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MATERIALS
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«SUSTAINABLE DEVELOPMENT, ARTIFICIAL INTELLIGENCE AND GLOBAL INNOVATION»

London, Tashkent
July 20, 2026

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Sustainable development, artificial intelligence and global innovation // materials international scientific-practical conference. London, United Kingdom. July 20, 2026.

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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 (July 18, 2026, Protocol No. 20.1).

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1-SECTION

XORAZM VILOYATI POMIDOR AGROTSENOZIDA KO‘P UCHROVCHI ENTOMOFAUNA VAKILLARI

Allabergenova Shaxlo Allaberganovna

Al-Beruniy nomidagi Urganch davlat universiteti tayanch doktoranti

Annotatsiya*: Ushbu maqolada Xorazm viloyati sharoitida pomidor agrotsenozlarida uchraydigan entomofauna vakillarining turlari, ularning biologik xususiyatlari, fenologik davriyligi va o‘simlik rivojlanish bosqichlariga ta’siri ilmiy jihatdan tahlil qilingan. Tadqiqotda entomofaunaning ekologik ahamiyati, foydali va zararli hasharotlar o‘rtasidagi biologik muvozanat, shuningdek, entomokompleks tarkibining mavsumiy dinamikasi yoritilgan. Natijalar pomidor ekinlarida barqaror agroekotizimni shakllantirish, biologik himoya usullarini takomillashtirish hamda zararli hasharotlarni ekologik nazorat ostida ushlab turish uchun ilmiy asos bo‘lib xizmat qiladi.*

Kalit so‘zlar: *entomofauna, pomidor agrotsenozi, Xorazm viloyati, biologik muvozanat, foydali hasharotlar, zararli hasharotlar, ekologik nazorat, agroekotizim.*

Abstract: *This article scientifically analyzes the species of entomofauna representatives found in tomato agrocenoses in the conditions of the Khorezm region, their biological characteristics, phenological periodicity and impact on plant development stages. The study highlights the ecological significance of entomofauna, the biological balance between beneficial and harmful insects, as well as the seasonal dynamics of the composition of the entomocomplex. The results serve as a scientific basis for the formation of a stable agroecosystem in tomato crops, the improvement of biological protection methods, and the maintenance of harmful insects under ecological control.*

Keywords: *entomofauna, tomato agrocenosis, Khorezm region, biological balance, beneficial insects, harmful insects, ecological control, agroecosystem.*

Xorazm viloyati O‘zbekistonning eng muhim agrar hududlaridan biri bo‘lib, bu yerda pomidor ekinlari keng maydonlarda yetishtiriladi. Viloyatning iqlim sharoiti — yozda yuqori harorat, past namlik va uzoq quyoshli kunlar — pomidor o‘sishi uchun qulay bo‘lishi bilan birga, hasharotlar, ayniqsa entomofauna vakillarining faol rivojlanishi uchun ham mos sharoit yaratadi. Pomidor agrotsenozlarida entomofaunaning turlari, soni va ularning ekologik rollarini o‘rganish nafaqat agronomik, balki ekologik jihatdan ham muhim

ahamiyat kasb etadi. Chunki entomofauna o‘simliklarning changlanishida, zararkunandalar populyatsiyasini tabiiy nazoratda ushlab turishda, hamda agroekotizimning tabiiy barqarorligini saqlashda hal qiluvchi rol o‘ynaydi.

Xorazm viloyatining pomidor agrotsenozlarida uchraydigan entomofauna vakillari turli trofik guruhlarga mansub bo‘lib, ular orasida zararli, foydali va neytral turlar mavjud. Zararli hasharotlar orasida eng ko‘p uchraydiganlari pomidor shiralari (*Aphis gossypii*), o‘simlik bitlari (*Myzus persicae*), pomidor mo‘ylovkasi (*Tuta absoluta*), oqkanotli hasharot (*Trialeurodes vaporariorum*), tripslar (*Thrips tabaci*), va o‘simlik qurtlari (*Helicoverpa armigera*) hisoblanadi. Ushbu turlar o‘simliklarning barglari, gullari va mevalariga jiddiy zarar yetkazib, hosildorlikni sezilarli kamaytiradi. Ayniqsa *Tuta absoluta* turlari pomidor agrotsenozida xavfli zararkunanda sifatida tanilgan bo‘lib, u barglar ichiga tuxum qo‘yadi, lichinkalari esa barg to‘qimalarini yemiradi. Natijada fotosintez jarayoni izdan chiqadi, o‘simlikning umumiy fiziologik holati yomonlashadi.

Biroq entomofaunaning barcha vakillari zararli emas. Pomidor agrotsenozida foydali hasharotlarning mavjudligi tabiiy biologik nazorat mexanizmini shakllantiradi. Masalan, *Coccinellidae* oilasiga mansub qo‘ng‘izlar (xususan, *Coccinella septempunctata*), *Chrysopidae* oilasiga mansub oltin ko‘zchalar, hamda parazit ari turlari (*Encarsia formosa*, *Trichogramma evanescens*) shira, oqkanotli va tripslarning tabiiy dushmanlari hisoblanadi. Ular agrotsenozda biologik muvozanatni ta’minlab, kimyoviy pestitsidlar qo‘llash zaruratini kamaytiradi. Ayniqsa, foydali entomofauna sonining ko‘payishi agroekotizimda barqarorlikni ta’minlaydi va ekologik toza mahsulot yetishtirish imkonini beradi.

