military terminology as a specialized subsystem of the national lexicon. Military terms are analyzed from the standpoint of their structural composition, semantic derivation, thematic classification, and functional dynamics under conditions of rapid technological change. The study employs component (seme) analysis, distributional analysis, and comparative-typological methods to establish the internal semantic relations (hyperonymy-hyponymy, synonymy, polysemy, and homonymy) that structure the military lexicon.*

Keywords: *military terminology, lexical-semantic analysis, semantic field, term formation, hyperonymy, polysemy, borrowing, terminography, military discourse, specialized vocabulary.*

Annotatsiya: *Ushbu maqolada harbiy terminologiyaning leksik-semantik tashkil etilishi milliy leksikaning ixtisoslashgan quyi tizimi sifatida tahlil qilinadi. Harbiy terminlar o‘zining tarkibiy tuzilishi, semantik hosila bo‘lish yo‘llari, mavzuiy tasnifi va tez texnologik o‘zgarishlar sharoitidagi funksional dinamikasi nuqtai nazaridan o‘rganiladi. Tadqiqotda harbiy leksikani tashkil etuvchi ichki semantik munosabatlarni (giperonim-giponim, sinonimiya, polisemiya va omonimiya) aniqlash uchun komponent (sema) tahlili, distributiv tahlil va qiyosiy-tipologik metodlardan foydalanilgan.*

Kalit so‘zlar: *harbiy terminologiya, leksik-semantik tahlil, semantik maydon, termin yasalishi, giperonimiya, polisemiya, o‘zlashtirish, terminografiya, harbiy diskurs, ixtisoslashgan leksika.*

Аннотация: *В статье рассматривается лексико-семантическая организация военной терминологии как специализированной подсистемы национальной лексики. Военные термины анализируются с точки зрения их структурного состава, семантической деривации, тематической классификации и функциональной динамики в условиях стремительных технологических изменений. В исследовании применены методы компонентного (семного) анализа, дистрибутивного анализа и сравнительно-*

типологический метод для выявления внутренних семантических отношений (гипер-гипонимии, синонимии, полисемии и омонимии), структурирующих военную лексику.

Ключевые слова: *военная терминология, лексико-семантический анализ, семантическое поле, терминообразование, гиперонимия, полисемия, заимствование, терминография, военный дискурс, специальная лексика.*

INTRODUCTION

Military terminology occupies a distinctive place among specialized lexical subsystems because it simultaneously serves three functions: nominative (naming weapons, ranks, operations, and institutions), regulatory (encoding command and control in statutes and manuals), and communicative (ensuring precision and unambiguity in operational contexts where misunderstanding carries high costs). As armed forces evolve technologically and doctrinally, the military lexicon expands, restructures, and periodically sheds obsolete units, making it a productive object for lexical-semantic research.

The relevance of studying military terms lexico-semantically is threefold. First, terminology systems are rarely static; new domains such as cyber warfare, unmanned systems, and information operations generate terms faster than lexicographic resources can standardize them. Second, military texts are among the most translation-sensitive genres, since a single mistranslated term (e.g., confusing *strategic* and *tactical* echelons, or *reconnaissance* and *surveillance*) can distort operational meaning. Third, military vocabulary offers rich material for general linguistic theory, illustrating how metaphor (*bridgehead, spearhead, theater of operations*), metonymy (*the Pentagon* for the U.S. Department of Defense), and borrowing (*blitzkrieg, guerrilla, commando*) operate within a semantically constrained professional register.

The empirical basis of the study comprises approximately 850 military terms and term-combinations excerpted from military regulations, field manuals, NATO glossaries, specialized military dictionaries, and contemporary military-political media texts in English, Uzbek, and Russian. Terms were selected using

continuous sampling from lexicographic sources, followed by verification of currency in authentic military discourse. The classification criteria combined semantic (thematic grouping), structural (simple, derived, compound, multi-word), and etymological (native vs. borrowed) parameters.

The analyzed corpus was distributed into six principal thematic subfields: (1) personnel and rank terminology (*private, sergeant, colonel, general staff*); (2) weaponry and military equipment (*armored personnel carrier, guided missile, small arms*); (3) operations and tactics (*offensive, ambush, encirclement, reconnaissance-in-force*); (4) organizational-structural terms (*battalion, brigade, division, joint command*); (5) logistics and support (*supply line, quartermaster, field hospital*); and (6) fortification, defense, and terrain (*bridgehead, defensive perimeter, no-man's-land*). The operations/tactics and weaponry subfields proved the most lexically productive, together accounting for over half of the sampled units, reflecting the doctrinal and technological centrality of these domains.

Hyperonym-hyponym chains were found to be highly developed, particularly in rank terminology (*officer → senior officer → colonel*) and unit-structure terminology (*armed forces → army → corps → division → regiment → battalion → company → platoon → squad*), forming strict taxonomic hierarchies that mirror the institutional chain of command. Synonymy was found to be predominantly stylistic or register-based rather than fully interchangeable: pairs such as *soldier/serviceman*, *enemy/adversary/hostile force* differ in formality, doctrinal precision, or connotation rather than denotation. Polysemy was identified in a notable proportion of core terms (approximately 18% of the sample), most frequently arising through metaphorical extension from general vocabulary (*front, wing, flank, theater*) or through terminologization of everyday words within institutional contexts (*command, operation, mission*). Homonymy between military and general-language meanings was also observed (*battery* as

an artillery unit vs. a power source; *company* as a military subunit vs. a commercial enterprise), which the analysis shows is resolved almost exclusively through context and register.

The results confirm that military terminology, despite its apparent rigidity and normative regulation, is not a semantically static inventory but a dynamic, systemically organized lexical field governed by the same cognitive and linguistic mechanisms that operate in the general lexicon - metaphor, metonymy, derivation, and borrowing - while being constrained by the domain's demand for precision and unambiguity. The strict hyperonymic hierarchies found in rank and unit terminology can be explained by the institutional nature of the military as a rigidly hierarchical organization: linguistic structure here directly mirrors social and command structure, a finding consistent with earlier terminology-studies scholarship on the isomorphism between conceptual and institutional systems.

The relatively high rate of polysemy (18%) found in the corpus is noteworthy because specialized terminology is often assumed, in classical terminological theory, to strive toward monosemy. The present findings suggest that this ideal is only partially realized in military vocabulary: while narrowly technical terms (weapon designations, unit codes) tend toward strict monosemy, higher-frequency operational and command terms (*operation, mission, command, front*) retain polysemy inherited from general usage, with military meaning activated contextually. This has direct implications for military translation and interpreting, where failure to correctly disambiguate such terms according to context and register can produce operationally significant errors - a concern raised in prior military-translation literature and corroborated by the distributional patterns observed here.

The dominance of the multi-word (analytic) model of term formation over single-word derivation is also significant. It indicates that the military terminological system favors compositional precision - building specificity

through modification (*forward operating base, close air support*) - over the creation of new lexical roots. This trend, combined with the high productivity of acronymy, points toward two competing pressures within military discourse: the need for exhaustive specification in formal documentation, and the need for rapid, economical communication in operational settings, resolved respectively through analytic phrases and their abbreviated forms.

Cross-linguistically, the comparative material indicates that Uzbek and Russian military terminologies, while structurally adapting to the typological features of their respective languages (agglutinative vs. fusional/inflectional), converge substantially at the level of semantic organization and increasingly at the level of source vocabulary, due to shared exposure to international (largely English-mediated) military and technological terminology. This suggests an ongoing process of internationalization of military lexicons, which merits further longitudinal study.

Certain limitations should be acknowledged: the corpus, while broad, was drawn predominantly from standardized and published sources and may underrepresent informal military slang (soldier jargon), which follows partly different semantic mechanisms (e.g., irony, euphemism) and would benefit from separate sociolinguistic investigation.

The lexical-semantic analysis of military terminology conducted in this study demonstrates that the military lexicon constitutes a hierarchically structured, semantically motivated subsystem shaped by institutional hierarchy, technological development, and the register's competing demands for precision and economy. The dominant paradigmatic relation is hyperonymy-hyponymy, mirroring command hierarchy; the dominant term-formation model is the analytic multi-word term, supplemented productively by acronymy; and polysemy, though constrained relative to the general lexicon, persists in high-frequency operational vocabulary through metaphorical extension. These

findings have practical applications for military terminography, the standardization of multilingual military glossaries, and the training of military translators and interpreters, and they open avenues for further research into military slang, diachronic shifts in military vocabulary, and the impact of emerging domains such as cyber and space warfare on terminological innovation.

REFERENCES

1. Akhmanova, O. S. *Terminology: Theory and Method*. Moscow: MSU Press, 1977.
2. Cabré, M. T. *Terminology: Theory, Methods and Applications*. Amsterdam: John Benjamins, 1999.
3. Grinev-Grinevich, S. V. *Terminovedenie*. Moscow: Academia, 2008.
4. Lakoff, G., Johnson, M. *Metaphors We Live By*. Chicago: University of Chicago Press, 1980.
5. NATO Standardization Office. *NATOTerm — NATO Terminology Database*.
6. Sager, J. C. *A Practical Course in Terminology Processing*. Amsterdam: John Benjamins, 1990.
7. Sanaqulov, U. *O‘zbek tili leksikologiyasi*. Toshkent: Fan, 2011.

O‘ZBEKISTONDAGI EFL TA’LIM OLUVCHILARINING YOZISH KO‘NIKMASINI RIVOJLANTIRISHDA FORMATIV BAHOLASHNI TAKOMILLASHTIRISH: O‘QITUVCHI VA AVTOMATLASHTIRILGAN FEEDBACKNING O‘RNI

Bobomurodova Nafisa Raxmatovna

Ixtisoslashtirilgan ta’lim muassasalari tasarrufidagi Peshku tuman ixtisoslashtirilgan maktabi

Annotatsiya: *Mazkur tezis O‘zbekistondagi ingliz tilini xorijiy til sifatida (EFL) o‘rganuvchilarning yozish ko‘nikmasini rivojlantirishda formativ baholash tizimini takomillashtirish masalasiga bag‘ishlangan. Asosiy e’tibor yozma ishlarni baholash jarayonida o‘qituvchi tomonidan beriladigan fikr-mulohaza (teacher feedback) hamda avtomatlashtirilgan fikr-mulohaza (automated feedback)ning pedagogik imkoniyatlari va funksional farqlariga qaratiladi. Yozish jarayonida avtomatlashtirilgan vositalar grammatik, leksik, imloviy va ayrim uslubiy kamchiliklarni tezkor aniqlash imkonini bersa, o‘qituvchi fikr-mulohazasi mazmun, argumentatsiya, matnning mantiqiy tashkil etilishi, kommunikativ maqsad va individual o‘quv ehtiyojlarini hisobga olishda muhim ahamiyat kasb etadi. Shu asosda tezisda avtomatlashtirilgan va o‘qituvchi feedbackini qarama-qarshi yondashuvlar sifatida emas, balki formativ baholashning o‘zaro to‘ldiruvchi komponentlari sifatida integratsiyalash zarurligi asoslanadi. Bunday yondashuv EFL ta’lim oluvchilarida matnni qayta ko‘rib chiqish, xatolar ustida ishlash, o‘z-o‘zini baholash va mustaqil yozish strategiyalarini shakllantirishga xizmat qilishi mumkin.*

Kalit so‘zlar: *EFL, formativ baholash, yozish ko‘nikmasi, teacher feedback, automated feedback, avtomatlashtirilgan baholash, qayta tahrirlash, learner autonomy.*

Abstract: *This paper addresses the issue of enhancing the formative assessment system for developing the writing skills of English as a Foreign Language (EFL) learners in Uzbekistan. The primary focus is on the pedagogical potential and functional differences between teacher feedback and automated feedback during the assessment of written work. While automated tools enable the rapid identification of grammatical, lexical, spelling, and certain stylistic errors during the writing process, teacher feedback plays a crucial role in addressing content, argumentation, logical text organization, communicative purpose, and*

individual learning needs. Based on this, the paper argues for the necessity of integrating automated and teacher feedback not as opposing approaches, but as complementary components of formative assessment. Such an approach can foster strategies for text revision, error correction, self-assessment, and independent writing among EFL learners.

Keywords: *EFL, formative assessment, writing skills, teacher feedback, automated feedback, automated assessment, revision, learner autonomy.*

KIRISH

Yozish ko‘nikmasini shakllantirish xorijiy tilni o‘qitishning murakkab yo‘nalishlaridan biri hisoblanadi. Ta’lim oluvchi yozma matn yaratishda grammatik va leksik bilimlarni qo‘llash bilan cheklanmay, fikrni mantiqiy tashkil etish, dalillarni izchil bayon qilish, matn qismlari o‘rtasida bog‘liqlikni ta’minlash hamda kommunikativ maqsadga mos til vositalarini tanlashi talab etiladi. Shu sababli yozishni baholash faqat yakuniy mahsulotga ball qo‘yish bilan cheklanmasdan, yozish jarayonining o‘zini rivojlantirishga xizmat qilishi zarur.

Formativ baholash aynan shu jihati bilan summativ baholashdan farqlanadi. Uning vazifasi ta’lim oluvchining mavjud holatini aniqlash bilan birga, keyingi rivojlanish yo‘nalishini ko‘rsatishdan iborat. Yozish ta’limida feedback ta’lim oluvchiga matndagi muammoni aniqlash, uning sababini tushunish va keyingi variantni takomillashtirish imkonini beradigan pedagogik mexanizm sifatida namoyon bo‘ladi.

Raqamli texnologiyalar va sun’iy intellektga asoslangan vositalarning rivojlanishi yozma ishlar bo‘yicha avtomatik feedback olish imkoniyatlarini sezilarli kengaytirdi. Bunday tizimlar matndagi imlo, grammatika, punktuatsiya, leksik tanlov va ayrim uslubiy xususiyatlarni qisqa vaqt ichida tahlil qilishi mumkin. Bu, ayniqsa, o‘qituvchining ko‘p sonli yozma ishlarni muntazam tekshirishi zarur bo‘lgan EFL muhitida amaliy ahamiyatga ega.

Biroq avtomatlashtirilgan feedbackni o‘qituvchi fikr-mulohazasining to‘liq o‘rnini bosuvchi vosita sifatida talqin qilish metodik jihatdan asosli emas.

Yozma matn sifati grammatik to‘g‘rilikdan kengroq tushuncha bo‘lib, unda argumentning asoslanganligi, mazmunning topshiriqqa mosligi, matn strukturasi, muallif pozitsiyasi va auditoriyani hisobga olish kabi murakkab komponentlar mavjud. Bunday jihatlarni baholashda pedagogning kasbiy mulohazasi muhim bo‘lib qoladi.

Shu sababli O‘zbekiston EFL kontekstida muhim masala “o‘qituvchi yoki avtomatlashtirilgan feedbackdan qaysi biri yaxshiroq?” degan savoldan ko‘ra, ularni yozish jarayonining qaysi bosqichida, qanday maqsadda va qanday nisbatda integratsiya qilish kerak? degan savol bilan bog‘liq.

Tadqiqotning maqsadi — O‘zbekistondagi EFL ta’lim oluvchilarining yozish ko‘nikmasini rivojlantirishda o‘qituvchi va avtomatlashtirilgan feedbackning funksiyalarini tahlil qilish hamda ularni formativ baholash jarayonida integratsiyalashning metodik modelini asoslashdan iborat.

Bu mavzuni kuchli tezis qilish uchun keyingi qismda Materiallar va metodlar, undan so‘ng esa o‘qituvchi feedbacki va avtomatlashtirilgan feedbackni qiyoslaydigan ilmiy jadval bilan Natijalar va muhokama qismini berish kerak. Eng muhimi, adabiyotlarni taxminiy emas, DOI va bibliografik ma’lumotlari tekshirilgan real manbalar asosida shakllantirish kerak.

MATERIALLAR VA METODLAR

Mazkur tadqiqot konseptual-tahliliy yondashuv asosida tashkil etilib, O‘zbekistondagi EFL ta’lim oluvchilarining yozish ko‘nikmasini rivojlantirishda formativ baholash, o‘qituvchi fikr-mulohazasi (teacher feedback) va avtomatlashtirilgan fikr-mulohazaning (automated feedback) pedagogik imkoniyatlarini qiyosiy o‘rganishga qaratildi. Tadqiqotda yangi empirik tajriba natijalarini taqdim etishdan ko‘ra, mavjud ilmiy-metodik yondashuvlarni tizimlashtirish va ular asosida integratsiyalashgan formativ baholash modelini shakllantirish asosiy metodologik yo‘nalish sifatida belgilandi.

Tahlil doirasida formativ baholashning yozish ta’limidagi funksiyasi, feedbackning ta’lim oluvchi faoliyatiga ta’siri, yozma matnni qayta ko‘rib chiqish (revision) jarayoni, o‘z-o‘zini nazorat qilish hamda ta’lim oluvchi mustaqilligini rivojlantirish masalalariga e’tibor qaratildi. O‘qituvchi va avtomatlashtirilgan feedback imkoniyatlarini qiyoslashda feedbackning tezkorligi, aniqligi, individual xususiyatlarni hisobga olishi, grammatik va leksik xatolarni aniqlashi, matn mazmuni va argumentatsiyasini baholashi hamda ta’lim oluvchini qayta tahrirlashga yo‘naltirishi asosiy mezonlar sifatida belgilandi.

Tadqiqotning metodik asosida yozish jarayoni bir martalik yakuniy mahsulot sifatida emas, balki rejalashtirish → dastlabki matnni yaratish → feedback olish → qayta tahrirlash → yakuniy variantni shakllantirish → refleksiya bosqichlaridan iborat iterativ jarayon sifatida ko‘rib chiqildi. Bunday yondashuvda feedbackning vazifasi xatoni ko‘rsatish bilangina cheklanmaydi; u ta’lim oluvchiga mavjud natija bilan kutilayotgan o‘quv natijasi o‘rtasidagi tafovutni anglash va keyingi harakatlarini belgilashga yordam berishi lozim.

Avtomatlashtirilgan feedbackning imkoniyatlari, avvalo, yozma matnning formal-lingvistik komponentlari bilan bog‘liq holda tahlil qilindi. Bunda imlo, punktuatsiya, grammatik shakllar, leksik tanlov, takroriy birliklar va ayrim uslubiy muammolarni tezkor aniqlash kabi funksiyalar e’tiborga olindi. O‘qituvchi feedbacki esa mazmunning topshiriqqa muvofiqligi, fikrlarning izchilligi, argumentatsiya sifati, matnning kommunikativ maqsadi va ta’lim oluvchining individual rivojlanish ehtiyojlarini hisobga olish imkoniyati nuqtayi nazaridan tahlil qilindi.

Shuningdek, tadqiqotda ikki feedback turini o‘zaro qarama-qarshi qo‘yish emas, balki ularning funksional taqsimotini aniqlash tamoyili qo‘llanildi. Shu asosda avtomatlashtirilgan feedback yozish va qayta tahrirlashning dastlabki bosqichlarida tezkor lingvistik yordam vositasi, o‘qituvchi feedbacki esa yuqori

darajadagi mazmuniy, diskursiv va pedagogik muammolarni aniqlash hamda individual yo‘naltirish vositasi sifatida konseptuallashtirildi.

Mazkur metodologik yondashuv asosida O‘zbekiston EFL ta’lim muhiti uchun “Automated feedback → Student revision → Teacher feedback → Final revision → Reflection” ketma-ketligiga asoslangan integratsiyalashgan formativ baholash modeli tahlil qilindi. Ushbu modelda avtomatlashtirilgan vosita o‘qituvchini almashtirish uchun emas, balki feedback jarayonining ayrim takroriy va formal komponentlarini qo‘llab-quvvatlash, o‘qituvchi esa murakkab pedagogik qarorlar va mazmuniy yo‘naltirishga ko‘proq e’tibor qaratishi uchun xizmat qiladi.

NATIJALAR VA MUHOKAMA

Tahlil natijalari yozish ko‘nikmasini rivojlantirishda o‘qituvchi fikr-mulohazasi (teacher feedback) va avtomatlashtirilgan fikr-mulohaza (automated feedback) bir xil vazifani bajarmasligini ko‘rsatadi. Ularning pedagogik qiymati qaysi biri ustun ekanligi bilan emas, balki yozish jarayonining qaysi bosqichida va qanday maqsadda qo‘llanilishi bilan belgilanadi. Shu nuqtayi nazardan, avtomatlashtirilgan feedback va o‘qituvchi feedbackini o‘zaro to‘ldiruvchi formativ baholash vositalari sifatida tashkil etish maqsadga muvofiq.

Avtomatlashtirilgan feedbackning asosiy ustunligi uning tezkorligidir. Ta’lim oluvchi yozgan matni tizimga kiritgach, imlo, punktuatsiya, grammatik qurilish, ayrim leksik tanlovlar va uslubiy kamchiliklar yuzasidan qisqa vaqt ichida fikr-mulohaza olishi mumkin. Bunday tezkorlik yozishni bir martalik topshiriqdan takroriy tahrirlash jarayoniga aylantirish imkonini beradi. Ta’lim oluvchi xatoni ko‘radi, taklif etilgan tuzatishni tahlil qiladi va matnning yangi variantini yaratadi. Natijada feedback yakuniy bahodan ko‘ra yozish jarayonining tarkibiy qismiga aylanadi.

Biroq avtomatlashtirilgan tizim tomonidan berilgan har bir tavsiyani avtomatik ravishda to‘g‘ri deb qabul qilish mumkin emas. Ayniqsa, muallifning

kommunikativ maqsadi, argumentning mantiqiyligi, fikrlarning o‘zaro bog‘lanishi, topshiriqqa muvofiqlik va auditoriyani hisobga olish kabi yuqori darajadagi yozuv komponentlarini baholashda avtomatlashtirilgan vositalarning tavsiyalari pedagogik ekspertizani talab qiladi. Shu sababli ta’lim oluvchida “tizim tavsiya qildi — demak, to‘g‘ri” tamoyilini emas, balki tavsiyani tahlil qilish va asosli qaror qabul qilish ko‘nikmasini shakllantirish zarur.

O‘qituvchi feedbackining ustun tomoni esa ta’lim oluvchining yozma ishini muayyan o‘quv maqsadi, topshiriq sharti va individual rivojlanish darajasi bilan bog‘liq holda baholash imkoniyatidir. O‘qituvchi faqat “nima xato?” degan savolga emas, balki “nima uchun bu qism yetarli emas?”, “fikrni qanday rivojlantirish mumkin?” va “keyingi matnda nimaga e’tibor qaratish kerak?” kabi savollarga ham yo‘nalish bera oladi. Shu jihatdan o‘qituvchi feedbacki yozuvning mazmuniy va diskursiv jihatlarini rivojlantirishda alohida ahamiyatga ega.

1-jadval. O‘qituvchi va avtomatlashtirilgan feedbackning funksional qiyosi

Mezon Avtomatlashtirilgan feedback O‘qituvchi feedbacki

Feedback tezligi Juda tezkor Tekshirish vaqtini talab qiladi

Imlo va punktuatsiya Yuqori imkoniyat Yuqori imkoniyat

Grammatik xatolarTez aniqlaydi, lekin kontekst tekshirilishi zarur Kontekst asosida izohlay oladi

Leksik tanlov Muqobil variantlarni taklif qilishi mumkin Kommunikativ maqsadga mosligini baholaydi

Matn strukturasi Ayrim umumiy tavsiyalar beradi Mazmun va vazifaga mos holda baholaydi

Argumentatsiya Cheklangan yoki tekshirishni talab qiladi Kuchli pedagogik tahlil imkoniyati

Individual ehtiyoj Foydalanuvchi ma’lumotiga bog‘liq O‘quvchining rivojlanishini hisobga oladi

Qayta tahrirlash Tez-tez revision qilish imkonini beradi Maqsadli revisionga yo‘naltiradi

Pedagogik mas’uliyat Yakuniy qaror manbai bo‘la olmaydi O‘qituvchi zimmasida qoladi

Qiyosiy tahlil ikki feedback turining funksional taqsimoti zarurligini ko‘rsatadi. Masalan, o‘qituvchi har bir matndagi imlo yoki oddiy grammatik xatolarni batafsil belgilashga katta vaqt sarflasa, mazmun, argumentatsiya va matn tuzilishiga chuqur feedback berish imkoniyati kamayishi mumkin. Formal xatolarning dastlabki tahlilini avtomatlashtirilgan vositalarga qisman yuklash o‘qituvchining e’tiborini murakkabroq pedagogik masalalarga yo‘naltirish imkonini beradi.

Shu asosda O‘zbekiston EFL ta’lim muhiti uchun quyidagi integratsiyalashgan jarayon taklif etiladi:

Dastlabki matn → avtomatlashtirilgan feedback → talabaning birinchi tahriri → o‘qituvchi feedbacki → ikkinchi tahrir → yakuniy matn → refleksiya.

Ushbu modelning muhim jihati shundaki, ta’lim oluvchi avtomatlashtirilgan feedbackni shunchaki qabul qilmaydi, balki undan keyin matnni mustaqil ravishda qayta ko‘rib chiqadi. O‘qituvchi esa tayyor tuzatishlarni berishdan ko‘ra, talabaning fikrlash va tahrirlash jarayonini boshqaradi. Yakuniy refleksiya bosqichida ta’lim oluvchi qaysi xatolar takrorlanganini, qaysi feedback foydali bo‘lganini va keyingi yozma topshiriqda nimaga e’tibor qaratishi kerakligini aniqlaydi.

Demak, formativ baholashni takomillashtirishning istiqbolli yo‘nalishi inson va texnologiya o‘rtasida “kim yaxshiroq baholaydi?” degan raqobatni yaratish emas, balki ularning funksiyalarini pedagogik jihatdan to‘g‘ri taqsimlashdan iborat. Avtomatlashtirilgan feedback tezkor diagnostika va

dastlabki tahrirlashni, o‘qituvchi feedbacki esa mazmuniy chuqurlik, individual yo‘naltirish va pedagogik qaror qabul qilishni ta’minlashi mumkin. Shu tarzda tashkil etilgan feedback sikli ta’lim oluvchini bahoning passiv qabul qiluvchisidan o‘z yozuvini tahlil qiluvchi va takomillashtiruvchi faol subyektga aylantirishga xizmat qiladi.

XULOSA

O‘zbekistondagi EFL ta’lim oluvchilarining yozish ko‘nikmasini rivojlantirishda formativ baholashni takomillashtirish feedback jarayonini faqat xatolarni aniqlash vositasi sifatida emas, balki ta’lim oluvchini yozma matnni qayta ko‘rib chiqish, tahrirlash va o‘z faoliyatini refleksiv baholashga yo‘naltiruvchi pedagogik mexanizm sifatida tashkil etishni talab qiladi.

Tahlil o‘qituvchi feedbacki va avtomatlashtirilgan feedbackning funksiyalari bir-biridan farq qilishini ko‘rsatadi. Avtomatlashtirilgan feedback imlo, grammatika, punktuatsiya, leksik tanlov va ayrim uslubiy xususiyatlar bo‘yicha tezkor fikr-mulohaza berish hamda ta’lim oluvchiga matnni bir necha marta qayta tahrirlash imkonini yaratishi bilan ahamiyatlidir. Biroq uning tavsiyalari kontekst va pedagogik maqsad nuqtayi nazaridan tanqidiy tekshirilishi zarur.

O‘qituvchi feedbacki esa yozma ishning mazmuni, argumentatsiyasi, mantiqiy izchilligi, kommunikativ maqsadi va ta’lim oluvchining individual ehtiyojlarini hisobga olish imkoniyati bilan ajralib turadi. Shu sababli avtomatlashtirilgan vositalardan foydalanish o‘qituvchining pedagogik rolini kamaytirish emas, balki uning feedback berish faoliyatini samaraliroq tashkil etish vositasi sifatida qaralishi lozim.

O‘zbekiston EFL ta’lim muhiti uchun “dastlabki matn → avtomatlashtirilgan feedback → birinchi tahrir → o‘qituvchi feedbacki → ikkinchi tahrir → yakuniy matn → refleksiya” modelidan foydalanish maqsadga muvofiq. Ushbu model feedbackning tezkorligi va pedagogik chuqurligini

birlashtirish, ta’lim oluvchilarning o‘z xatolarini tahlil qilish, asosli tahrir qarorlarini qabul qilish hamda mustaqil yozish ko‘nikmalarini bosqichma-bosqich rivojlantirish imkonini beradi.

Shunday qilib, yozish ko‘nikmasini o‘qitishda formativ baholashning samaradorligi feedbackning avtomatlashtirilgan yoki inson tomonidan berilishining o‘ziga emas, balki feedbackning o‘z vaqtida berilishi, tushunarliligi, pedagogik maqsadga muvofiqligi va ta’lim oluvchini keyingi amaliy harakatga undashiga bog‘liq. O‘qituvchi va avtomatlashtirilgan feedbackni ilmiy-metodik asosda integratsiyalash O‘zbekistondagi EFL ta’limida yozishni baholashdan — yozishni rivojlantirishga xizmat qiluvchi baholash modeliga o‘tish uchun istiqbolli yo‘nalish hisoblanadi.

FOYDALANILGAN ADABIYOTLAR

1. Hattie J., Timperley H. The Power of Feedback // *Review of Educational Research*. – 2007. – Vol. 77, №1. – P. 81–112. doi:10.3102/003465430298487. Mualliflar feedbackning samaradorligi uning turi, mazmuni va berilish usuliga bog‘liqligini asoslaydi. (DOI)

2. Kang E., Han Z. The Efficacy of Written Corrective Feedback in Improving L2 Written Accuracy: A Meta-Analysis // *The Modern Language Journal*. – 2015. – Vol. 99, №1. – P. 1–18. doi:10.1111/modl.12189. Meta-tahlil yozma corrective feedbackning L2 yozuv aniqligiga ta’sirini 21 ta empirik tadqiqot asosida umumlashtiradi. (DOI)

3. Ranalli J., Link S., Chukharev-Hudilainen E. Automated Writing Evaluation for Formative Assessment of Second Language Writing: Investigating the Accuracy and Usefulness of Feedback as Part of Argument-Based Validation // *Educational Psychology*. – 2017. – Vol. 37, №1. – P. 8–25. doi:10.1080/01443410.2015.1136407. Tadqiqot avtomatlashtirilgan yozuv baholash vositalaridan formativ baholashda foydalanishning aniqligi va amaliy foydaliligini tahlil qiladi. (Taylor & Francis Online)

4. Chong S.W. A Systematic Review of Written Corrective Feedback Research in ESL/EFL Contexts // *Language Education and Assessment*. – 2019. – Vol. 2, №2. – P. 57–69. doi:10.29140/lea.v2n2.138. Mazkur sistematik sharh ESL/EFL muhitida yozma corrective feedback bo‘yicha tadqiqotlarning asosiy tendensiyalarini umumlashtiradi. (Queen's University Belfast)

5. Lee I. Teachers’ Frequently Asked Questions about Focused Written Corrective Feedback // *TESOL Journal*. – 2019. – Vol. 10, №3. – e00427. doi:10.1002/tesj.427. Maqolada o‘qituvchi tomonidan beriladigan fokuslangan yozma feedbackning amaliy jihatlari ko‘rib chiqiladi. (Wiley Online Library)

6. Ene E., Kosobucki V. Individual and Collaborative Processing of Written Corrective Feedback Affects Second Language Writing Accuracy and Revision // *Assessing Writing*. – 2021. – Vol. 50. – Article 100566. doi:10.1016/j.asw.2021.100566. Tadqiqot feedbackni qayta ishlash va revision jarayoni o‘rtasidagi bog‘liqlikni ko‘rsatadi. (ScienceDirect)

7. Crosthwaite P., Ningrum S., Lee I. Written Corrective Feedback in Second Language Writing: A Synthesis of Naturalistic Classroom Studies // *Language Teaching*. – 2024. – Vol. 57, №4. – P. 449–477. doi:10.1017/S0261444823000393. 50 ta empirik tadqiqot asosida o‘qituvchi feedbacki, ta’lim oluvchilarning javobi, motivatsiya va hissiy omillar tizimlashtirilgan. (Cambridge University Press)

8. Mali Y.C.G. ChatGPT’s and Humans’ Written Corrective Feedback in EFL/ESL Writing: A Systematic Review // *Turkish Online Journal of Distance Education*. – 2026. – Vol. 27, №1. – P. 31–48. doi:10.17718/tojde.1598485. Ushbu sistematik sharh ChatGPT va inson tomonidan beriladigan yozma feedbackning kuchli va cheklangan jihatlarini 23 ta tadqiqot asosida qiyoslaydi. (DergiPark)

ONA TILI TA’LIMIDA TINGLAB TUSHUNISH TOPSHIRIQLARINI MOSLASHUVCHAN LOYIHALASH MEXANIZMI

Matniyazova Dilrabo Ulug‘bekovna

Samarqand davlat pedagogika instituti

mustaqil tadqiqotchisi

Annotatsiya. *Mazkur tezisda ona tili ta’limida tinglab tushunish topshiriqlarini yaratish va ularni turli ta’lim sharoitlariga moslashtirishning metodik mexanizmi yoritiladi. Tinglab tushunish topshirig‘ining metodik tuzilishi maqsad, tinglash materiali, tinglash sharoiti, o‘quvchi amali va natija mezoni kabi tarkibiy qismlarning funksional uyg‘unligi asosida talqin etiladi. Tadqiqotda topshiriqni moslashtirish jarayoni tayyor topshiriqqa keyinchalik tuzatish kiritish emas, balki uni loyihalashning ichki boshqaruv mexanizmi sifatida asoslanadi. Bunda asosiy metodik tamoyil sifatida “metodik maqsad barqaror, topshiriq parametrlari esa moslashuvchan” konsepsiyasi ilgari suriladi. Mazkur yondashuv bo‘lajak ona tili va adabiyot o‘qituvchilariga tinglab tushunish topshiriqlarini o‘quvchilarning tayyorgarlik darajasi, texnik imkoniyatlar hamda auditoriya sharoitidan kelib chiqib mustaqil yaratish hamda moslashtirish imkonini beradi.*

Kalit so‘zlar: *tinglab tushunish, ona tili ta’limi, lingvodidaktika, moslashuvchan loyihalash, audiomatn, o‘quvchi amali, natija mezoni, kognitiv yuklama.*

Abstract. *This thesis examines the methodological mechanism for developing listening comprehension tasks in mother tongue education and adapting them to diverse instructional*

contexts. The methodological structure of a listening comprehension task is interpreted as the functional integration of such components as the instructional objective, listening material, listening conditions, learner action, and outcome criteria. The study conceptualizes task adaptation not as a subsequent modification of a ready-made task, but as an internal control mechanism embedded in the task design process. Accordingly, the core methodological principle proposed is the concept that "the methodological objective remains stable, while task parameters remain flexible." This approach enables prospective teachers of the Uzbek language and literature to independently develop and adapt listening comprehension tasks according to learners' proficiency levels, available technological resources, and classroom conditions.

Keywords: *listening comprehension, mother tongue education, linguodidactics, flexible task design, audio text, learner action, outcome criteria, cognitive load.*

KIRISH

Tinglab tushunish nutq faoliyatining murakkab va faol turi bo‘lib, og‘zaki axborotni qabul qilish, uning semantik mazmunini anglash, asosiy va ikkilamchi ma’lumotlarni differensiyalash, mantiqiy-mazmuniy bog‘liqliklarni aniqlash, gipoteza tuzish hamda tinglangan axborotga nisbatan shaxsiy munosabat bildirish kabi aqliy-nutqiy jarayonlarni qamrab oladi. Shu sababli tinglab tushunish ko‘nikmasini shakllantirish jarayoni faqatgina audiomatnni eshittirish va u bo‘yicha ketma-ket savol-javob o‘tkazish bilan cheklanmaydi.

Tinglab tushunishni samarali rivojlantirish uchun topshiriqning metodik maqsadi, tinglash materiali, uni qabul qilish sharoiti, o‘quvchidan talab qilinadigan kognitiv-amaliy faoliyat hamda natijani baholash mezoni yaxlit tizim sifatida loyihalashtirilishi lozim. Ayniqsa, ta’lim muassasalaridagi texnik imkoniyatlarning turlichaligi, o‘quvchilarning tayyorgarlik darajasi va vaqt cheklovlari tinglab tushunish topshiriqlarini moslashuvchan tashkil etishni taqozo etadi.

Ona tili ta’limida tinglab tushunish masalasiga bag‘ishlangan tadqiqotlarda tinglab tushunishga oid testlarni yaratish va baholash, darsliklardagi topshiriqlarni tahlil qilish, interaktiv amaliy topshiriqlardan

foydalanish hamda o‘zbek tilini ikkinchi xorijiy til sifatida o‘qitishda tinglab tushunish ko‘nikmasini shakllantirish masalalari o‘rganilgan. Xususan, D. Abduraimova (2025) Tinglab tushunish ko‘nikmasiga oid testlarni yaratish va baholash masalalarini, S. B. Panjiyev (2025) “7-sinf ona tili darslarida tinglab tushunish ko‘nikmasini rivojlantirish bilan bog‘liq muammolarni, K. Mavlonova va Z. Sobirxonova (2025) Tinglab tushunishga oid interaktiv amaliy topshiriqlarni, Q. Q. Abdurasulov (2026) esa O‘zbek tilini xorijiy til sifatida o‘qitishda tinglab tushunish ko‘nikmasini shakllantirishning metodik asoslarini yoritgan.

Mazkur tadqiqotlardan farqli ravishda, ushbu tezisda tinglab tushunish topshirig‘ini loyihalash va yaratish, uning tarkibiy qismlarini o‘zaro muvofiqlashtirish va turli ta’lim sharoitlariga moslashtirishning yaxlit va moslashuvchan metodik mexanizmini asoslash markaziy masala qilib qo‘yiladi.

Tadqiqotning maqsadi. Ona tili ta’limida tinglab tushunish topshiriqlarini metodik maqsad, tinglash materiali, tinglash sharoiti, o‘quvchi amali va natija mezonining funksional uyg‘unligi asosida loyihalash hamda ularni turli ta’lim sharoitlariga moslashtirish mexanizmini nazariy va amaliy jihatdan asoslashdan iborat.

Tinglab tushunish topshirig‘ining metodik tuzilishi va loyihalash mexanizmi

Tinglab tushunish topshirig‘ini loyihalashda uning alohida elementlarini emas, balki ular o‘rtasidagi tizimli va funksional bog‘liqlikni hisobga olish lozim. Shu nuqtayi nazardan, topshiriqning metodik tuzilishi o‘zaro uzviy bog‘liq bo‘lgan 5 ta asosiy tarkibiy qismdan iborat:



Tinglab tushunish topshirig‘ini moslashuvchan loyihalash mexanizmi

Loyihalash bosqichlari

1-bosqich. Metodik maqsad

2-bosqich. Tinglash materiali

3-bosqich. Tinglash sharoiti

4-bosqich. O‘quvchi amali

5-bosqich. Natija mezoni

6-bosqich. Natijani tahlil qilish

7-bosqich. Moslashtirish zarurati

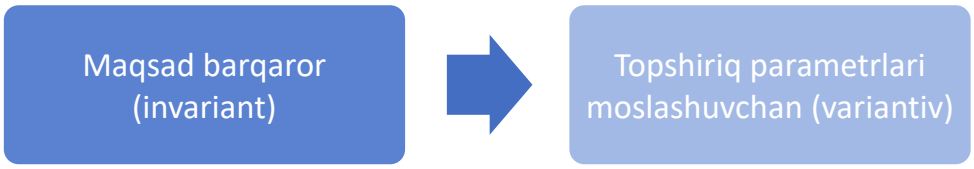
8-bosqich. Topshiriq parametrlarini

9-bosqich. Qayta loyihalash va qo‘llash

1-rasmga izoh: Mazkur mexanizmda metodik maqsad boshlang‘ich va invariant (o‘zgarmas) komponent sifatida namoyon bo‘ladi. Keyingi

bosqichlarda tinglash materiali, uni qabul qilish sharoiti, o‘quvchi tomonidan bajariladigan aqliy-nutqiy amal va natijani aniqlash mezoni mazkur maqsad bilan funksional jihatdan muvofiqlashtiriladi. Topshiriq bajarilgach, olingan natija tahlil qilinadi. Agar topshiriq o‘qituvchining mavjud tayyorgarligi yoki real ta’lim sharoitiga mos kelmasa, uning metodik maqsadi o‘zgartirilmaydi, balki variantiv (moslashuvchan) parametrlari qayta moslashtiriladi. Shu tariqa topshiriq qayta loyihalanadi va ta’lim jarayonida takroran samarali qo‘llanadi.

Jarayonning universal metodik formulasi:



Tinglab tushunish topshirig‘i komponentlarining funksional tavsifi

1-jadval. Topshiriq komponentlarining funksional va moslashuvchanlik xususiyatlari

Komponent	Metodik vazifasi	Asosiy parametrlar	Barqaror (Invariant) jihat	Moslashuvchan (Variantiv) jihat	Kutiladigan natija
Metodik maqsad	Rivojlantiriladigan tinglab tushunish amalini belgilash	Asosiy fikrni aniqlash, axborotni differensiyalash, taqqoslash, xulosa chiqarish	Metodik yo‘nalish va o‘quv maqsadi	Murakkablik darajasi, ko‘rsatiladigan yordam turi	Maqsadga yo‘naltirilgan nutqiy-kognitiv faoliyat
Tinglash materiali	O‘quvchi qabul qiladigan mazmunni belgilash	Mavzu, janr, hajm, leksik murakkablik, axborot zichligi	Maqsadga muvofiqlik (semantik moslik)	Matn hajmi, leksik qatlam, axborot zichligi, tayanch so‘zlar	Maqsadga va darajaga mos audiomatn

Tinglash sharoiti	Axborotni qabul qilish jarayonini tashkil etish	Audiomatn/o‘qituvchi nutqi, takrorlash soni, nutq sur’ati, texnik vosita	Maqsadga yo‘nalganlik	Takror tinglashlar soni, vaqt, taqdim etish usuli, vaqtinchalik pauzalar	Optimal tinglash sharoiti
O‘quvchi amali	Tinglangan axborotni faol qayta ishlashni ta’minlash	Aniqlash, guruhlash, taqqoslash, izohlash, xulosa chiqarish, asoslash	Maqsad bilan bevosita mantiqiy bog‘liqlik	Yordamchi tayanchlar, yo‘naltiruvchi savollar, kognitiv yuklama	Faol mazmuniy va mantiqiy qayta ishlash
Natija mezoni	O‘quvchi faoliyatining natijasini aniqlash va baholash	To‘g‘rilik, to‘liqlik, mazmunga muvofiqlik, axborotni asoslanganligi	Natijani aniqlash mantig‘i	Mezon murakkabligi, dalillash shakli (og‘zaki/yozma)	Kuzatiladigan va obyektiiv tahlil qilinadigan natija

Jadvaldan ko‘rinadiki, topshiriqning barcha komponentlari bir xil darajada o‘zgarmaydi. Metodik maqsad topshiriqning yo‘nalishini belgilovchi barqaror komponent bo‘lsa, tinglash materiali, tinglash sharoiti, yordam vositalari, vaqt va nutq sur’ati ta’lim sharoitiga ko‘ra moslashtiriladigan variativ parametrlar sanaladi.

“Tinglab tushunish topshirig‘i konstruktori” va uning amaliy namunalari

Bo‘lajak ona tili va adabiyot o‘qituvchilarida loyihalash kompetensiyasini shakllantirish uchun “Tinglab tushunish topshirig‘i konstruktori” ishlab chiqildi. Konstruktor 6 ta konseptual savolga asoslanadi:

1. Nima uchun? - Qaysi tinglab tushunish amali (kognitiv ko‘nikma) rivojlantiriladi?

2. Nimani tinglaydi? - Qanday mazmun, janr va hajmdagi material tanlanadi?

3. Qanday sharoitda tinglaydi? - Tinglash jarayoni qanday tashkil etiladi?

4. O‘quvchi nima qiladi? - Tinglashdan so‘ng qanday aqliy-nutqiy amal bajariladi?

5. Natija qanday aniqlanadi? -O‘quvchining natijasi qaysi mezon bo‘yicha baholanadi?

6. Sharoit o‘zgarsa, nima o‘zgaradi? - Metodik maqsad saqlangan holda qaysi parametrolar moslashtiriladi?

Amaliy namunalar: (Masalan)

Maqsad: O‘quvchida tinglangan matnning asosiy fikrini ajratib olish ko‘nikmasini shakllantirish.

Material: 1–2 daqiqalik publitsistik yoki ilmiy-ommabop audiomatn.

O‘quvchi amali: Tinglash → asosiy fikrni ajratish→ uni bir jumlada ifodalash.

Natija mezoni: Axborotning to‘g‘ri anglangani va ifodaning mantiqiy aniqligi.

Moslashtirish: O‘quvchi qiynalganda tayanch savollar beriladi yoki audiomatn ikkinchi marta eshittiriladi.

Yana bir misol:

Maqsad: Tinglangan axborot birliklarini mantiqiy va xronologik ketma-ketlikda joylashtirish.

Material: Voqealar rivoji yoki bosqichli jarayonlar yoritilgan matn.

O‘quvchi amali: Tinglash →muhim voqea/faktlarni ajratish→ularni ketma-ketlikda joylashtirish.

Natija mezoni: Axborot birliklarining mantiqiy mezonga mos tartiblanishi.

Moslashtirish: Boshlang‘ich bosqichda axborot birliklari soni kamaytiriladi (3-4 ta); o‘zlashtirish ortgani sari birliklar ko‘paytiriladi (6-8 ta).

Ilmiy yangilik va amaliy ahamiyati

Ilmiy yangiligi:

○Tinglab tushunish topshirig‘ining metodik tarkibi maqsad, tinglash materiali, sharoit, o‘quvchi amali va natija mezonining funksional birligi sifatida tizimlashtirildi.

○ Topshiriqni moslashtirish jarayoni statik tuzatish emas, balki loyihalashning dinamik va ichki boshqaruv mexanizmi sifatida asoslandi.

○ “Metodik maqsad barqaror — topshiriq parametrlari moslashuvchan” variativ ta’lim tamoyili ilmiy va metodik jihatdan dalillandi.

○ O‘qituvchilarning metodik kompetensiyasini oshirishga xizmat qiluvchi oltita savoldan iborat “Tinglab tushunish topshirig‘i konstruktori” ishlab chiqildi.

Amaliy ahamiyati:

Taklif etilayotgan mexanizm bo‘lajak ona tili va adabiyot o‘qituvchilarini pedagogik faoliyatga tayyorlashda, 5–11-sinf ona tili darsliklaridagi tinglab tushunish topshiriqlarini modifikatsiya qilishda hamda differensial ta’lim jarayonini tashkil etishda amaliy metodik qo‘llanma bo‘lib xizmat qiladi.

XULOSA

Ona tili ta’limida tinglab tushunish ko‘nikmasini samarali rivojlantirish topshiriqlarning shunchaki mavjudligi bilan emas, ularning metodik jihatdan to‘g‘ri va moslashuvchan loyihalashtirilganligi bilan belgilanadi. Tadqiqotda asoslangan “metodik maqsad barqaror — topshiriq parametrlari moslashuvchan” konsepsiyasi ta’lim jarayonida o‘quvchilarning individual

kognitiv imkoniyatlarini hamda real auditoriya sharoitlarini to‘liq hisobga olishga imkon beradi. Natijada bo‘lajak ona tili o‘qituvchisi tayyor topshiriqlarning oddiy ijrochisi emas, balki ularni ilmiy-metodik asosda yaratadigan, tahlil qiladigan va takomillashtiradigan pedagogik subyekt sifatida shakllanadi.

FOYDALANILGAN ADABIYOTLAR

1. Abduraimova, D. (2025). Ta’limda tinglab tushunish ko‘nikmasiga oid testlarni yaratish va baholash. Til va adabiyot.uz,

2. Abdurasulov, Q. Q. (2026). O‘zbek tilini xorijiy til sifatida o‘qitishda tinglab tushunish ko‘nikmasini shakllantirishning metodik asoslari (PhD dissertatsiyasi avtoreferati). Toshkent davlat o‘zbek tili va adabiyoti universiteti, Toshkent.

3. Mavlonova, K., & Sobirxonova, Z. (2025). 7-sinf o‘quvchilarida tinglab tushunishga oid interaktiv amaliy topshiriqlar. Shaxs ma’naviyatining shakllanishida til va adabiyotning roli (b. 501–507). Akademnashr.

4. Panjiyev, S. B. (2025). 7-sinf ona tili darslarida tinglab tushunish ko‘nikmasini rivojlantirishdagi muammolar va ularning yechimlari. Til, adabiyot, jamiyat va ong: fanlararo tadqiqotlar yo‘lidagi ulkan qadamlar (b. 1128–1132). Toshkent.

THE ROLE OF UZBEK PROVERBS IN THE FORMATION OF MORAL AND ETHICAL VALUES: A LINGUOCULTURAL AND PAREMIOLOGICAL PERSPECTIVE

Rajabova Nargiza Hamza qizi

Shahrizabz davlat pedagogika instituti 2-kurs tayanch doktaranti

***Abstract**: Moral and ethical values and positive personal qualities reflect the inner spiritual world of an individual and are largely shaped by education and upbringing. In contemporary society, the rapid development of the Internet and entertainment platforms has created both positive and negative influences on the moral development of the younger generation. In this context, traditional forms of cultural and linguistic heritage, particularly folk proverbs, continue to play an important role in transmitting moral values from one generation to another. Proverbs represent a significant component of the paremiological system of a language and embody the collective wisdom, life experience, customs, traditions,*

and moral ideals of a people. This article examines the role of Uzbek proverbs in the formation of moral and ethical values from a linguocultural and paremiological perspective. Particular attention is given to the formal-semantic relations of proverbs, especially synonymy, homonymy, and variation. Drawing on the theoretical views of G. L. Permyakov and examples from the Uzbek paremiological system, the study distinguishes between proverbs that express the same conceptual meaning through different linguistic forms and those that represent lexical or syntactic variants of the same proverb. The analysis demonstrates that Uzbek proverbs function not only as linguocultural units but also as compact micro-texts capable of conveying complex moral, social, and pedagogical meanings.

Keywords: *Uzbek proverbs, paremiology, linguoculturology, moral values, ethical values, synonymy, homonymy, variation, linguistic culture, folk wisdom.*

INTRODUCTION

Moral and ethical values and positive personal qualities serve as a reflection of an individual's inner spiritual world. The formation of these qualities throughout a person's life is undoubtedly closely connected with the education and upbringing they receive. The wisdom contained in the Uzbek saying **"Odob – boshdan"** emphasizes the importance of good manners and proper conduct from an early age.

Today, the rapid development of the Internet and various entertainment platforms has brought both positive and serious negative influences on the upbringing of the younger generation. As President Sh. M. Mirziyoyev has emphasized:

"It is well known that the upbringing of the younger generation has always been an important and pressing issue. However, in the twenty-first century in which we live, this issue is truly becoming a matter of life and death." [1, p. 504]

The wisdom expressed by the saying **"The more perfect the education, the happier the people live"** has acquired even greater relevance in the contemporary context. The development of an effective system of education requires the prevention of spiritual and moral vacuums. Nurturing children in the spirit of high moral values and cultivating such qualities as willpower, honesty,

and patience is an essential requirement of the present day. In the age of information technology, protecting young people from the negative effects of social media and directing the considerable potential of these technologies toward constructive purposes requires a high degree of responsibility from parents, teachers, and society as a whole.

At the same time, fundamental and applied research in Uzbek linguistics has entered a new stage. Folk proverbs, in particular, are increasingly viewed not only as instruments of moral education but also as important objects of linguistic research. A number of significant scholarly studies have been conducted in this area.

Within the **linguocognitive approach**, Bahora Jo‘raxolova’s study *“Linguocognitive Aspect of the Study of Proverbs”* provides an in-depth analysis of the conceptual, linguocultural, metaphorical, and cognitive nature of proverbs.

In the field of **linguoculturology**, Mirzo Tursunov’s work *“Linguocultural Features of Proverbs Expressing Hard Work in the English and Uzbek Languages”* compares the cultural and semantic characteristics of proverbs related to work in English and Uzbek.

Munojot Abdullayeva’s study *“Linguocultural Classification of Proverbs Expressing Gender Relations”* examines paremias expressing relationships between men and women from a linguocultural perspective.

Furthermore, Komila Sayfiyeva’s work *“Intercultural Comparative Study of Uzbek and English Proverbs with Phytonymic Components”* explores the national and cultural characteristics of proverbs containing plant-related lexical components.

The Linguocultural Significance of Proverbs

Proverbs are products of folk wisdom and collective life experience refined over centuries. They constitute important linguocultural units because

they preserve and transmit national customs, traditions, values, and ideals of human conduct. In a period characterized by rapid social and technological change, the paremiological heritage of a nation plays an important role in conveying moral and ethical norms to younger generations.

Personal spirituality can be understood as a combination of an individual's inner world, beliefs, and moral and psychological qualities. Language, together with the proverbs embedded within it, serves as one of the principal means through which concepts such as honesty, dignity, conscience, and the pursuit of knowledge are expressed, preserved, and transmitted.

In this regard, a thorough linguistic analysis of the formal and semantic relationships among proverbs is particularly important for understanding how spiritual and moral concepts can be transmitted to the younger generation through paremiological units [5, p. 137]. Like lexical units, or lexemes, proverbs possess relatively stable syntactic structures and can enter into various semantic relationships, including synonymy, homonymy, and antonymy.

Synonymy and Variation in Uzbek Proverbs

In world paremiology, considerable attention has been devoted to the systematic study of formal and semantic relationships among proverbs. The Russian scholar G. L. Permyakov was among the researchers who examined these relationships in detail, particularly the phenomena of synonymy and homonymy in paremias.

Permyakov classified proverbs belonging to homonymous series into four principal groups according to their linguistic and logical-semiotic characteristics and examined each group through specific examples. At the same time, in discussing the synonymous nature of proverbs, he raised several controversial issues concerning the boundary between synonymy and variation.

The scholar criticized the tendency of some folklorists and paremiologists to regard pairs or groups of closely related expressions simply as "variants."

From his perspective, when the conceptual question **"What is this expression a variant of?"** is posed, it becomes apparent that the invariant underlying such expressions may exist beyond the expressions themselves, at a higher and more abstract logical level. Consequently, at the purely paremiological level, such expressions may function as co-variants or as linguistic synonyms [5, p. 137].

The Uzbek paremiological system likewise contains numerous examples illustrating the phenomenon of proverb synonymy. Consider the following Uzbek proverbs:

"Bir balosi bo'lmasa, shudgorda quyruq na qilur."

"If there were no underlying cause, why would the fat tail be in the ploughed field?"

"Shamol bo'lmasa, daraxtning uchi qimirlamaydi."

"If there is no wind, the top of the tree does not move."

"Kasalni yashirsang, istamasi oshkor qiladi."

"If you hide an illness, its symptoms will eventually reveal it."

These proverbs should not be regarded merely as regional or linguistic variants of one and the same proverb. Rather, they may be interpreted as synonymous paremiological units because, despite their different lexical compositions and linguistic forms, they express the same broader conceptual meaning.

Their underlying semantic basis is the idea that a hidden cause, secret, or truth will eventually become apparent regardless of attempts to conceal it. In other words, they convey a fundamental cause-and-effect relationship.

A different linguistic relationship can be observed in another group of Uzbek paremias:

"Egri kaltakka to'g'ri soya tushmas"

"A crooked stick cannot cast a straight shadow."

"Egri kishining soyasi ham egri."

"Even the shadow of a crooked person is crooked."

"Pismiqdan yo'g'on chiqar"

"Something substantial may come from a seemingly quiet or reserved person."

"Pismiqdan hamma narsa chiqar."

"Anything may come from a seemingly quiet or reserved person."

"Sabrli bo'lsang, o'zarsan; sabrsiz bo'lsang, o'salsan."

"If you are patient, you will prosper; if you are impatient, you will suffer."

"Sabrli yetar murodga, sabrsiz qolar uyatga."

"The patient reach their goal, while the impatient are left in shame."

At first glance, these paremias may appear to constitute independent synonymous series. However, from a structural and semantic perspective, they can be regarded as linguistic variants—lexical and syntactic realizations—of the same proverb. Their general semantic content remains essentially identical, while their syntactic patterns, compositional structures, and principal lexical components retain substantial similarity and demonstrate lexical-semantic parallelism.

DISCUSSION

The distinction between synonymy and variation is particularly significant in the study of paremiological units. In ordinary lexical semantics, synonyms generally differ in their formal expression while sharing a significant degree of semantic similarity. In paremiology, however, the relationship is more complex because a proverb is not merely a combination of individual lexical units. It is a relatively stable linguistic structure that simultaneously incorporates semantic, syntactic, figurative, cultural, and pragmatic dimensions.

From this perspective, two proverbs can be considered synonymous when they employ substantially different lexical and figurative structures while

expressing the same general conceptual or logical situation. The difference between the expressions does not eliminate their semantic relationship because their underlying conceptual content remains shared.

Variation, by contrast, can be observed when the principal semantic and structural framework of a proverb remains essentially unchanged, while individual components are replaced, rearranged, or grammatically modified. In such cases, the relationship between the expressions is closer than ordinary synonymy because they preserve a common structural model and a substantial portion of their lexical foundation.

This distinction is important not only from a theoretical linguistic perspective but also for practical lexicography and educational methodology. Correctly identifying whether two proverbs represent synonyms or variants makes it possible to organize paremiological materials more systematically and to present the cultural and semantic relationships between individual units more accurately.

CONCLUSION

The study of formal and semantic relationships among paremias in Uzbek linguistics represents an important linguocultural approach to understanding the internal principles of the language system and the development of the people's collective worldview over time. The analysis demonstrates that, similarly to lexical units, Uzbek proverbs actively exhibit such semantic and formal relationships as synonymy and homonymy. However, synonymy at the paremiological level has a considerably more complex nature and should therefore be clearly distinguished from variation.

The analysis further indicates that proverbs with different figurative and lexical foundations may form synonymous relationships when they model the same general logical and situational invariant. Although their external forms may differ considerably, they retain a common conceptual meaning.

Conversely, when the syntactic structure, compositional organization, and principal lexical elements of a proverb remain substantially unchanged, while only certain components are substituted or grammatical forms are modified, the resulting relationship can be interpreted as variation.

Thus, Uzbek folk proverbs should be regarded not merely as expressive elements of speech with rich synonymous potential but also as compact micro-texts capable of representing particular situations through different linguistic forms while conveying profound pedagogical and didactic meanings. A precise distinction between their formal and semantic characteristics can contribute to the systematic organization of paremiological material in practical dictionaries and methodological resources aimed at promoting the moral and spiritual development of the younger generation.

REFERENCES

Mirziyoyev, Sh. M. *We Will Resolutely Continue Our Path of National Development and Raise It to a New Level.* Tashkent: O‘zbekiston, 2017. 592 p.

Shomaqsudov, Sh., & Shorahmedov, Sh. *Hikmatnoma: An Explanatory Dictionary of Uzbek Folk Proverbs.* Tashkent, 1990. 527 p.

Usmonova, Sh. *Linguoculturology.* Tashkent, 2019. 248 p.

Explanatory Dictionary of the Basic Concepts of Spirituality. Gafur Gulam Publishing House of Creative Printing, Tashkent, 2010. 333 p.

STRUCTURAL-SEMANTIC CHARACTERISTICS OF SPEECH ACTIVITY VERBS IN ENGLISH

Iskandarova Shaxodat Ravshanbekovna

Al-Xorazmiy universiteti ma’ruzachisi

E-mail: ishahodat5@gmail.com

Abstract: *This study examines the structural and semantic characteristics of speech activity verbs in English within the framework of lexical-semantic field theory and the paradigmatic approach. Speech activity verbs represent different forms of human communication, including speaking, informing, questioning, answering, explaining, arguing,*

persuading, and warning. The study focuses on the relations among these verbs and the semantic components that distinguish them within the lexical-semantic field of speech activity. Particular attention is given to paradigmatic relations, syntactic valency, communicative purpose, manner of speech, and the roles of the speaker and addressee. The analysis shows that verbs such as say, tell, ask, answer, explain, discuss, persuade, and warn share the general semantic component of communication but differ in their specific semantic features. These findings provide a theoretical basis for further comparative analysis of speech activity verbs in English and Uzbek.

Keywords: *speech activity verbs, lexical-semantic field, structural analysis, semantic analysis, paradigmatic relations, syntactic valency, speech paradigm.*

INTRODUCTION

Language functions as a system in which lexical units are interconnected through semantic, syntactic, and paradigmatic relations. This systemic perspective is particularly important in the study of speech activity verbs, which represent different forms of human communication. Verbs such as *say, tell, speak, talk, ask, answer, explain, discuss, argue, persuade,* and *warn* form an interconnected lexical-semantic group rather than an isolated collection of words.

The systemic understanding of vocabulary has its roots in structural linguistics. Saussure emphasized the importance of relations among linguistic units, while Trier's theory of semantic fields demonstrated that lexical meaning can be understood through a unit's position within a broader semantic system. Later developments in lexical semantics, including componential and frame-based approaches, have further demonstrated that related lexical units may share general semantic features while differing in specific components.

The present study aims to identify the structural and semantic organization of English speech activity verbs and determine their position within the speech paradigm. The analysis focuses on common and differential semantic components, paradigmatic relations, syntactic behavior, communicative purpose, and semantic specialization. Establishing these features is important for

subsequent contrastive research into the lexical-semantic field of speech activity in English and Uzbek.

1. Structural Characteristics of Speech Activity Verbs

Speech activity verbs form a lexical-semantic group characterized by common semantic and syntactic properties. Their structural analysis includes lexical grouping, syntactic behavior, valency, and paradigmatic relations. Levin (1993) classifies English verbs according to the interaction of semantic and syntactic properties.

English speech verbs differ in their complementation patterns:

- *say + clause*: *She said that she was tired.*
- *tell + object + clause*: *She told me that she was tired.*
- *ask + object + noun*: *She asked me a question.*
- *explain + object + to + person*: *She explained the problem to me.*

These patterns correspond to differences in semantic structure. *Say* expresses a message, *tell* indicates transmission of information to an addressee,

ask denotes information-seeking, and *explain* denotes making information understandable. Thus, syntactic valency is one of the structural characteristics distinguishing speech activity verbs.

According to their lexical-semantic properties, speech verbs can be grouped into general and specific units. *Say, speak,* and *talk* have relatively broad meanings, whereas *whisper, shout, persuade,* and *warn* contain additional features related to manner, communicative purpose, or intended effect.

2. Semantic Characteristics of Speech Activity Verbs

Speech activity verbs share the general semantic component of verbal communication, but differ in their differential semantic features. The main features include message, addressee, communicative purpose, direction, manner, and expected effect.

Verb	Differential semantic feature
say	expression of a message
tell	transmission to an addressee
speak	speech activity or language
talk	interactive communication
ask	obtaining information
explain	making information understandable
persuade	influencing an addressee
warn	preventing negative consequences

Speech verbs denoting communicative purpose include *ask, advise, persuade, warn, promise,* and *order*. Their meanings contain an intentional component. Manner-of-speaking verbs such as *whisper, murmur, mumble, shout,* and *scream* specify vocal intensity or clarity.

The semantic structure of speech activity verbs may be represented by the following components:

SPEECH ACTIVITY + SPEAKER + ADDRESSEE + MESSAGE/CONTENT + PURPOSE + MANNER + DIRECTION + EXPECTED EFFECT + SOCIAL CONTEXT.

The components are not equally prominent in every verb. For example:

- *say* → message;
- *tell* → addressee and information transfer;
- *ask* → information-seeking;
- *whisper* → manner;
- *persuade* → intended effect.

3. Speech Activity Verbs within the Speech Paradigm

The speech paradigm can be defined as a set of lexical units sharing the semantic domain of speech activity and differing in structural, semantic, pragmatic, and functional features.

The English speech paradigm can be divided into the following semantic zones:

Semantic zone	Main verbs	Main semantic feature
General speech	*say, speak, talk*	verbal communication
Information exchange	*tell, inform, report, mention, state*	information transmission
Question–response	*ask, answer, reply, respond*	information seeking/response
Explanation	*explain, clarify, describe, interpret*	making information understandable
Interaction and argumentation	*discuss, argue, debate, object*	exchange or opposition of opinions
Communicative intention	*advise, persuade, convince, warn, promise, order*	intended effect
Manner of speaking	*whisper, murmur, mumble, shout, yell*	manner/intensity of speech

The verbs within the paradigm are connected by several types of semantic relations: similarity, contrast, complementarity, inclusion, and specialization. For example, *say* and *tell* are semantically related but differ in their treatment of the addressee; *ask* and *answer* form a complementary pair; and *whisper, persuade,* and *warn* contain additional semantic features.

The paradigm also has a center–periphery structure. General verbs such as *say, speak,* and *talk* occupy central positions, while semantically specialized verbs such as *whisper, persuade,* and *warn* tend toward the periphery.

For comparative English-Uzbek research, these parameters can be applied to both languages to identify common and language-specific semantic components, paradigmatic relations, and central and peripheral members of the speech activity field.

CONCLUSION

Speech activity verbs in English form a structured lexical-semantic field united by the general concept of verbal communication. Their internal organization is determined by both structural and semantic relations. While verbs

such as *say, tell, speak, talk, ask, answer, explain, persuade,* and *warn* share a common semantic basis, they differ in syntactic valency, communicative purpose, direction, manner, participant roles, and intended effect.

The concept of the speech paradigm provides an effective framework for describing these relationships. It allows speech activity verbs to be grouped into semantic zones and examined through relations of similarity, contrast, complementarity, and specialization. The resulting model can serve as a methodological basis for comparative research into English and Uzbek, particularly for identifying universal and language-specific features in the organization of the lexical-semantic field of speech activity.

REFERENCES

Abdinazimov, L. M. (2024). Concerning verbs with social semantics in the Uzbek language. *Anglisticum. Journal of the Association-Institute for English Language and American Studies, 13*(4), 22–25.

Apresjan, J. D. (2000). *Systematic lexicography*. Oxford University Press.

Cruse, D. A. (2004). *Meaning in language: An introduction to semantics and pragmatics* (2nd ed.). Oxford University Press.

Fillmore, C. J. (2006). Frame semantics. In D. Geeraerts (Ed.), *Cognitive linguistics: Basic readings* (pp. 373–400). De Gruyter Mouton.

Goddard, C., & Wierzbicka, A. (2013). Suggesting, apologizing, complimenting: English speech-act verbs. In C. Goddard & A. Wierzbicka, *Words and meanings: Lexical semantics across domains, languages, and cultures* (pp. 156–183). Oxford University Press.

Levin, B. (1993). *English verb classes and alternations: A preliminary investigation*. University of Chicago Press.

Levin, B. (2015). Verb classes within and across languages. In A. Malchukov & B. Comrie (Eds.), *Valency classes in the world's languages: A comparative handbook* (Vol. 2, pp. 1627–1670). De Gruyter Mouton.

Lyons, J. (2002). *Linguistic semantics: An introduction*. Cambridge University Press.

Otaboeva, M. R. (2024). Semantic classification of speech verbs in Uzbek and communication verbs in English. *Conference Proceedings of the Uzbekistan State World Languages University*.

Saussure, F. de. (1916). *Course in general linguistics*. McGraw-Hill.

Trier, J. (1931). *Der deutsche Wortschatz im Sinnbezirk des Verstandes: Die Geschichte eines sprachlichen Feldes*. Winter.

Wierzbicka, A. (2003). *Cross-cultural pragmatics: The semantics of human interaction* (2nd ed.). Mouton de Gruyter.

Wierzbicka, A. (2006). *English: Meaning and culture*. Oxford University Press.

Ziyoyeva, D. A. (2023). Paradigmatic analysis of speech verbs in English and Uzbek languages. *Journal of New Century Innovations, 38*(2), 49–52.

BEATRIS FORBES MENZNING “TEMUR – YUKSALISH VA HUKMRONLIK YO‘LI” ASARI TAHLILI

Sharifova Nazokat Olimboy qizi

tadqiqotchi

Gurlan tumani 1-ayrim fanlar chuqur o‘rgatiladigan sinflari mavjud umumiy o‘rta ta‘lim maktabi tarix fani o‘qituvchisi

Annotatsiya: *Ushbu tezisda temurshunoslik yo‘nalishida yozilgan amerikalik professor Beatris Forbes Menzning “Temur – yuksalish va hukmronlik yo‘li” tadqiqoti tarixiy nuqtai nazardan tahlil qilinadi. Amir Temur shaxsi borasida amalga oshirilgan eng so‘nggi tadqiqotlardan biri hisoblangan bu asar jahon ilm-fani uchun katta ahamiyatga ega bo‘ldi. Asarni tahlil qilish orqali tarixiy voqealardagi muallif qarashlari ochib beriladi. Biz bilgan ma’lumotlar bilan muallif tomonidan berilgan ma’lumotlar o‘rtasidagi farqlar ko‘rsatiladi.*

Kalit so‘zlar: *Beatris Forbes Menz, ko‘chmanchilik, Chag‘atoy ulusi, turk-mo‘g‘ul merosi, apardilar, arlotlar, barlos urug‘i, islom dini.*

Аннотация: *В данной статье с исторической точки зрения анализируется труд американского профессора Беатрис Форбс Манц «Тимур: путь к возвышению и правлению» (Timur: Path of Rise and Rule) — значимая работа в области тимуридоведения. Эта книга, считающаяся одним из новейших научных исследований, посвященных личности Амира Тимура, имеет большое значение для мирового научного сообщества. Анализ данного труда позволяет раскрыть взгляды автора на исторические события, а также выявить различия между устоявшимися представлениями и сведениями, изложенными в книге.*

Ключевые слова: *Беатрис Форбс Манц, кочевничество, Чагатайский улус, тюрко-монгольское наследие, апарди, арлот, ислам.*

Abstract: *This paper analyzes from a historical perspective the study “Timur: Path of Rise and Rule” by the American professor Beatrice Forbes Manz, a significant work in the field of Timurid studies. Considered one of the most recent scholarly works on the figure of Amir Timur, this book holds great importance for the global academic community. Through an analysis of the work, the author's perspectives on historical events are revealed, and the*

differences between established knowledge and the information presented by the author are highlighted.

Key words: *Beatrice Forbes Manz, nomadism, Chagatai Khanate, Turco-Mongol heritage, Apardi, Arlot, Islam.*

KIRISH

Mashhur tarixchi olimlardan biri, AQShning Tufts universiteti professori Beatris Forbes Menzning “Temur – yuksalish va hukmronlik yo‘li” asari allaqachon jahon miqyosida shuhrat qozongan bo‘lib, bugungi kunda Amerika Qo‘shma Shtatlari, Angliya va Turkiya kabi mamalakatlarda Amir Temur davlati tarixini o‘rganishda muhim manbalardan biri bo‘lib qolmoqda. Olima asosan Yaqin Sharq va Markaziy Osiyo tarixi, ko‘chmanchilar va Temuriylar sulolasi tarixiga oid tadqiqotlar olib boradi. Ushbu tadqiqot 1989-yilda nashr etilganiga qaramay, o‘zbek tiliga endi tarjima qilindi va keng kitobxonlar ommasiga havola etildi. Muallifning barcha tadqiqotlari orasida ushbu tadqiqoti ko‘lami va tarixiy qimmati jihatdan ajralib turadi. Asarda Chag‘atoy ulusida tarqoq va o‘zaro nizolarga moyil qabilalar ustidan markazlashgan hokimiyatning qaror topishi, ulkan imperiyaga asos solinish jarayonlari, dasht va o‘troq aholi qatlamlarining mohirona boshqarilishi hamda Amir Temur vafotidan so‘ng Temuriylar saltanatining parchalanish jarayonlari ilmiy asosda yoritilgan.

Asarda e’tiborni tortadigan jihatlar ko‘p. Ulardan birinchisi, Amir Temurning tug‘ilgan yili bilan bog‘liq masala. Tadqiqotda uning 1320-yilda tug‘ilganligi aytiladi. Ko‘plab amerikalik va g‘arb tadqiqotchilari bu fikrga qo‘shilib, Amir Temurni chindan 1320-yil tug‘ilgan deb hisoblashadi. Biroq shuni aytish kerakki, Sharofuddin Ali Yazdiyning “Zafarnoma” asarida uning shabon oyining 25-kunida 1336-yil ya’ni bu hozirgi hisob bilan 1336-yil 9-aprel sanasida tug‘ilganligi qayd etilgan. Beatris Forbes Menz o‘z tadqiqotida Amir Temurni juda chiroyli so‘zlar bilan ta’riflaydi, xususan, “Temur Yevroosiyo

bo‘ylab bo‘ron misol kezib, butun dunyoda abadiy esda qoladigan nom qoldirdi.”[62]

Asar boshlanishida tadqiqotning maqsadi va vazifalari bayon qilingan. Tadqiqotchi Amir Temurning siyosiy maydonga kirib kelishini aytishdan oldin mo‘g‘ullar va Chig‘atoy ulusi haqida aytib o‘tadi. Chunki, u Amir Temurni ko‘chmanchi qabilalar vakili deb hisoblagan. Shu sababli ham uni ko‘chmanchi hukmdorlarning eng so‘nggi vakili deya ta’riflaydi. Amir Temur avlodlaridan biri bo‘lgan Zahiriddin Muhammad Boburning Hindistonda asos solgan ulkan imperiyasining g‘arb olimlari orasida Mo‘g‘ullar imperiyasi deb atalishi ham yuqoridagi qarashlarning mevasidir. Olimning yuqoridagi fikrlariga, Amir Temur mansub bo‘lgan barlos urug‘ining mo‘g‘ul qabilalaridan biri sifatida talqin qilishi sabab bo‘ladi. Lekin aslini olganda, barloslar mahalliy turkiy qabila hisoblanganlar, ular XIII asrning ikkinchi yarmida, Qashqadaryo vohasiga o‘rnashib, boshqa qabilalardan farqli o‘laroq, o‘troq turmush tarzi kechirgan.

Tadqiqotchi Amir Temurni afsonaviy va murakkab, ta’bir joiz bo‘lsa, g‘ayritabiiy nasabga ega shaxs ekanligini ta’kidlaydi. “Uning nufuzidan Yaqin Sharq va O‘rta Osiyoda temuriylardan keyingi turkiy sulolalar ham foydalandi. Jahoniy shuhrat sharqiy islom olamida XIX asrgacha so‘nmadi”, deb fikrlarini davom qildiradi olim. Sohibqironning o‘zi qanchalik buyuk va ulkan davlatga asos solmasin, uning vorislari buni shu holida saqlay olmadilar. Asarda shu haqda ham fikrlar keltirilib, buning sababi sifatida uning to‘g‘ri voris tanlay olmaganini, hayotlik chog‘ida saltanatni hech kimga ishonib topshirmaganini, u tayinlagan vorisni boshqa avlodlari tan olmay darrov yo‘q qilganligini ko‘rsatadi. Biroq, davlat qudrat jihatidan zaiflashgani bilan, boy berilayotgan qudratni madaniy jabhada obro‘ va nufuz bilan to‘ldirganligini qayd etadi.

[62] Beatris Forbes Menz. Temur – yuksalish va hukmronlik yo‘li. Pir nashriyoti, 2026. – B. 11.

Beatris Forbez Mens asosan ko‘chmanchilik mavzusiga oid tadqiqotlar olib borganligi sababli, ushbu Amir Temur hayoti haqidagi asarida ham ko‘chmanchilar hayotiga ko‘proq ahamiyat beradi. Amir Temurni ham xuddi Chingizxon kabi ko‘chmanchi hukmdorlar qatoriga qo‘shib mavzuni shu nuqtai nazar orqali yoritadi.

Asarning oxirgi qismi “Chag‘atoy ulusining kuch markazlari” bo‘limida XIV asr o‘rtalarida Chag‘atoy ulusida mavjud qabilalar sanab o‘tiladi. Ular qatoriga apardilar, arlotlar, barloslar, besudlar, boroldeylar, jaloyirlar, qoraunaslar, qipchoqlar, sulduzlar kabilar kiritilgan. Ulusda ularning har birining o‘ziga yarasha obro‘yi va vazifasi bo‘lgan. Tadqiqotchi ular haqidagi ma’lumotlarni o‘sha davrning eng muhim yozma manbalari bo‘lgan “Muiz-ul ansob”, Rashididdinning “Jome at-tavorix”, Nizomiddin Shomiyning “Zafarnoma”, Sharofuddin Ali Yazdiyning “Zafarnoma”, Hofizi Abruning “Muntaxab at-tavorix” asarlaridan olganligini qayd etadi.

XULOSA

Xulosa qilib aytganda, mazkur tarixchi olim ushbu asari orqali jahonda temurshunoslik sohasi taraqqiyotiga o‘z hissasini qo‘shdi. Menz Temur faoliyatini o‘rganish chog‘ida uni eng ko‘p hayratga solgani muvafffaqiyatsizlik emas, balki muvaffaqiyat, chalkashlik emas, balki izchil tizim ekanligini qayd etadi. Asar Temurning yurishlari tarixi emas, balki manbalarda to‘plangan tasodifiy ma’lumotlarga tayangan holda yozilgan. Temurshunoslik sohasiga qiziquvchi har bir tadqiqotchi ushbu asar bilan tanishib chiqishi maqsadga muvofiqdir.

FOYDALANILGAN ADABIYOTLAR RO‘YXATI:

1. Beatris Forbes Menz. Temur – yuksalish va hukmronlik yo‘li. Pir nashriyoti, 2026. – 383 b.
2. Шарафуддин Али Яздий. Зафарнома – Тошкент.: ”Шарқ” нашриёт- консерни, 2017. – 383 б.

FUNCTIONAL-SEMANTIC CHARACTERISTICS OF ARCHAISMS IN *BABURNAMA*

Kamoliddin Sodiqov

Namangan State Technical University

ksodikov@gmail.com

Abstract: *This paper examines the functional-semantic characteristics of archaic lexical units preserved in Zahiriddin Muhammad Babur's Baburnama. Archaisms in the work are considered not merely as obsolete linguistic elements but as important historical and cultural markers that reflect the social structure, administrative system, military environment, everyday life, clothing traditions, and worldview of the period. Particular attention is given to such lexical units as dorug'a, eshikog'a, chakmon, sadoq, and qopqa. The analysis demonstrates that these units perform several interconnected functions, including nominative, stylistic, historical, and ethnographic functions. Their semantic value becomes especially evident when they are examined within their historical contexts rather than interpreted through the meanings of their modern lexical counterparts. The study also considers the problem of semantic archaism, in which the lexical form may survive while its historical meaning changes or becomes restricted. The findings indicate that the adequate interpretation of Baburnama requires an integrated linguistic, historical, and cultural approach. Such an approach is particularly important for translating archaic vocabulary into English because a purely lexical interpretation may result in the loss of historical and cultural information encoded in the source text.*

Keywords: *Baburnama, archaism, historical vocabulary, functional semantics, historical linguistics, ethnographic function, Uzbek language*

INTRODUCTION

Historical literary works preserve linguistic units that are no longer productive or frequent in contemporary language. Such units are commonly referred to as archaisms. Their significance, however, extends beyond the linguistic system because they frequently preserve information about the historical period in which a text was produced. In this respect, the vocabulary of

Baburnama represents a particularly valuable linguistic and cultural source. The archaic lexical layer of the work provides evidence concerning the administrative structure, military organization, social relations, material culture, clothing, and everyday life of the Timurid and early Mughal period.

The distinction between archaisms and historicisms is important for the analysis of historical vocabulary. According to Rahmatullayev, an archaism is associated with a situation in which the concept itself remains known or relevant, while its former linguistic designation is replaced by another lexical unit (Rahmatullayev, 1964). Thus, archaism is primarily a result of lexical competition and historical change within the language. Reformatsky similarly emphasizes that lexical competition may result in one of two synonymous forms being displaced by another, after which the displaced form becomes archaic (Reformatsky, 1996).

The archaic vocabulary of *Baburnama* is therefore valuable for reconstructing not only earlier stages of Uzbek and Turkic vocabulary but also the conceptual world represented in the text. The historical meaning of an archaic unit cannot always be determined from its contemporary equivalent. In some cases, the same or a similar lexical form may acquire a different meaning over time. Rafiddinov draws attention to this problem of semantic archaization and emphasizes the danger of interpreting historical lexical units exclusively through their modern meanings (Rafiddinov, 2006).

The purpose of this paper is to identify the principal functional-semantic characteristics of archaic units in *Baburnama* and to demonstrate how their meanings are connected with the historical and cultural context of the work.

Archaisms as Historical and Cultural Markers. The archaic vocabulary of *Baburnama* may be regarded as a linguistic archive of the period. Words connected with administrative positions, military practices, clot hing,

weapons, and social organization encode information that cannot always be conveyed through their modern equivalents.

One important example is *dorug‘a*, which occurs in the statement: “Sulton Ahmad Mirzo Samarqandqa dorug‘a qilib erdi” (Babur, 2002, p. 56). In the historical context described in the dissertation material, *dorug‘a* referred to a person occupying a broad administrative and military position associated with urban administration, tax collection, and public order. Therefore, the lexical meaning of the unit is inseparable from the institutional structure of the period.

The word *eshikog‘a* provides another example. In “Ul zamonda ishik og‘asi Boboquliy edi” (Babur, 2002, p. 58), the expression refers not simply to a person responsible for a physical entrance but to a high-ranking court official responsible for access to the ruler, ceremonial reception, court protocol, and related administrative functions. The lexical structure of the expression reflects a social institution that requires historical interpretation.

These examples demonstrate that archaic vocabulary can function as a source of historical knowledge. The words themselves provide access to social structures that may no longer exist in their original form. Consequently, the study of archaisms should not be restricted to dictionary definitions.

Nominative Function. One of the principal functions of archaisms is nominative. They name objects, practices, institutions, or concepts that existed in the historical period represented in the text. The nominative function is particularly significant when the object or phenomenon has subsequently disappeared or its traditional name has been replaced.

Examples mentioned in the source material include *shishqa*, denoting a three-year-old sheep, and *qo‘shun*, referring to a military unit. Such units preserve historical distinctions within the vocabulary of animal husbandry and military organization.

The nominative function is also visible in clothing vocabulary. In the sentence “Mening ustimda bir oq yaktay edi, bir qizil chakmon ustidin kiyib erdim” (Babur, 2002, p. 165), the words *yaktay* and *chakmon* designate types of clothing characteristic of the historical and cultural environment of the text. Their use provides concrete information about material culture.

Stylistic Function. Archaisms also contribute to the stylistic identity of *Baburnama*. They reproduce the linguistic atmosphere of the period and distinguish the narrative from contemporary prose. Expressions such as *eltmak* and *o‘lturmoq* demonstrate that the archaic layer may function as an element of Babur’s individual narrative style.

The stylistic function is especially important in historical texts because the linguistic form itself contributes to the reader’s perception of time. If all archaic elements are replaced with modern vocabulary, the informational content of the text may remain generally understandable, but its historical linguistic character becomes weaker.

Therefore, archaism is not merely a lexical phenomenon. It can become an artistic instrument through which the author establishes temporal distance and reconstructs the atmosphere of the represented world.

Ethnographic Function. A particularly important function of the archaic vocabulary in *Baburnama* is ethnographic. Words such as *chakmon*, *yaktay*, and *mo‘za* provide information about clothing and material culture. They are therefore associated with cultural practices rather than only with abstract lexical meanings.

The example of *chakmon* is especially significant. In the source text, the narrator describes wearing a white *yaktay* and a red *chakmon*. The word refers to a substantial outer garment associated with protection from cold, wind, and rain and suitable for travel or military conditions. Consequently, its cultural meaning

includes information about environment, lifestyle, gendered clothing practices, and mobility.

The ethnographic function becomes particularly visible when such a word is compared with a culturally different English equivalent. Rendering *chakmon* as *gown*, for example, can preserve the general idea of an outer garment but may create a different cultural image. The source material indicates that *gown* is associated with European clothing traditions and therefore does not reproduce the specific cultural associations of *chakmon*.

Historical Function. The historical function of archaisms consists in their ability to situate events, institutions, objects, and social practices within a particular period. Administrative vocabulary such as *dorug'a* and *eshikog'a* is especially important in this respect.

A modern reader may understand the general meaning of an administrative title through a contemporary equivalent, but such substitution may obscure the institutional differences between historical societies. Thus, archaisms should be interpreted within the political and administrative system of the period.

The word *qopqa* offers another example. In the sentence "Samarqandning Ohanin qopqasi bila kirdilar" (Babur, 2002, p. 105), *qopqa* denotes a city gate. Although the contemporary word *darvoza* can replace it lexically, the archaic form reflects the older Turkic lexical layer and contributes to the historical character of the narrative.

Semantic Archaism and Historical Interpretation. A further problem concerns cases in which the lexical form remains recognizable but its historical meaning changes. Semantic archaism requires particular attention because a reader may unconsciously impose a modern interpretation on an old word.

As Rafiddinov (2006) notes, one of the major difficulties in interpreting classical texts is the possibility of understanding historical vocabulary through

contemporary meanings. This problem demonstrates that historical lexical analysis should combine linguistic evidence with contextual and cultural information. For this reason, the semantic analysis of *Baburnama* archaisms should consider at least three dimensions: the lexical form, its meaning in the historical period, and its function in the specific textual context. Such a multidimensional analysis helps distinguish genuine historical meanings from meanings developed in later stages of the language.

CONCLUSION

The analysis demonstrates that archaisms in *Baburnama* represent a multifunctional lexical layer. They perform nominative, stylistic, historical, and ethnographic functions and contribute significantly to the reconstruction of the linguistic and cultural environment of Babur's time. Administrative terms such as *dorug'a* and *eshikog'a* preserve information about historical institutions, while clothing terms such as *chakmon* and *yaktay* provide evidence concerning material culture and everyday life. Units such as *qopqa* demonstrate the continuity and transformation of the Turkic lexical heritage.

The interpretation of these units requires attention to historical semantics because modern lexical meanings cannot always explain their use in classical texts. Archaisms should therefore be approached as complex linguistic and cultural phenomena. Their analysis contributes not only to historical lexicology but also to the study of literary language, translation, cultural history, and intercultural communication.

REFERENCES

1. Babur, Z. M. (2002). *Boburnoma*. Sharq.
2. Rafiddinov, S. (2006). *Ma'no kashfiyoti*. Alisher Navoiy nomidagi O'zbekiston Milliy kutubxonasi nashriyoti.
3. Rahmatullayev, Sh. (1964). Arxaizm va istorizm. *O'zbek tili va adabiyoti*, (1), 29.
4. Reformatsky, A. A. (1996). *Vvedenie v yazykoznanie*. Aspekt Press.
5. Leyden, J., & Erskine, W. (Trans.). (1826). *Memoirs of Zehir-ed-din Muhammed Baber, emperor of Hindustan, written by himself in the Jaghatai Turki, and translated partly by the late John Leyden, Esq. M.D., partly by William Erskine, Esq., with notes and a geographical and historical introduction*. Longman, Rees, Orme, Brown, and Green.

6. Salomov, G‘. (1966). *Til va tarjima*. Fan.
7. Thackston, W. M. (Trans.). (1996). *The Baburnama: Memoirs of Babur, prince and emperor*. Oxford University Press; Freer Gallery of Art.

TRANSLATION STRATEGIES FOR ARCHAIC LEXICAL UNITS IN *BABURNAMA*

Kamoliddin Sodiqov

Namangan State Technical University

ksodikov@gmail.com

Abstract: *The translation of archaic vocabulary presents a particular challenge because historical lexical units simultaneously convey denotative meaning, stylistic information, and cultural associations. This paper investigates the strategies used to render archaic lexical units from Zahiriddin Muhammad Babur's Baburnama into English. Three English translations represented by Leyden and Erskine, Annette Beveridge, and Wheeler M. Thackston are examined through examples including dorug'a, eshikog'a, chakmon, sadoq, and qopqa. The analysis focuses on lexical substitution, functional equivalence, calque, transcription, descriptive translation, and archaisation. The comparison shows that different strategies produce different degrees of semantic and cultural preservation. Functional equivalents such as governor, prefect, and chamberlain can facilitate comprehension but may also introduce associations belonging to another administrative tradition. By contrast, transcription preserves source-language cultural identity but may require additional explanation. The paper argues that the choice of translation strategy should depend on the semantic, historical, and cultural status of the archaic unit rather than on its dictionary meaning alone. For culturally specific historical terms, a combination of transcription and concise functional explanation can provide a useful balance between cultural preservation and reader accessibility.*

Keywords: *translation of archaisms, Baburnama, transcription, functional equivalence, archaisation, cultural translation, historical translation*

INTRODUCTION

Translation of historical literary texts involves more than transferring lexical meanings from one language to another. A historical text contains linguistic forms that belong to a particular period and may therefore perform a temporal and cultural function. When such forms are translated into another

language, the translator must determine not only what the word denotes but also what historical and cultural associations it carries.

This issue is particularly relevant to *Baburnama*, whose vocabulary contains numerous administrative, military, social, and ethnographic units associated with the Central Asian cultural environment. The source material identifies transcription, lexical substitution, descriptive translation, and other strategies as important methods for translating these units. The problem becomes especially visible when the source term has no direct equivalent in the target culture.

Komissarov's concept of stylistic compensation is relevant to this problem. According to the approach presented in the source material, the translator should attempt to reproduce stylistic effects that cannot be transferred directly. In the case of historical vocabulary, this may involve archaisation, that is, selecting relatively old or stylistically marked target-language vocabulary to reproduce the historical atmosphere of the original (Komissarov, 1990).

The aim of this paper is to examine how different English translators render selected archaisms from *Baburnama* and to identify the advantages and limitations of the main translation strategies.

Functional Equivalence and the Translation of Administrative Archaisms. The translation of *dorug'a* demonstrates the complexity of functional equivalence. In the original text, *dorug'a* refers to a historically specific administrative position associated with urban government, tax collection, and public order. In the Leyden-Erskine translation, the term is rendered as *governor*: "Sultan Ahmed Mirza had appointed him Governor of Samarkand" (Leyden & Erskine, 1826).

The choice of *governor* provides immediate comprehension for an English-speaking reader. It identifies the person as a high-ranking administrator. However, functional comprehensibility does not necessarily guarantee

conceptual equivalence. The institutional meaning of *governor* belongs to a different administrative tradition, and the term may therefore create associations that were absent from the historical Central Asian context.

Beveridge takes a different approach: “Sultan Ahmad Mirza had made him darogha of Samarkand” (Beveridge, 1922). The source term is retained through transcription. This strategy preserves the historical and cultural specificity of the original lexical item. At the same time, the reader may not understand the meaning without contextual or explanatory information.

Thackston translates the term as *prefect*: “Sultan Ahmad Mirza had appointed him prefect of Samarkand” (Thackston, 1996). Although *prefect* can denote an official responsible for administrative or public-order functions, it introduces associations with European administrative history. Thus, the example demonstrates that a functional equivalent may be semantically useful while remaining culturally imperfect.

A possible translation strategy is therefore a combination of transcription and explanation, for example, *darogha*, followed by a short functional gloss identifying the official as a city administrator. Such a solution preserves the source term while making its function accessible to the reader.

The expression *eshikog‘a* illustrates the limitations of literal translation. In the source text, it denotes a high-ranking court official whose responsibilities included regulating access to the ruler and managing court protocol.

Leyden-Erskine translates the expression as *Lord of the Gate*. This represents a calquing strategy because the components of the source expression are reproduced literally. However, the English phrase may evoke the image of a person responsible for guarding a physical gate rather than an official performing administrative and ceremonial duties.

Beveridge and Thackston use *chamberlain*, retaining the source expression in parentheses: “At that time the chamberlain (ishik-agha) was Baba-

quli" (Beveridge, 1922; Thackston, 1996). This strategy combines functional equivalence with source-term preservation. *Chamberlain* communicates the administrative and ceremonial dimension more successfully than a literal translation, while *ishik-agha* preserves the historical designation.

The example suggests that hybrid strategies can be particularly useful for historical terms. The functional equivalent gives the reader access to the meaning, whereas the source term prevents the historical institution from being completely assimilated into the target culture.

The translation of *chakmon* provides a strong example of the value of transcription. In the source text, the narrator states that he wore a white *yaktay* and a red *chakmon*. Leyden-Erskine renders *chakmon* as *gown*, whereas Beveridge uses *chakman*. Thackston uses *overcoat*.

The three choices illustrate three different translation orientations. The term *gown* is highly accessible to an English-speaking reader but introduces a different cultural image. The source material emphasizes that *gown* is associated with European clothing traditions and does not reproduce the material, functional, and cultural characteristics of the Central Asian *chakmon*.

Overcoat is closer in functional meaning because it refers to an outer garment. Nevertheless, it remains a general English word and does not preserve the cultural specificity of the source item.

Beveridge's *chakman* preserves the original lexical identity. The source material considers this approach particularly effective because it retains the cultural reference while allowing additional explanation to communicate the meaning.

This case demonstrates that cultural preservation may sometimes require the translator to resist the temptation to replace a culturally specific word with a familiar target-language equivalent.

Not all archaisms require transcription. The term *sadoq*, denoting a container for arrows, is translated by the three translators using the English word *quiver*. In this case, the target language possesses a sufficiently close lexical equivalent.

The example demonstrates that the use of a source-language form is not automatically the most appropriate solution. When the historical object has a clear and culturally acceptable equivalent in the target language, functional or lexical equivalence may be sufficient.

Beveridge nevertheless adds the original term parenthetically, thereby combining accessibility with historical documentation. This approach can be particularly useful in scholarly translations where readers may be interested not only in the narrative content but also in the linguistic and cultural characteristics of the source.

The word *qopqa*, meaning a city gate in the historical context, presents a somewhat different situation. All three translators use *gate*. From a communicative perspective, the translation is straightforward because *gate* adequately identifies the physical object.

However, the source material points out that historical city gates also had strategic and defensive significance. Thus, although the basic denotative meaning can be transferred through *gate*, some historical associations may remain implicit or disappear.

This example shows that not every cultural difference is located in the lexical equivalent itself. Sometimes the target-language equivalent is correct at the denotative level, while additional contextual information is necessary to reproduce the historical significance of the object.

The translation of archaisms involves a broader opposition between archaisation and modernisation. Modernisation replaces a historical lexical item

with a contemporary target-language expression. This can improve readability but may reduce the historical atmosphere of the text.

Archaisation, on the other hand, attempts to reproduce the temporal distance of the source by selecting a stylistically marked or historically associated target-language form. Komissarov's theory of stylistic compensation supports the idea that a stylistic feature lost at one point in translation may be compensated for elsewhere (Komissarov, 1990).

Neither strategy should be applied mechanically. Excessive archaisation may make the translated text difficult for modern readers, while complete modernisation can flatten the historical character of the source. The translator therefore needs to balance historical authenticity and communicative accessibility.

CONCLUSION

The analysis of English translations of *Baburnama* demonstrates that the translation of archaisms is a multidimensional process involving semantics, stylistics, history, and culture. Functional equivalents such as *governor*, *prefect*, and *chamberlain* provide different degrees of accessibility but may also introduce target-culture associations. Calque, as illustrated by *Lord of the Gate*, can reproduce the formal structure of a source expression while failing to communicate its institutional meaning.

Transcription is particularly useful when the source term represents a culturally specific historical institution or object. The treatment of *chakmon* as *chakman* demonstrates how preservation of the original lexical form can maintain cultural identity. At the same time, the example of *sadoq* shows that a direct English equivalent such as *quiver* may be entirely appropriate when semantic correspondence is sufficiently strong.

The findings suggest that no single strategy can adequately translate all archaic units. A combination of transcription, functional explanation, lexical

equivalence, and controlled archaisation may provide a more balanced solution. The central principle should be the preservation of both meaning and historical-cultural identity while maintaining sufficient accessibility for the target reader.

REFERENCES

1. Babur, Z. M. (2002). *Boburnoma*. Sharq.
2. Beveridge, A. S. (1922). *The Baburnama in English*.
3. Komissarov, V. N. (1990). *Teoriya perevoda (lingvisticheskie aspekty)*. Vysshaya shkola.
4. Leyden, J., & Erskine, W. (1826). *Memoirs of Zehir-ed-Din Muhammed Baber*.
5. Thackston, W. M. (1996). *The Baburnama: Memoirs of Babur, Prince and Emperor*. Oxford University Press.
6. Ibragimova, R. A. “Boburnoma” matnidagi milliy udumlar va realiyalar inglizcha tarjimalarining lingvopragmatik tadqiqi. PhD dissertation, 2024.
7. Abdullayeva, Barno. “Boburnoma”ning xorijiy tillarga tarjima qilinishi. *Filologik komparativistika va tarjimashunoslik masalalari*, 2025.
8. Sherg‘oziyev, Sh. “The Role of Saj‘-i Matawazi in the Description of the Characters in the Text ‘Baburname’ and Its Reflection in English Translations.” 2022.

CULTURAL NON-EQUIVALENCE IN THE TRANSLATION OF HISTORICAL LEXIS IN *BABURNAMA*

Kamoliddin Sodiqov

Namangan State Technical University

ksodikov@gmail.com

Abstract: *Historical literary texts frequently contain lexical units that have no exact cultural equivalents in another language. This problem is particularly evident in the English translation of Zahiriddin Muhammad Babur's Baburnama, where administrative titles, clothing terms, military vocabulary, and names of material objects reflect the specific cultural environment of Central Asia. This paper explores cultural non-equivalence in the translation of selected historical and archaic lexical units, focusing on dorug'a, eshikog'a, chakmon, sadoq, and qopqa. The analysis demonstrates that formal or functional similarity between source and target-language words does not always guarantee cultural equivalence. Terms such as governor, prefect, gown, and overcoat may communicate general meanings while simultaneously introducing cultural associations absent from the source text. The study argues that historical translation should distinguish between denotative equivalence and cultural-conceptual equivalence. The preservation of ethnocultural information may require transcription, explanatory translation, or a combined strategy. Particular attention is given to the role of translation in reconstructing the worldview and material culture of the source community. The findings demonstrate that the translation of historical vocabulary should be viewed as intercultural mediation rather than simple lexical substitution.*

Keywords: *cultural non-equivalence, historical lexicon, Baburnama, cultural translation, realia, ethnocultural meaning, translation studies*

INTRODUCTION

Translation takes place at the intersection of languages and cultures. While lexical meaning can often be transferred through an equivalent word, historical texts contain many units whose meaning is inseparable from the cultural environment in which they were used. Such units may designate

institutions, social positions, objects, clothing, weapons, customs, or practices that have no direct counterpart in the target culture.

The problem is especially important in the translation of *Baburnama*. The work reflects the political, social, military, and material environment of Central Asia and contains lexical units that carry information about the historical world described by Babur. When these words are translated into English, the translator has to decide whether to preserve the source-language designation, replace it with a functional equivalent, explain it descriptively, or combine several strategies.

Cultural non-equivalence should be distinguished from simple lexical difference. Two words may refer to objects that appear similar but nevertheless differ in their historical function, social associations, or cultural significance. The translation of *chakmon* as *gown*, for example, illustrates how a formally acceptable general translation can produce a culturally different image. Similarly, translating *dorug'a* as *governor* communicates an administrative function but may not reproduce the institutional structure associated with the original title.

The objective of this paper is to examine cultural non-equivalence in the English translation of historical vocabulary in *Baburnama* and to identify the linguistic and cultural consequences of different translation choices.

Historical Lexis as Cultural Realia. Historical and archaic lexical units often function as realia because they refer to concepts, objects, or institutions associated with a particular culture. The source material emphasizes that *Baburnama* archaisms provide information about social organization, military terminology, everyday life, and worldview.

The term *dorug'a* is an example of administrative realia. In the historical context of the text, the word refers to an official with administrative, fiscal, and public-order responsibilities. Its translation as *governor* provides a general

understanding of political authority but does not fully preserve the institutional specificity of the original.

The same issue appears in the translation of *eshikog'a*. The historical term designates a court official whose responsibilities extended beyond controlling physical access to the ruler. These responsibilities included protocol, reception of important guests, and organization of court procedures.

Therefore, the cultural meaning of an historical term is often distributed across several semantic components. A single target-language word may reproduce one component while omitting others.

A useful distinction in historical translation is between denotative equivalence and cultural-conceptual equivalence. Denotative equivalence concerns the object or function referred to by a lexical item. Cultural equivalence additionally concerns the associations, historical background, social role, and worldview connected with that item.

The translation of *chakmon* illustrates this distinction particularly clearly. A *chakmon* is an outer garment associated with protection from environmental conditions and with travel or military activity. Translating it as *overcoat* captures the general category of an outer garment, thereby achieving partial denotative equivalence. However, the term does not preserve the Central Asian cultural identity of the object.

The translation *gown* creates an even greater cultural shift. Although *gown* may denote a loose outer garment, its associations in English-speaking cultures can include formal, ceremonial, domestic, or gender-specific clothing. These associations differ from those attached to *chakmon* in the historical context of *Baburnama*.

Consequently, lexical similarity should not be treated as sufficient evidence of cultural equivalence.

Clothing terminology is particularly sensitive to cultural non-equivalence because clothing reflects climate, social status, gender, occupation, material technology, and traditions.

The source text states: “Mening ustimda bir oq yaktay edi, bir qizil chakmon ustidin kiyib erdim” (Babur, 2002, p. 165). Here, clothing vocabulary contributes to the characterization of the narrator and the reconstruction of his historical environment.

If *chakmon* is translated simply as *gown*, the reader receives information about a garment but not necessarily about its Central Asian cultural identity. If it is rendered as *overcoat*, the functional characteristics become clearer, but the cultural specificity remains reduced.

Beveridge’s use of *chakman* preserves the lexical identity of the source term. This solution can be strengthened through a short explanatory gloss such as “a heavy woollen outer garment worn by Central Asian men.” Such a combined strategy makes it possible to preserve the original designation while communicating its basic function.

Administrative titles represent another important category of cultural non-equivalence. The translation of *dorug‘a* as *governor* demonstrates how institutional concepts may differ between historical societies.

The word *governor* belongs to the English political and administrative lexicon and is understandable to the target reader. Nevertheless, the historical position represented by *dorug‘a* had its own set of responsibilities. Consequently, the English term provides functional accessibility but may encourage the reader to interpret the institution through a modern or foreign administrative framework.

The use of *prefect* creates another type of cultural association. Although the word may suggest responsibility for public administration and order, it is strongly connected with particular European administrative traditions. Applying

such a term to a Timurid context can therefore shift the cultural frame of reference.

The use of *darogha* through transcription avoids this problem. However, transcription without explanation can create a comprehension barrier. This demonstrates why historical translation frequently benefits from a combined strategy in which the source term is preserved and its function is briefly explained.

The translation of *eshikog'a* demonstrates the difference between formal and functional correspondence. A literal rendering such as *Lord of the Gate* reproduces the surface structure of the source expression. However, it may encourage the reader to interpret the term as referring to a gatekeeper or military guard.

The use of *chamberlain* offers greater functional correspondence because the English term can denote a high-ranking court official associated with ceremonial and administrative responsibilities. Beveridge and Thackston's inclusion of the source form alongside the functional equivalent provides an additional layer of historical information.

This example supports the idea that cultural translation should not be reduced to word-for-word correspondence. The translator needs to identify the institutional concept underlying the lexical form.

Cultural non-equivalence is not universal. Some historical words have close equivalents in English. The translation of *sadoq* as *quiver* is an example.

The source term refers to a container used for carrying arrows. The English word *quiver* denotes essentially the same object. Consequently, the target-language equivalent successfully transfers the basic referential meaning.

This case is important because it demonstrates that cultural preservation does not necessarily require transcription. Where a stable and sufficiently close equivalent exists, direct lexical translation may be both accurate and natural.

Nevertheless, scholarly translation can preserve the source term in parentheses where documentation of the original terminology is relevant. Such a procedure can serve both communicative and academic purposes.

Historical translation has a special responsibility because the translated text may become the primary source through which readers encounter a foreign historical culture. If culturally specific vocabulary is systematically replaced with familiar target-language concepts, the reader may receive a text that is linguistically fluent but culturally transformed.

The source material describes translation as a meeting point between two cultural systems. At this intersection, similarities and differences between the cultures become visible. Historical and archaic vocabulary is particularly significant because it contains traces of social institutions and material culture that may have disappeared.

Therefore, the translator should consider not only whether a target expression is understandable but also what cultural image it creates. The translation of *chakmon* is illustrative: *gown* and *overcoat* may be understandable, but neither necessarily preserves the cultural identity carried by *chakmon*.

The analysis suggests several principles for dealing with culturally non-equivalent historical vocabulary:

First, the translator should identify the historical meaning of the source unit before searching for an equivalent.

Second, the translator should distinguish the general denotative meaning from the culturally specific components.

Third, culturally specific administrative titles, clothing names, and material objects may be preserved through transcription when no adequate equivalent exists.

Fourth, transcription should preferably be accompanied by a concise explanation when the term is essential to understanding the text.

Fifth, a functional equivalent may be used when it accurately communicates the principal social or practical function without introducing misleading cultural associations.

Finally, the translator should avoid unnecessary modernization when modernization removes historically significant information.

CONCLUSION

The translation of historical vocabulary in *Baburnama* demonstrates that cultural equivalence is often more complex than lexical equivalence. Terms such as *dorug'a*, *eshikog'a*, and *chakmon* contain cultural information that cannot always be transferred through a single English equivalent. The use of *governor*, *prefect*, *gown*, or *overcoat* may facilitate comprehension but can also modify the cultural image presented by the original text.

The comparison of the translations shows that transcription, particularly when accompanied by concise explanation, can preserve source-cultural identity. Functional equivalence remains useful when the target-language term accurately represents the historical function of the source item. The example of *sadoq* and *quiver* demonstrates that direct equivalence is possible when the two linguistic systems contain sufficiently corresponding concepts.

Ultimately, the translation of historical and archaic vocabulary should be regarded as a process of intercultural mediation. The translator is responsible not only for transmitting what a word denotes but also, where possible, for preserving the historical world and cultural associations encoded in that word. This principle is essential for producing translations of *Baburnama* that remain both readable and historically informative.

REFERENCES

1. Babur, Z. M. (2002). *Boburnoma*. Sharq.
2. Beveridge, A. S. (1922). *The Baburnama in English*.
3. Komissarov, V. N. (1990). *Teoriya perevoda (lingvisticheskie aspekty)*. Vysshaya shkola.
4. Leyden, J., & Erskine, W. (1826). *Memoirs of Zehir-ed-Din Muhammed Baber*.

5. Rafiddinov, S. (2006). *Ma'no kashfiyoti*. Alisher Navoiy nomidagi Uzbekiston Milliy kutubxonasi nashriyoti.

6. Rahmatullayev, Sh. (1964). Arxaizm va istorizm. *O'zbek tili va adabiyoti*, (1), 29.

7. Reformatsky, A. A. (1996). *Vvedenie v yazykoznanie*. Aspekt Press.

8. Thackston, W. M. (1996). *The Baburnama: Memoirs of Babur, Prince and Emperor*. Oxford University Press.

THE CONTRIBUTION OF THE TEMURIAN QUEENS TO THE PROSPERITY OF CULTURAL LIFE IN THE EXAMPLE OF GAVHARSHODBEGIM

Shakhnoza Bobokulova

Intern teacher of National University Of Uzbekistan

Tashkent, Uzbekistan

Abstract: *This article discusses the development of science during the Timurid period and the role of the Timurid princesses in the analysis of historical sources and scientific literature. In particular, Gavharshodbegim's active policy in public administration, as well as her contribution to the development of science is highlighted.*

Keywords: *Gavharshodbegim, Shahrukh Mirzo, Temurid princesses, science, Mahdi Ulyo, madrasa, architectural structures, Qavomiddin Sherozi.*

INTRODUCTION

Not only men but also women play an important role in governing the country. The names of Mary and Elizabeth, members of the famous Tudor dynasty, are often mentioned in Western sources.Although the names of women in the East are not often mentioned in history, they are often mentioned in sources. But at the same time, it is appropriate to recognize the life activities of women in the East in the past and their important role in public administration. This is because at a time when gender equality is a controversial issue, it is important for historians to study the activities of women rulers, warriors and other women who have played an important role in the life of the state and society. There were women in the Timurid kingdom who deserved such recognition. Usually, when we say Temurid princesses, of course, most people think of Saraymulk (Bibikhanum). But it is also worth noting that in addition to the Saroymulk, there are many other queens. In particular, Gavharshodbegim,

Shodimulkbegim, Hadichabegim, Khonzodabegim and Gulbadanbegim were among the representatives of the kingdom.

THE MAIN RESULTS AND FINDINGS

Many historians associate the political and cultural life of Shahrukh Mirza, the fourth son of Amir Temur, with Princess Gavharshodbegim. According to some sources, the queen is also glorified by the name of Mahdi Ulyo - "supreme swing" (supreme princess), which is usually given to princesses who are the mothers of the crown prince. She may also have been given the title because of her active participation in political life as the wife of the ruler.

There are various theories about the date of Gavharshodbegim's birth. For example, one of the historians, Azamat Ziya Gavhashodbegim, assumes that the date of birth of Shahrukh and his son Mirzo Ulugbek was between 1377 and 1380, depending on the dates of birth (1377 and 1394, respectively). Historian Turgun Fayziyev says that Gavharshodbegim was born in 1379 and married Shahrukh Mirzo in 1394. Gavharshod Beg was the daughter of Giyosiddin Tarkhan, who later strengthened his marriage by marrying his other daughters, Nigor aga and Saodat aga, as well as the princess, to Pirmuhammad mirza and Rustam mirza, the sons of Timur's son Umarshaikh.It is unknown at this time what he will do after leaving the post.

Gavharshodbegim presents three princes and two princesses to Shahrukh Mirza. The eldest son - Ulugbek Mirzo Koragon (Muhammad Taragay 1394-1449), the middle son Boysungur Mirzo (1397-1433) and the youngest son and Muhammad Joki Mirza (1401 -1445).

When we think of Gavhashodbegim, it is important to note that she is distinguished from other princesses by her subtle delicacy, unparalleled beauty, deep thinking, entrepreneurship and perseverance. Undoubtedly, the advice of Shahrukh Mirzo Gavharshodbegim was also needed in public administration. For example, Shahrukh Mirza's hesitation to appoint a crown prince until the end

of his life can be seen in his kindness to the queen's grandson, Aloud Davla Mirza.The main reason for the queen's decision is that the appointment of a worthy successor, rather than the accession of one of her children to the throne, will play a decisive role in the future of the country.In particular, one of the most worthy candidates, Mirzo Ulugbek, preferred to contribute to the development of science and enlightenment rather than the rule of the empire.

Historical sources confirm that Gavharshodbegim was active in the affairs of the kingdom during the reign of a ruler like Saroymulkhanim. In particular, while Shahrukh Mirza was marching to Iraq and Azerbaijan, Mahdi Ulyo Gavharshodbegim remained in Herat, while Prince Joghi assisted the brave princess in the affairs of the kingdom. It is clear that the ruler expressed confidence in the policies of the Mahdi Ulyana in public administration. Therefore, before the trip, the princess is appointed as the head of dorulsaltana affairs. The queen also had a special ring-seal. This ring-shaped almond-shaped silver was made of silver in 1457 in Herat and is a shining example of Timurid handicrafts. The ring-seal is now housed in the Treasury at the Ermitage Museum in St. Petersburg. The ring-seal belonging to the princess is the only monument left by Gavharshodbegim to this day. There was another important aspect of the queen that set her apart from other princesses. While Princess Saroymulkhanim only met Amir Temur, Gavharshodbegim also presided over the ceremonies of welcoming the influential representatives of the Timurid dynasty under the direction of Shahrukh. Gavharshodbegim also took an active part in organizing the weddings of the Temurid princes. In particular, the participation of the queen in the organization of the wedding ceremony of Mehr Nigor aga, daughter of the Mongolian khan Shami Jahann, and Mirza Muhammad Jogiy in the Garden of Zogan was invaluable.

In many cases, Shahrukh Mirza consulted with his wife in the affairs of the kingdom. At such times the princess was actively involved in the

administration of the kingdom. There is historical evidence that he was active in political life in the 1840s.For example, in 1444, when Shah Rukh Mirza was seriously ill, he tried to ascend the throne of his grandson Aloud Davla Mirza. At that time, Mahdi Ulyo was a regular sponsor of science, enlightenment and creative work for the development of the country's cultural life.Of course, the role of the ruler Shahrukh Mirza is unique.

In particular, Shah Rukh was a religious man, a fanatic.Nevertheless, under the direct influence of his wife Gavharshodbegim, his sons Boysungur and Ulugbek, he turned to science. During the reign of Shah Rukh, a number of luxurious and huge buildings were built in Herat:Musallo ensemble, Gavharshod mausoleum, Harjird madrasah and others were erected. The contribution of the famous architect and painter of his time Qavomiddin and his students Imamiddin and Giyosiddin to the development of architecture in Khorasan is invaluable. All the construction work during the reign of Shahrukh was under the guidance and participation of these masters.

It is impossible not to mention the architect Qavomiddin Sherozi in the cultural life of the Temurid Empire. This is because during the reign of Shahrukh Mirza, this architect took an active part in the construction of almost all the mosques, madrasas, khanaqahs and baths he built.

During Gavharshodbegim's lifetime, Shahrukh Mirzo completed the construction of an architectural complex named after him. Unfortunately, the princess was buried in her architectural complex in Herat after her grandson was abducted on the orders of Sultan Abu Said Mirza.

Such an architectural monument was built in two places.One of them was built in the center of Mashhad (Iran) in 1405-1419 in honor of Gavharshodbegim, the wife of the ruler of Herat Shah Rukh Mirza, and Qavomiddin Sherozi participated in the construction of the mosque. There are

four rooms on four sides of a large courtyard with a porch, the south of which is large and domed.

It can be accessed through a huge roof with a tower. The top of the towers is decorated with a cage. The mosque is decorated with elegant and beautiful colored tiles. On the north side of the mosque is the mausoleum of Imam Reza, on the east side is the madrasa, and on the west side is the city caravanserai, which is connected to the mosque by a corridor.

In early September 1418, Shahrukh Mirza visited the Ali ibn Musa Riza Madrasa in Mashhad. During the pilgrimage, Shahrukh Mirza hangs a chandelier made of three thousand shekels of gold on the dome of the mausoleum.Then he will visit the mosque built by Gavharshodbegim. Inspired by the building built by the Princess, Shahrukh Mirza ordered to build a palace and a garden around the complex.

Hazrat Mahdi (as) was well aware of the role of science and enlightenment in the development of the country. That's why he often left the ruler behind. Proof of this is the fact that their children and grandchildren are acquainted with science. Shahrukh Mirza's other wife, Princess Milkat Oga, is also to be commended for her efforts.He also built a madrasa in Herat, a hospital called Dorushshifo, a khanaqah called Dorulhadis, two baths, and a large, large rabot foundation between Darayi Zangi and Childukhtaron, nine miles from Herat.Prince Aloud Davla Mirza built a hospital. At the same time, private owners and wealthy people were allowed and encouraged to build on a charitable basis.

CONCLUSION

In conclusion, after Timur's death, the cultural life of the Timurid empire flourished during the reign of Shah Rukh. Not only the ruler but also his children and princesses Gavharshodbegim and Milkat aga are directly involved in these processes. After all, Princess Gavharshodbegim is often active in the

development of the country and urges the ruler to do the same. As mentioned above, it was precisely because of the Queen's program for scientific and cultural development that Shah Rukh supported her.And her children will grow up to be leaders in science. Today, in order to perpetuate the name of Gavharshodbegim, the Gavharshodbegim University of Information Management was established in 2010 in Kabul, Afghanistan, which provides great opportunities for higher education, especially for women.

REFERENCES

1. Ziyo A. Uzbek women on the stage of history. - T .: “Fan”, 2002.

2. Fayziev T. Timurid princesses. –T., 1994.

3. Abdurazzoq Samarkandiy. Matlai sadayn and majmai bahrayn. Volume 2, Part 1. /Translated from the Persian by A. Urinbaev. - T., 2008.

4. Kurbanova D. About some items belonging to women kept in museums of the world.

5. Norqulov N. Excerpts from the history of culture of the Timurid period. - Urgench. "Khorezm", 1996.

6. Xondamir. Habib us-siyar fi akhbori afrodi bashar. Translated from the Persian by J.Khazratkulov and I. Bekjanov.-Tashkent, 2008.

7. Polvanov, J. N. (2021). THE IMPORTANCE OF PUBLIC CONTROL IN BUILDING A DEMOCRATIC STATE BASED ON THE RULE OF LAW AND THE FORMATION OF CIVIL SOCIETY AND IN THE MANAGEMENT OF SOCIETY. Oriental Journal of History, PoliticsandLaw, 1(1), 4-8.

8. Ziyo, A. (2021). Silsilat as-salatin as a historical source. Asian Journal of Research in Social Sciences and Humanities, 11(11), 624-628.

9. Ziyo, A. (2000). History of Uzbek statehood. Tashkent: Sharq, 200, 250.

THE PROBLEM OF DISCREPANCY BETWEEN THE DENOTATIVE AND CONNOTATIVE MEANINGS OF SPORT TERMS

Khurramova Marjona

Anntation: *This article examines the problem of discrepancy between the denotative and connotative meanings of sport terms in the process of interlingual communication and translation. Sport terms, traditionally regarded as neutral, precise units of a specialized terminological system, in fact often carry additional evaluative, emotional, cultural and pragmatic layers of meaning that are not reflected in dictionary definitions. The article investigates the mechanisms by which connotative meaning arises in sport terminology, classifies types of denotative-connotative discrepancy, and analyzes cases where the loss or distortion of connotation in translation leads to communicative and pragmatic failure.*

Key words: *denotation, connotation, sport terminology, semantic discrepancy, terminologization, pragmatic meaning, evaluative component, translation equivalence, term neutrality, cultural connotation.*

Annotatsiya: *Ushbu maqolada tillararo muloqot va tarjima jarayonida sport terminlarining denotativ va konnotativ ma'nolari o'rtasidagi nomutanosiblik muammosi ko'rib chiqiladi. An'anaviy ravishda neytral, aniq maxsus tizim birligi sifatida qaraladigan sport terminlari, aslida ko'pincha lug'aviy ta'rifda aks etmaydigan qo'shimcha baholovchi, emotsional, madaniy va pragmatik ma'no qatlamlarini o'zida mujassam etadi. Maqolada sport terminologiyasida konnotativ ma'noning yuzaga kelish mexanizmlari o'rganiladi, denotativ-konnotativ nomutanosiblik turlari tasniflanadi, tarjimada konnotatsiyaning yo'qolishi yoki buzilishi kommunikativ-pragmatik muvaffaqiyatsizlikka olib keladigan holatlar tahlil qilinadi.*

Kalit so'zlar: *denotatsiya, konnotatsiya, sport terminologiyasi, semantik nomutanosiblik, terminologizatsiya, pragmatik ma'no, baholovchi komponent, tarjima ekvivalentligi, termin neytralligi, madaniy konnotatsiya.*

Аннотация: *В данной статье рассматривается проблема несоответствия денотативного и коннотативного значений спортивных терминов в процессе межъязыковой коммуникации и перевода. Спортивные термины, традиционно*

рассматриваемые как нейтральные, точные единицы специализированной терминологической системы, на деле нередко несут дополнительные оценочные, эмоциональные, культурные и прагматические слои значения, не отражённые в словарных дефинициях.

Ключевые слова: *денотация, коннотация, спортивная терминология, семантическое несоответствие, терминологизация, прагматическое значение, оценочный компонент, переводческая эквивалентность, нейтральность термина, культурная коннотация.*

INTRODUCTION

Terminology has traditionally been defined in linguistics as a system of lexical units characterized by monosemy, stylistic neutrality and the absence of connotative coloring. According to classical terminological theory, an ideal term denotes a single concept within a specific field and is free from emotional or evaluative overtones. However, sport terminology, as a special layer of the lexical system that functions simultaneously in professional discourse, mass media and everyday speech, systematically violates this theoretical ideal. Terms such as underdog, derby, comeback, knockout, or fair play possess not only a stable denotative core but also a rich connotative periphery shaped by cultural, historical, emotional and evaluative associations.

Materials and Methods: The empirical material of the study comprises approximately 180 sport terms and term-like units selected from English, German and Uzbek sports journalism (match commentary, post-game interviews, sports magazines), specialized dictionaries of sport terminology, and bilingual/trilingual sport glossaries. Particular attention was paid to terms functioning both in strictly professional (official rulebook) contexts and in mass-media contexts, since the connotative load of a term frequently emerges precisely at the boundary between these two registers.

The following methods were applied:

componential analysis - to decompose the meaning of a term into denotative (conceptual) and connotative (evaluative, emotional, stylistic, cultural) semes;

contextual analysis - to determine how the connotative component of a term is activated or suppressed depending on discourse type (official/journalistic/colloquial);

comparative analysis - to compare the connotative "weight" of corresponding terms across the three languages;

method of dictionary definition analysis - comparing entries in specialized (terminological) and general explanatory dictionaries to reveal where connotation is registered and where it is omitted;

translation equivalence assessment - evaluating published translations and interpretations of sport commentary for cases of connotative loss, addition or distortion.

Results: The analysis revealed three principal mechanisms by which sport terms acquire connotative meaning alongside their denotative core:

a) Metaphorical and metonymic transfer. Many sport terms originate from or are reinforced by metaphor, which inherently carries evaluative meaning. For example, the English term underdog denotes, denotatively, "a competitor given little chance of winning," but connotatively it evokes sympathy, admiration for perseverance, and a narrative of moral victory absent from a neutral paraphrase such as "weaker competitor." Its Uzbek rendering "kuchsizroq sanalgan ishtirokchi" preserves the denotative core but loses the emotionally sympathetic connotation entirely.

b) Discourse-conditioned emotional loading. Terms that are strictly neutral in rulebooks acquire strong evaluative coloring in media discourse. The term knockout (boxing) is denotatively neutral in official regulations ("a state in which a boxer is unable to continue"), but in commentary it frequently carries

connotations of dramatic finality, dominance, or even brutality - connotations largely absent from its Uzbek equivalent nokaut, which, as a relatively recent borrowing, has not yet accumulated the same depth of secondary associative meaning in the Uzbek linguistic consciousness.

c) Cultural-historical association. Some terms accumulate connotation through repeated association with specific historical events, national narratives or ideological contexts. The German term “Wunder von Bern” (“Miracle of Bern,” referring to West Germany’s 1954 World Cup victory) functions denotatively as a historical reference but connotatively as a symbol of national renewal - a layer of meaning that cannot be reconstructed by an outside audience without extensive cultural commentary, and which is entirely absent when the phrase is rendered literally into Uzbek or English as a mere historical fact.

CONCLUSION:

The study leads to the following conclusions:

1. Sport terminology, despite its formal status as a specialized terminological system, does not fully conform to the classical requirement of connotative neutrality; a substantial number of sport terms carry stable connotative components alongside their denotative core.

2. Connotative meaning in sport terms arises primarily through metaphorical transfer, discourse-conditioned emotional loading in media contexts, and cultural-historical association, distinguishing it from purely occasional or individual-speaker connotation.

3. Four principal types of denotative-connotative discrepancy were identified in cross-linguistic comparison: connotative loss, connotative addition, connotative shift, and partial denotative mismatch masking connotative divergence - of which connotative loss proved statistically most frequent (46% of cases).

4. Ignoring the connotative dimension of sport terms in translation and interpreting leads to measurable pragmatic distortion, weakening emotional impact in commentary or, conversely, introducing unwarranted evaluative coloring in ostensibly neutral reporting.

5. Bilingual sport dictionaries and glossaries should be supplemented with connotative-pragmatic annotations, and translator training in sports discourse should include specific attention to the evaluative-emotional layer of terminological meaning, not merely its conceptual content.

REFERENCES

1. Galperin I.R. Stylistics. - Moscow: Higher School Publishing House, 1977.
2. Vinogradov V.V. Selected Works: Lexicology and Lexicography. - Moscow: Nauka, 1977.
3. Komissarov V.N. Modern Translation Studies. - Moscow: ETS, 2002.
4. Newmark P. A Textbook of Translation. - London: Prentice Hall, 1988.
5. Leech G. Semantics: The Study of Meaning. - Harmondsworth: Penguin Books, 1981.
6. Karimov S. Sport terminologiyasi va uni tarjima qilish muammolari. - Toshkent: Fan, 2015.
7. Телия В.Н. Коннотативный аспект семантики номинативных единиц. - Москва: Наука, 1986.
1. Musurmanova Sh. Differences in the british and american variants of military terms. - Journal of positive school psychology 6 (2), 3212-3222

ДЖАДИДИЗМ В КАЧЕСТВЕ ФИЛОСОФИИ И ПЕДАГОГИКИ НОВОГО СОЗНАНИЯ

Ахмедов И.Р.

Ватан – университет, г. Ташкент, Республика Узбекистан

Ахмедов Исмаил Ризаевич,

Доктор педагогических наук (Ds)?

Профессор Университета Ватан

Аннотация: *Джадидизм не есть субстанция, противоречащая и даже противодействующая исламу, а наоборот, она есть составная часть ислама и исламского просвещения, модернизирующая нашу веру, философию и педагогику на основе высказывания нашего пророка Мухаммада (мир ему): «Илм ибодатдан афзалдир». Ему вторят великие узбеки, Богоутдин Накшбанд: «Сердце богу, руки работе» и Абдурауф Фитрат: «Мы – мусульмане и до конца дней своих останемся ими. Однако если бы не усвоим все достижения мировой цивилизации, мы будем отсталой нацией»*

Ключевые слова: *философия нового сознания, священнослужители, исламская вера, атеистическое учение, заявлять во всеуслышание, воспитание души и совести человека, созидание ума и эрудиции для будущего творчества и продвижения нации вперед, субстанция, противоречащая и даже противодействующая исламу, интеллектуалы, прогрессивная часть духовенства и лидеры местной буржуазии, модернизация ислама, философская, идеологическая и культурная константа, манифест джадидской партии*

Abstract: *Jadidism is not a substance that contradicts and even opposes Islam, but on the contrary, it is an integral part of Islam that modernizes our faith based on the statement of our prophet Muhammad (peace be upon him): "Ilm ibodatdan afzaldir." He is echoed by the great Uzbeks, Bogoutdin Naqshband: "Heart to God, hands to work" and Abdurauf Fitrat: "We are Muslims and will remain them until the end of our days. However, if we did not learn all the achievements of world civilization, we would be a backward nation"*

Keywords: *philosophy of new consciousness, clergymen, Islamic faith, atheistic teaching, publicly declaring, educating the soul and conscience of a person, creating the mind and erudition for the future creativity and moving the nation forward, substance that contradicts and even opposes Islam, intellectuals, the progressive part of the clergy and leaders of the local bourgeoisie, modernization of Islam, philosophical, ideological and cultural constant, manifesto of the Jadid party*

Annotatsiya: *Jadidchilik Islomga zid va hatto qarshilik qiluvchi substansiya emas, aksincha, Islom dinining payg‘ambarimiz Muhammad alayhissalomning: «Ilm ibodatdan afzaldir» degan so‘zlari asosida imonimizni modernizatsiya qiluvchi tarkibiy qismidir. Buyuk o‘zbeklar, Bogoutdin Naqshband: "Xudoga yurak, ishga qo‘l" va Abdurauf Fitrat: "Biz musulmonmiz va umrimizning oxirigacha shunday qolamiz. Agar biz dunyo sivilizatsiyasining barcha yutuqlarini o’zlashtirmasak, biz orqada qolgan xalq bo’lamiz"*

Kalit so‘zlar: *yangi tafakkur falsafasi, ruhoniylar, Islom dini, ateistik ta’limot, ochiq e’lon qilish, inson ruhi va vijdonini tarbiyalash, kelajakdagi ijodkorlik va millat taraqqiyoti yo‘lida aql-idrok hamda bilimdonlikni rivojlantirish, Islomga zid va hatto unga qarshi turuvchi mohiyat, ziyolilar, ruhoniylarning ilg‘or qatlami va mahalliy burjuaziya vakillari, Islomni modernizatsiya qilish, falsafiy, mafkuraviy va madaniy o‘zgarmas asos, Jadidlar partiyasi manifesti*

Джадидизм есть философия нового сознания. Священнослужители, глубоко ненавидя их, словно траурный вопль и топот безумных ног, кричали вослед, что джадиды создают безбожные школы, чуждые нашей исламской вере, а большевики кричат, будто объелись несуществующих хлопот, что джадиды – обратное их атеистическому учению, говорят о физике и химии об анатомии и биологии человека с божественных начал. Обе стороны в корне ошибались, потому что джадиды - узбеки, глубоко почитавшие ислам, но они же новые узбеки, считавшие, что верой нашей не ограничивается деятельность человека: для того, чтобы, допустим, получить хороший урожай с земли, надо знать и исполнять аграрную науку, а не предаваться лишь молитвам после сева /13, с. 45/.

Джадиды были вынуждены считаться с большевиками, потому что те были тогда – властью, отделившей государство от религии и религии от

школы. Но они, умышленно умалчивая свою связь с исламом, заявляли во всеуслышание: мы не против изучения Корана в школах, мы только за, но вместе с другими учебными предметами, открывающими молодым людям свет на все явления и события в пространстве и времени, дающие реальное понимание о мире и обществе людей. То есть мы в исламе и Коране видим воспитание души и совести человека, а в науках - созидание ума и эрудиции для будущего творчества и продвижения нации вперед /3, с. 43/.

Это значит, что джадидизм не есть субстанция, противоречащая и даже противодействующая исламу, а наоборот, она есть составная часть ислама, модернизирующая нашу веру на основе высказывания нашего пророка Мухаммада (мир ему): «Илм ибодатдан афзалдир». Ему вторят великие узбеки, Богоутдин Накшбанд: «Сердце богу, руки работе» и Абдурауф Фитрат: «Мы – мусульмане и до конца дней своих останемся ими. Однако если бы не усвоим все достижения мировой цивилизации, мы будем отсталой нацией» /1, с 29; 2, с. 56; 3, с. 106/

Если рассматривать историю создания джадидского течения, то сразу можно указать, что джадидизм возник внутри ислама в части его религиозного образования и воспитания духа и привлек к исламу новое, модернистское понимание в части развития ума и практических способностей человека посредством наук. И если мы обратимся к мировоззрению всех активных джадидов и известных наших лидеров, то с уверенностью скажем, что ни один из них не является безбожником, это глубоко верующие люди, зная, что исламская вера в отличие от религии несет свет, любовь и справедливость.

Большевики считают, что джадиды раньше были заодно с ними и вместе сражались против эмира в бухарской революции 1920 года. Это верно: на помощь слабеющим джадидам пришла Красная армия и создала решающий перелом, подвергнув огню, к великому несчастью для

бухарцев, всю столицу. Но цели обеих сторон были изначально разные: джадиды имели ввиду свергнуть эмира и установить буржуазную парламентскую республику на базе ислама, большевики хотели совсем другое – насаждение советской власти на базе социализма, планового хозяйства и новой ленинско – сталинской веры, которую назвали новым материалистическим и атеистическим мышлением. /8, с. 37/

Джадиды опять же в пику им заявляли во всеуслышание: Мы не смиримся с их диктатом, мы хотим провести буржуазные реформы, внедрить истинную, а не рабскую исламскую культуру в наше общество, подвергнуть молодежь росту национального самосознания, реформировать систему образования и просвещения, бороться против экономической отсталости, для чего включить в народное хозяйство рыночные механизмы и частную собственность, только так можно вытащить наш народ из болота нищеты, безграмотности и отсталости духа, от бездуховности и унижения /12, с. 30/.

За нами вся наша интеллигенция, все узбекские интеллектуалы, прогрессивная часть духовенства и лидеры местной буржуазии. Мы будем и дальше строить наши школы, готовить учителей по всем наукам, издавать книги и газеты, создавать библиотеки и театры. Но не это главное. Главное – взять власть в свои руки и реформировать экономику и общественных дух. Мы уже кое-чего добились и добиваемся: стали привлекать женщин к учебе и публичной работе, готовим кадры за рубежом, развиваем предпринимательство, банковское дело и торговлю, увеличиваем программную нагрузку на учащихся школ. Среди нас есть сильная группа мусульман – реформаторов, считающих своим долгом работать на благо прогресса узбекского общества, воспитывать и просвещать на основе просвещенного ислама, отвечающего нуждам современной цивилизации. Ислам не противоречит парламентаризму, в

основе идеи лежит Шуро Джамаат – совет мусульманской общины. Однако нужно искать новые формы и модели социального устройства на базе ислама .

Таким образом, ислам следует реформировать не только в культурной, но и в политической сфере. А это значит, например, развитие местного самоуправления, всеобщее избирательное право, свобода совести и свобода слова.

Когда же всё узбекское исламское общество пойдет за нами. Тогда только, когда с нашей помощью станет просвещенным и политически грамотным, когда будет понимать, что и как делать, сможет отстаивать свои интересы.

А грамотным и просвещенным можно стать только в наших джадилских школах, у нас за один год учащийся усваивает грамоту, чтение, письмо и четыре арифметических действия, такого нет в старых мактабах. А затем учащийся начнет читать наши газеты, они научат его правильно мыслить и рассуждать, он станет правильно анализировать происходящее в мире и своем обществе, а дадбше он постарается изучить иностранные языки, их знание введет егов мировую цивилизацию. Мы уже издаем свои газеты, у нас есть свои типографии, выпускающие наши учебники и другие книги.

В проекте модернизации ислама важную роль будет играть наша пресса. Мы будем давать точные и объективные, проверенные факты и комментарии к ним. И тогда читающие люди станут нашими единомышленниками, станут создавать сообщества по интересам, партии и движения. Мы и создали – то прессу для того, чтобы донести до масс свои прогрессивные идеи, это еще и нужно потому, чтобы нас не оболгали. Конечно газета должна быть платной, покупай и читай, а не можешь купить, иди в наши библиотеки, там наши газеты бесплатны.

Мы, джадиды, и внешне отличаемся стрижкой волос, усов и бород, европейским костюмом и очками. Мы всегда дружелюбны и способны прийти на помощь, не боимся беседовать с чужими женщинами в публичных местах, если они без паранджи, дарить им цветы и подарки. Но ни перед кем не встаем на колени и не лебезим, имеем чувство достоинства и чести. В нашей речи нет плохих слов, а тем более скверных ругательств. Мы в мечети ходим только на джума – намаз, мы считаем это достаточным, чтобы почтить Аллаха и испросить у него отпущение грехов. А в остальные дни мы молимся дома или на работе в перерывах на обед. Но мы соблюдаем все главные обязанности муслима, ведь это нужно нам, чтобы удерживать в себе самом чистый ангельский дух.

Из-за наших новшеств на нас набрасываются все духовники и отставшие, грозя нам шариатским судом. Но не мы, а они должны бояться праведного божьего и народного гнева, потому что они, а не мы, - стяжатели, мздоимцы, лицемеры, воры и лжецы. Нужно, чтобы и художественная литература активно влияла на умы. Ее пока мало, но уже есть великие произведения Бехбуди, Дониша, Фитрата, Айни. Они создают реальные образы, беря их из реальной жизни. У них в художественной форме обсуждаются социальные проблемы. Мы теперь думаем о театральных постановках, о драматургии, они, как и романы, рассказы и повести, формируют общественное сознание. Создаются театральные труппы Хамзы и Мухитдина Кори Екубова, мы приближаемся к европейскому пониманию действительности

Джадидизм должен был проникнуть во все поры ислама, а ислам должен был политизироваться. Исламское мировоззрение в узбекском обществе должно было осуществляться на основе джадидской философии. Другого пути нет, считали джадиды – иначе ислам погрязнет в нравоучениях и назиданиях бесчестной религии, не развиваясь творчески.

Вот так только джадидизм мог послужить исламу, как верный и сильный сын поможет встать с места старому немощному отцу. Вот тогда ислам стал бы научным, с одной стороны, и гуманистическим, с другой стороны, мировоззрением /9, с. 78/.

Но тут наступила главная опасность для джадидов и их сторонников и последователей – это широкое наступление советской власти на ислам и на его составную часть – джадидизм. В качестве альтернативы узбекскому народу предлагался атеизм, позиция, которой прикрывалась марксистско – ленинская идеология. Атеизм и марксизм – ленинизм по мысли большевиков должны были проникнуть во все поры узбекской народной души. Коммунисты хотели перехватить инициативу у джадидов, узбекское общество подвергалось мощному воздействию советской модели жизни. Джадиды должны были с этим бороться, иного пути у них нет, считали они, если мы хотим видеть счастливое будущее узбекского народа. Для этого, повторим, надо было исламизировать наше общество на базе джадидской философии и политизировать ислам.

Жизнь джадидов – уже великая и уже трагическая, они чувствовали, что их уничтожат, а последующие поколения их оболгут. Но они родились не для себя, они поняли свое значение и величие, когда стали работать для просвещения своего народа, это было главное на начальном этапе их пути. Они всегда с уважением и почтением относились к традициям и обычаям узбекского народа за его философскую, идеологическую и культурную константу. Но в их глазах замерзали слезы, когда они видели, как большевики убивают народную память и все эти константы, чтобы ничего не оставить от прежнего, разрушить всё и на прежних обломках построить новый разум человечества.

Мы сейчас живем в состоянии надрыва сердца и разрыва связок, но мы всё равно когда-нибудь возродимся в душе нации, когда она станет свободной и независимой, и многое надо будет пересмотреть и передумать.

Вот каковы примерно были размышления Файзуллы Ходжаева , он не излагал их на бумаге, хоть и считал манифестом джадидской партии, чекисты бумагу могли выкрасть и доставить куда следует, хоть держи в сейфе или любом потайном месте. Но и так было понятно, почему он стал неугоден Сталину. Но велел не трогать узбекского лидера, он ему был нужен, потому что был пока незаменим. Придет время – сочтемся, думал вождь. Время пришло, когда почувствовалось дыхание будущей большой войны, Сталин решил обезопасить себя от внутренних врагов (он их считал пятой колонной, кто, как придет военное лихолетье, повернет оружие против него) и объединить весь советский народ страхом перед ним, когда смерть слаще жизни, Вот почему началось уничтожение старых военных кадров и всех гражданских лиц, хоть как-то думающих иначе, чем он, в том числе лидеров местных компартий. Пришел 1938 год.

СПИСОК ЛИТЕРАТУРЫ

1. Валиханова В. С. Джадидизм: возникновение и сущность // История национальных политических партий России. — М., 1997.
2. Вахабов М. Г. О социальной природе среднеазиатского джадидизма и его эволюции в период великой октябрьской революции// История СССР.-1963.-№ 2.-С.35-56.
3. Гафаров Н. У. Культурно-просветительская деятельность джадидов в Бухарском эмирате, начало XX века. Душанбе, 1999. (автореферат)
4. Гафаров Н. У. Джадидизм в Средней Азии в конце XIX в. — начале XX в. Душанбе, 2014. (автореферат)
5. Косимов Б., Миллий уйгониш: жасорат, маърифат, фидойилик. Тошкент: Маънавият, 2002
6. Исхаков Д. М. Феномен татарского джадидизма: введение к социокультурному осмыслению.-Казань: Иман, 1997.-80с.
7. Маликов А. М. Самаркандские реформаторы начала XX века: Исаходжа Ширинходжаев // XXX международный конгресс по источниковедению и историографии стран Азии и Африки: к 150-летию академика В. В. Бартольда (1869—1930). Материалы конгресса. т.1. Спб.: Студия «НП-Принт», 2019. — с.473-475.

8. Махмудова Г. Т. Джадидское движение в Туркестане и его влияние на развитие нравственно-эстетической мысли: Автореферат дисс. канд.филос.наук.-Ташкенг, 1996.-26с.
9. Мирза-Ахмедова П. М., Рашидова Д. А. К изучению джадидского движения // Общественные науки в Узбекистане.- 1990.-№ 7.-С.30-40
10. Туркестанский Г. Кто такие были джадиды.-Ташкент,1926.-22с.
11. Хакимов Р. С. Джадидизм (реформированный ислам). — Казань: Институт истории АН РТ, 2010. — 208 с. ISBN 978-5-94981-153-5
12. Ходжаев Ф. Джадиды // Очерки революционного движения в Средней Азии,- М.,1926. -С.6-12
13. Худайкулов А. М. Просветительская деятельность джадидов Туркестана (конец XIX -начало XX вв.): Дисс.канд.ист.наук.-Ташкент, 1995,-148л.
14..Эргашев Б. Х. Из истории становления и развития общественно-политических идей джадидизма. Идеология младобухарцев: Дисс.д-ра филос.наук.-Бухара, 1993.-316с.

ПРЕЦЕДЕНТНЫЕ ТЕКСТЫ В ЯЗЫКЕ СОВРЕМЕННЫХ СМИ

Абдреймова Феруза Данияровна

Магистрант

Кафедра русской филологии

Узбекский Государственный Университет мировых языков

fabdreymova@gmail.com

Аннотация. В статье рассматривается понятие прецедентного текста и его основные признаки в современной лингвистике. Особое внимание уделяется роли прецедентных единиц в языке средств массовой информации, их экспрессивному потенциалу, смысловой многоплановости и способности формировать дополнительные культурные и ассоциативные значения. Анализируются основные виды прецедентных единиц, а также особенности их функционирования в современном медиадискурсе. Подчёркивается значение прецедентных текстов как эффективного средства привлечения внимания аудитории, выражения авторской оценки и создания языковой игры в медиатексте.

Ключевые слова: прецедентный текст, прецедентность, прецедентные единицы, медиадискурс, язык СМИ, медиатекст, экспрессивность, интертекстуальность, языковая игра, прецедентное имя.

В последние десятилетия прецедентные тексты стали одним из активно используемых средств создания экспрессивности в языке средств массовой информации. Усиление научного интереса к феномену прецедентности обусловило необходимость более детального изучения подобных языковых единиц, в том числе в рамках исследований медиадискурса и языка современных СМИ.

Термин «прецедентный текст» восходит к латинскому слову praecedens, означающему «предшествующий», «идущий впереди». В широкий научный обиход данное понятие было введено Ю. Н. Карауловым в 1986 году. Исследователь относит к прецедентным такие тексты, которые обладают познавательной и эмоциональной значимостью для личности, имеют надындивидуальный характер, известны широкому кругу представителей определённого языкового и культурного сообщества и неоднократно актуализируются в речи.

Одной из важнейших особенностей прецедентного текста является его узнаваемость. Такой текст должен быть знаком значительной части носителей языка и сохранять культурную актуальность в определённый исторический период. Наличие общих фоновых знаний позволяет адресату распознавать отсылку к исходному тексту и воспринимать не только непосредственное содержание высказывания, но и дополнительный смысл, заложенный автором.

В научной литературе существуют и другие подходы к определению данного понятия. Так, Г. П. Немец и Н. Н. Скрипникова рассматривают прецедентный текст как текст, который в процессе многократного употребления способен превращаться в устойчивое языковое клише и функционировать относительно независимо от первоначального

контекста. В результате переосмысления исходный текст частично утрачивает первоначальную семантическую целостность и приобретает новое значение в конкретной коммуникативной ситуации. По мнению исследователей, прецедентным может стать практически любой текст, если его содержание соответствует актуальным представлениям, ценностям и культурным ориентирам определённой эпохи. Прецедентные тексты обладают рядом характерных признаков. Прежде всего, они имеют надындивидуальный характер, то есть известны не отдельной личности, а значительной части языкового и культурного сообщества. Кроме того, такие тексты способны в краткой и концентрированной форме сохранять значительный объём культурной, исторической и смысловой информации. Они обладают познавательной и эмоциональной значимостью, неоднократно воспроизводятся в речи и имеют широкие возможности для создания языковой игры.

Особенно важным свойством прецедентных текстов является их высокий экспрессивный потенциал. Включение в новый текст элементов известного произведения, высказывания или культурного образа создаёт дополнительный смысловой план. Подобные отсылки могут усиливать образность текста, формировать подтекст, создавать иронический, комический, саркастический или иной эмоционально-оценочный эффект. Кроме того, использование прецедентных элементов позволяет переосмысливать привычные выражения и наделять их новыми культурными, социальными, публицистическими и иными значениями. Прецедентный текст можно рассматривать одновременно как речевое и языковое явление. С одной стороны, первоначально он представляет собой конкретное речевое произведение, имеющее определённый источник, автора и контекст. С другой стороны, в процессе многократного воспроизведения он может выходить за пределы исходного произведения,

становиться частью коллективного культурного знания и функционировать как относительно самостоятельная языковая единица. Для прецедентных текстов характерна смысловая многоплановость. Они сохраняют связь с первоначальным значением, однако в процессе дальнейшего употребления могут приобретать дополнительный, обобщённый смысл. Например, выражение «Это мы не проходили! Это нам не задавали!», получившее широкую известность благодаря советскому мультфильму, стало употребляться вне первоначального контекста как шутливое объяснение незнания, неподготовленности или недостаточной компетентности в каком-либо вопросе. Показательным примером функционирования прецедентности является роман Л. Н. Толстого «Анна Каренина». Само произведение может рассматриваться как прецедентный текст, поскольку оно широко известно в русскоязычном культурном пространстве. В то же время имя его главной героини — Анна Каренина — относится к прецедентным именам, так как вызывает у носителей языка устойчивый комплекс литературных и культурных ассоциаций.

При более узком понимании прецедентности выделяется несколько основных групп соответствующих единиц. К ним относятся общеизвестные цитаты и крылатые выражения, например «Счастливые часов не наблюдают», «Отчего люди не летают?», «Жди меня, и я вернусь». К прецедентным единицам относятся также строки из популярных песен, узнаваемые реплики героев кинофильмов, названия известных литературных, художественных, музыкальных и кинематографических произведений. Отдельную группу составляют прецедентные имена — имена реальных исторических и культурных деятелей, а также литературных и фольклорных персонажей, которые обладают устойчивой ассоциативной значимостью. К ним могут относиться, например, Пушкин,

Эйнштейн, Гамлет, Татьяна Ларина, Василиса Прекрасная и другие. Особую роль прецедентные тексты играют в современном медиадискурсе. Благодаря узнаваемости и высокой смысловой насыщенности они позволяют журналисту в лаконичной форме передавать дополнительную информацию, выражать авторскую оценку, создавать иронический или экспрессивный эффект и привлекать внимание аудитории. Особенно активно подобные единицы используются в газетных, журнальных и интернет-заголовках, где ограниченный объём текста требует максимальной информативности и выразительности. При этом авторы СМИ нередко не воспроизводят исходные выражения буквально, а трансформируют их, адаптируя к новой общественной, культурной или информационной ситуации.

СПИСОК ЛИТЕРАТУРЫ

1. Земская Е. А. Язык как деятельность: Морфема. Слово. Речь. - Москва. 2004.
2. Караулов Ю. Н. Русский язык и языковая личность. - Москва. 2002.
3. Мелерович А. М.. Мокиенко В. М. Фразеологизмы русской речи. Словарь: Около 1000 единиц. - Москва. 2001.
4. Немец Г. П.. Скрипникова Н. Н. Прецедентный текст и языковая игра как аспекты современной речевой практики / / Акценты. Новое в массовой коммуникации. Альманах.Выпуск 7-8 (42-43). - Воронеж. 2003. - С. 75-77.

ABU RAYHAN BERUNI'S WORK "THE CHRONOLOGY OF ANCIENT NATIONS" AS A UNIQUE SOURCE OF HISTORICAL ONOMASTICS

Mirzakhmedova Oygul Abdirashidovna

Doctor of Philosophy (PhD) in Philological Sciences,

Uzbek Language Teacher at TITU Namangan Branch

Tel.: +998973714072

Annotation: *This article studies Abu Rayhan Beruni's work "*The Chronology of Ancient Nation*s" as a unique and valuable source of historical onomastics. The linguistic, semantic and historical features of some historical onomastic units presented in the work are analyzed. The etymology of historical names used by Beruni, their inextricable connection with the traditions, religious beliefs, cultural values and worldview of ancient peoples are highlighted. It is also substantiated that the onomastic materials mentioned in the work serve as an important scientific source in the study of cultural ties, historical processes and ethnic relations between different peoples. The results of the study show that Beruni's legacy is of particular importance not only in historical onomastics, but also in the development of linguistics, history, ethnology and cultural studies.*

Key words: *onomastic units, anthroponym, geortonym, chrononym, cosmonym, etymology, toponym.*

INTRADUCTION

Al-Biruni's work entitled *The Chronology of Ancient Nations* was written in Arabic, and its lexical repertoire contains numerous onomastic units derived from Indian, Persian, Greek, Sogdian, Khwarazmian, and Turkic languages. Historical names associated with the peoples of ancient and medieval Transoxiana, Iran and Khurasan constitute important scholarly sources for the study of the region's past and the cultural heritage created by its ancestors. In terms of its content, *The Chronology of Ancient Nations* represents one of the earliest major works in the field of historical onomastics. The work contains

unique information concerning the formation, distribution, and transformation of ancient ethnonyms, toponyms, mythonyms, cosmonyms and anthroponyms. Our analysis shows that, in discussing the calendars, systems of reckoning years, festivals, and rituals of ancient peoples, Al-Biruni records hundreds of onomastic units associated with these cultural practices. For example, he provides the names of the months in the twelve-month calendar system of the ancient Iranian peoples, sacred days in Zoroastrianism, and the names of festivals observed by the ancient Sogdians and Khwarazmians. Our findings demonstrate that such material is significant not only for historical and ethnographic research but also for the study of onomastics. Al-Biruni's approach to the interpretation of names closely resembles linguistic analysis: he provides the etymology of numerous ancient words and explains their ethnic affiliation as well as the historical circumstances in which they emerged.

The work is particularly notable for the breadth and diversity of its onomastic material. On the one hand, Al-Biruni records the names of cities, regions, and countries associated with different peoples. In particular, he compares and analyzes toponyms used in Greek, Persian, Indian and other linguistic traditions. On the other hand, he systematically presents the names of historical and legendary figures and deities, relates them to contemporary religious beliefs, and seeks to illuminate the religious and intellectual worldview of different peoples through the study of proper names.

Al-Biruni's work has preserved a number of rare ethnonyms and toponyms that are not attested in Persian, Arabic or Turkic sources. For example, certain names associated with the ancient Khwarazmian calendar, although not recorded in later sources, have survived through *The Chronology of Ancient Nations* [2, 1009].

In this respect, the work is of exceptional significance for reconstructing the ancient onomastic system of the peoples of Central Asia. It should be

emphasized that Al-Biruni does not merely enumerate names; rather, he examines their phonetic forms, semantic meanings, and historical origins. This approach is remarkably consistent with the principles of modern onomastic methodology. Al-Biruni's scholarly legacy demonstrates that he regarded names not merely as labels or identifiers, but as cultural symbols reflecting a people's historical memory, cultural identity, and religious worldview.

By their very nature, onomastic units are linguistic elements that are generally transferred into other languages without translation and constitute one of the most stable and least variable components of a language. Owing to this characteristic, the onomastic units recorded in *The Chronology of Ancient Nations* constitute highly reliable and authoritative evidence for historical and linguistic research. The system of proper names represents a substantial component of the lexical structure of *The Chronology of Ancient Nations*, whose text contains numerous historical anthroponyms, geortonyms, cosmonyms, toponyms, and mythonyms.

In many of his scholarly studies, H. Hasanov systematically analyzes the historical toponyms and hydronyms recorded in Al-Biruni's works, explaining their processes of formation, semantic characteristics, and relationship to historical sources. Through these onomastic units, the scholar seeks to identify the cultural environment, historical realities, and geographical features of past periods [4, 47–94].

Al-Fir is the name of the ancient capital of Khwarazm, located on the left bank of the Amu Darya. In Arabic written sources, it is also referred to as Al-Mansura. According to Al-Biruni, Al-Fir was a fortress on the outskirts of the city of Khwarazm, constructed of mud and unbaked bricks. It consisted of three concentric fortified structures, each built within the other and approximately equal in height:

"Al-Fir was a fortress on the outskirts of the city of Khwarazm, built of mud and unbaked bricks. It consisted of three concentric fortified structures, each enclosed within the other and equal in height. Al-Fir could be seen from a distance of approximately ten miles or more. The Jayhun [Amu Darya] destroyed, demolished, and carried away parts of it every year; eventually, in the 1305th year of the history of Alexander, not a trace of it remained" [1, 69].

The toponym consists of two morphemes: **al-**, the Arabic definite article, and **fir**, whose underlying root can be traced back to ancient Khwarazmian and Iranian languages. According to Al-Biruni, the local population referred to the place as **Pir** or **Pur**. In ancient Iranian languages, *pur* denoted a "fortress," "stronghold," or "protected place."

In his study entitled *Linguistic Features of Uzbek Cosmonyms*, A. Primov notes that Al-Biruni not only discusses the nature and movements of astronomical bodies but also provides valuable information about the principles underlying their naming and their etymologies. A. Primov further argues that some of the Arabic and Turkic cosmonyms mentioned in Al-Biruni's works continue to be actively used in the modern Uzbek language.

The Chronology of Ancient Nations contains information about a constellation known in the Khwarazmian language as ***Azvapachkirik***: "The Khwarazmians were more knowledgeable about the zodiacal signs than the Arabs. The names they gave to the zodiac corresponded to the names assigned by those [astronomers] responsible for representing them and did not conform to the Arabic [language]. The Arabs, meanwhile, depicted them through figures different from those represented in the images assigned by the authorities. This demonstrates the correctness of our statement. For example, the Arabs placed Jawza among the zodiacal signs in the form of two twin boys. However, Jawza is the star of the Giant. The Khwarazmians call this constellation Azvapachkirik. This means "he Twins" [1, 267].

Surayya is the name of a group of stars. It consists of six stars clustered together and closely resembles a bunch of grapes: Surayya [is] a diminutive form of "sarva" and is originally derived from "sarva". "Sarva" carries the meanings of "to gather" and "a large number". According to the belief of some [Arabs], the reason these [stars] were given this name is that rain falls when they set, producing "sarva", that is, abundance and prosperity. [These stars] are also called Najm [1, 393].

Surayya is the Arabic name for the group of stars known as the **Pleiades**. The term is generally used to refer to this prominent and bright star cluster in the night sky. *Sarva* in Arabic conveys the meanings "to gather" and "to be numerous". The cosmonym is derived from this root and denotes a "cluster of numerous small stars" or a "group of gathered stars". It was believed that rain fell when the Pleiades set. Since rain increased the harvest and brought prosperity (*sarva*), it was thought that the star cluster had acquired this name for this reason. This belief represents an ancient astronomical and agricultural tradition associated with folk beliefs concerning fertility and harvests.

X. Salikhodjayeva recognizes *The Chronology of Ancient Nations* by Al-Biruni as one of the historical sources for the study of Uzbek chrononymy and geortonymy and examines the names of pre-Islamic festivals of Khwarazm and Sogd mentioned in the work [3, 56]. The work also records that during the time of the Prophet Muhammad, people did not designate years by numerical names but referred to them by names such as the "Year of Peace", the "Year of Victory" and the "Year of Famin".

Al-Biruni also describes a Persian custom of presenting sugar to one another during the festivals of ***Nowruz*** and ***Mehrjan***, based on the account of Ozarbod, the Magian priest of Baghdad: "Among the Persians, it was customary to present sugar to one another on the day of Nowruz. According to the account of Ozarbod, the Magian priest of Baghdad, the reason for this was that on the

day of Nowruz, sugar cane appeared in the kingdom of Jamshid, although it had not been known until that time. Jamshid saw juice dripping from a fresh cane. When he pulled it out and discovered that it contained a delicious sweetness, he ordered its juice to be extracted and sugar to be produced from it. The sugar was harvested on the fifth day, and people presented it to one another as a means of offering congratulations. The same custom was also observed during the festival of Mehrjan" [1, 241].

A systematic analysis of the onomastic units used in Al-Biruni's works on the basis of contemporary linguistic paradigms makes it possible to draw conclusions not only about linguistic phenomena but also about the history, geography, and cultural studies of interethnic sociopolitical, economic, and cultural relations; interaction among languages; the linguistic situation and environment; the sources of formation of the system of proper names; linguistic and extralinguistic factors; historical and etymological layers; variants; development; and formal and semantic evolution.

The scholarly legacy of Al-Biruni, one of the major representatives of the First Renaissance of Central Asia, is being studied not only in Uzbekistan but also internationally. Research and scholarly investigations continue within the field of onomastics as well. In particular, A. Mirboboyev and Y. Boboyev analyze the Arabic, Persian, Khwarazmian, and Rumi names of planets mentioned in the work and note that certain Sogdian and Khwarazmian cosmonyms have been preserved in the Tajik language [5].

In conclusion, *The Chronology of Ancient Nations* can be regarded as a unique encyclopedia of historical onomastics. The system of names presented in the work, together with Al-Biruni's analyses and explanations, remains one of the most reliable sources for the study of ancient languages, peoples, and cultures. Therefore, it is both reasonable and well-founded to regard this work as an invaluable contribution to the development of historical onomastics.

REFERENCES

1. Абу Райҳон Беруний. Қадимги халқлардан қолган ёдгорликлар. Танланган асарлар. 1-жилд. – Тошкент: O‘zbekiston, 2020.

2. Mirzaxmedova O. Beruniyning “Qadimgi xalqlardan qolgan yodgorliklar” asaridagi o‘z qatlamga oid ayrim onomastik birliklar xususida // NamDU ilmiy axborotnomasi.11-son. – Namangan, 2025.

3. Салиходжаева Х. Ўзбек тили хрононим ва геортонимларининг лисоний тадқиқи: Фил. фанлари бўйича фалсафа доктори (PhD) ... дисс. – Фарғона, 2020.

4. Ҳасанов Ҳ. Сайёҳ олимлар. – Тошкент: Ўзбекистон, 1981. – Б. 47-94.

5. https://cyberleninka.ru/article/n/aburayhon-berunis-information-concerning-cosmonimy-of-iranian-speaking-people/viewer.

PHONOLOGICAL AND ORTHOGRAPHIC ADAPTATION OF ENGLISH LOANWORDS IN UZBEK AND KOREAN: A COMPARATIVE ANALYSIS

Rakhmanova Sanobar Madaminovna

Teacher

Urganch State University named after Abu Rayhan Beruni

s.raxmanova82@gmail.com

Abstract: *This article examines the phonological and orthographic adaptation of English loanwords in Uzbek and Korean from a comparative perspective. It focuses on the ways borrowed lexical items are modified to conform to the phonological, syllabic, and orthographic systems of the recipient languages. The study identifies common and language-specific patterns of adaptation and considers the relationship between pronunciation, phonotactic constraints, and writing systems. The analysis shows that English loanwords undergo systematic adaptation in both languages, while the extent and form of adaptation are influenced by the structural characteristics of Uzbek and Korean. Particular attention is given to the role of the Latin-based writing system in Uzbek and Hangul in Korean in shaping the orthographic representation of borrowed vocabulary. The findings contribute to a clearer understanding of phonological and orthographic integration of English lexical items in the two recipient languages.*

Keywords: *English loanwords, phonological adaptation, orthographic adaptation, Uzbek, Korean, loanword integration, phonotactics, comparative linguistics.*

INTRODUCTION

Language contact is one of the important sources of lexical change. English has become a major donor language in such fields as technology, business, education, sport, science, and digital communication. When English lexical items enter another language, they are rarely reproduced without modification. Their pronunciation, syllable structure, and written representation may change according to the phonological and orthographic norms of the

recipient language. Studies of Korean loanwords particularly demonstrate the interaction between phonetic perception, phonological structure, and spelling in the adaptation process.

Uzbek and Korean provide an informative basis for comparison because both languages adapt English vocabulary within their own linguistic systems. However, the mechanisms of adaptation differ considerably. Uzbek uses a Latin-based alphabet, while Korean uses Hangul, meaning that English words require a more substantial orthographic transformation in Korean. This article therefore compares selected English loanwords in Uzbek and Korean, focusing specifically on phonological and orthographic adaptation.

Phonological adaptation in Uzbek

In Uzbek, English loanwords may undergo pronunciation changes when they become established in ordinary usage. The adaptation is influenced by the phonological structure of Uzbek and by the established pronunciation of the borrowed item. For example, *computer* is commonly represented as **kompyuter**, while *internet* is represented as **internet**. The English consonant and vowel sequences are therefore interpreted through Uzbek phonological patterns. In addition, borrowed nouns can subsequently participate in Uzbek grammatical processes, although such morphological integration is beyond the primary scope of this article.

Another characteristic is that Uzbek often retains a relatively recognizable relation between the English written form and the Uzbek Latin-script form. Consequently, orthographic adaptation may be less visually extensive than in Korean. Nevertheless, differences in spelling and pronunciation may arise as a borrowed form becomes conventionalized in Uzbek usage.

Phonological and orthographic adaptation in Korean

Korean demonstrates a more visible transformation because English loanwords are normally represented in **Hangul**. Thus, *computer* becomes

컴퓨터 (keompyuteo), *internet* becomes **인터넷 (inteonet)**, and *sport* becomes **스포츠 (seupocheu)**. These forms do not reproduce English spelling; rather, they represent the borrowed pronunciation within the Korean writing system and syllable structure.

A particularly important feature is the treatment of consonant clusters and syllable structures that are not compatible with Korean phonotactics. English forms may therefore receive additional vowel material or undergo consonant substitution. Research on Korean loanwords has shown that such adaptations are related to both Korean phonological constraints and the perception of English sounds.

Comparative analysis

The comparison indicates both similarities and differences between the two recipient languages. In both Uzbek and Korean, English loanwords are adapted rather than simply transferred unchanged. Phonological adaptation may involve substitution of sounds and adjustment to recipient-language phonotactics. The major difference concerns orthographic representation. Uzbek generally uses the Latin alphabet, so forms such as **kompyuter** and **internet** remain visually related to their English counterparts. Korean, in contrast, represents these items as **컴퓨터** and **인터넷**, requiring complete conversion into Hangul. Previous research also indicates that orthographic information can influence the pronunciation of English loanwords in Korean.

English	Uzbek	Korean	Main adaptation
computer	**kompyuter**	컴퓨터	phonological + orthographic
internet	**internet**	인터넷	orthographic + phonological

Sport	**sport**	스포츠	syllabic + orthographic
Taxi	**taksi**	택시	phonological + orthographic

These examples should be understood as representative cases rather than as a complete inventory of English loanwords. The comparison demonstrates that the same donor-language item can acquire different surface forms depending on the phonological and writing-system requirements of the recipient language.

CONCLUSION

The comparative analysis demonstrates that English loanwords undergo systematic adaptation in both Uzbek and Korean. In Uzbek, adaptation is generally visible through pronunciation and conventionalized Latin-script spelling, whereas Korean adaptation involves both phonological restructuring and obligatory representation through Hangul. Korean loanwords particularly illustrate the role of syllable structure, phonotactic restrictions, perception, and orthographic influence. Thus, phonological and orthographic adaptation should be considered important indicators of the integration of English lexical material into recipient languages.

REFERENCES

1. Haugen, E. (1950). The Analysis of Linguistic Borrowing. *Language, 26*(2), 210–231.
2. Kang, Y. (2010). The emergence of phonological adaptation from phonetic adaptation: English loanwords in Korean. *Phonology, 27*(2), 225–253.
3. Kim, S.-C. (2010). Three issues on the adaptation process of loanword formation: With reference to English loanwords in Korean. *Linguistics, 57*, 213–228.
4. Nam, J. Y., & Southard, B. (1994). Orthographic representation and resyllabification of English loanwords in Korean. *Phonetica, 37*(3).
5. Matras, Y. (2009). *Language Contact*. Cambridge University Press.
6. Weinreich, U. (1953). *Languages in Contact: Findings and Problems*. Linguistic Circle of New York.
7. Baxbergenova, A. (2026). Koreys tiliga ingliz tilidan so‘z o‘zlashish tarixi, o‘zlashish sabablari va yo‘llari. *ACTA NUUz*. DOI: 10.69617/nuuz.v1i1.4.11486.

Imprint Information

Approved for printing on September 20, 2026

Total volume: 23 printed sheets

Format: 60 × 84 1/8

Print run: Electron copies

www.academscience.com

Order No.: 24.4

Published by

ACADEMICRESEARCHPUBLISHERLTD

INTERNATIONAL CONFERENCE ON GLOBAL RESEARCH AND INNOVATION (ICGRI-2026)

20.09.2026 | Tashkent, London



www.academscience.com

zenodo | OpenAIRE