Pomidor agrotsenozidagi entomofauna tarkibi mavsumiy o‘zgarishlarga ham bog‘liq. Bahor oylarida asosan changlatuvchi va o‘simlik bitlari ustunlik qilsa, yoz o‘rtalariga kelib, yuqori harorat va past namlik sharoitida tripslar va oqkanotli hasharotlar faol bo‘lib qoladi. Kuz faslida esa *Tuta absoluta* va *Helicoverpa armigera* populyatsiyasi keskin oshadi. Bu davrda pomidorning

vegetativ qismlari to‘liq shakllanib bo‘lganligi sababli, zararkunandalar aynan meva bosqichiga jiddiy ta’sir ko‘rsatadi. Tadqiqotlar shuni ko‘rsatadiki, Xorazm viloyati sharoitida pomidor agrotsenozlarida entomofaunaning umumiy soni vegetatsiya davomida bosqichma-bosqich oshib, iyul–avgust oylarida eng yuqori nuqtaga yetadi.

Entomofauna vakillarining biologik faoliyati o‘simlik rivojlanish bosqichlariga ham bevosita ta’sir ko‘rsatadi. Pomidorning boshlang‘ich o‘sish bosqichida (ko‘chat paytida) asosan shira va tripslar faol bo‘ladi, ular o‘simlikning yosh barglarini so‘rib, o‘sish sur’atini sekinlashtiradi. Gullash davrida esa changlatuvchi hasharotlar, masalan, asalarilar va yovvoyi arilar faol bo‘lib, hosil bog‘lanishini ta’minlaydi. Meva hosil bo‘lish davrida esa pomidor mo‘ylovkasi va oqkanotli hasharotlar soni ortadi, bu esa o‘simlikning meva sifati va miqdoriga salbiy ta’sir qiladi. Shunday qilib, entomofaunaning har bir trofik guruhi pomidor agrotsenozida o‘ziga xos ekologik rol o‘ynaydi.

Ekologik muvozanatni saqlash maqsadida, Xorazm viloyatida ko‘plab fermer xo‘jaliklari kimyoviy kurash o‘rniga biologik nazorat usullariga o‘tmoqda. Bu usullarga foydali entomofauna vakillarini sun’iy ko‘paytirish va agrotsenozga kiritish, zararkunandalarning tabiiy dushmanlarini saqlab qolish, hamda agrotexnik tadbirlarni to‘g‘ri olib borish kiradi. Misol uchun, foydali hasharotlarni jalb qilish uchun agrotsenoz atrofida nektarli o‘simliklar ekilishi, pestitsidlar faqat zarur holatlarda va selektiv shaklda qo‘llanilishi lozim. Shuningdek, *Trichogramma* turlarining tuxum parazitligi tufayli pomidor mo‘ylovkasining tarqalish darajasi 35–45% gacha kamayishi kuzatilgan.

Tadqiqotlar shuni ko‘rsatmoqdaki, Xorazm viloyati pomidor agrotsenozida entomofauna turlari tarkibi yuqori darajada diversifikatsiyalashgan bo‘lib, ularning umumiy soni 40 dan ortiq turga yetadi. Shundan 25% foydali, 60% zararli va 15% neytral turlarni tashkil etadi. Foydali turlar sonining nisbatan kamligi antropogen ta’sir, pestitsidlardan haddan tashqari foydalanish va tabiiy yashash joylarining qisqarishi bilan bog‘liq. Shu sababli, biologik himoya konsepsiyasini rivojlantirish, foydali entomofauna

populyatsiyasini tiklash hamda ekotizimning tabiiy muvozanatini saqlash dolzarb masala hisoblanadi.

Pomidor agrotsenozidagi entomofauna o‘rganish nafaqat zararli turlarni aniqlash, balki ularning tabiiy dushmanlarini aniqlash, biologik kurash strategiyalarini ishlab chiqish va ekologik xavfsizlikni ta’minlash nuqtai nazaridan ham muhimdir. Har bir trofik daraja o‘rtasida o‘zaro bog‘liqlik mavjudligi sababli, entomofauna tarkibidagi o‘zgarishlar pomidor agrotsenozining umumiy barqarorligiga bevosita ta’sir ko‘rsatadi. Shu boisdan, Xorazm viloyati sharoitida entomofaunaning ekologik va bioindikativ ahamiyatini o‘rganish pomidor yetishtirishda samaradorlikni oshirishga, pestitsidlar miqdorini kamaytirishga va ekologik toza mahsulot olishga xizmat qiladi.

Yakuniy xulosa sifatida ta’kidlash joizki, Xorazm viloyatining pomidor agrotsenozlari murakkab entomokompleksga ega bo‘lib, ularning o‘zaro ekologik aloqalari tabiiy muvozanatni belgilovchi asosiy omillardan biridir. Entomofaunaning turli vakillarini kompleks o‘rganish orqali agroekotizimni barqaror boshqarish imkoniyati yaratiladi. Shuningdek, ekologik barqaror agrotexnologiyalarni joriy etish, foydali hasharotlarni muhofaza qilish va ularning sonini ko‘paytirish orqali Xorazm viloyatida pomidor yetishtirishda yuqori samaradorlikka erishish mumkin.

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MAXIMUM ANGULAR VELOCITY OF THE LEFT HOOK PUNCH IN AN ELITE PROFESSIONAL BOXER: A THREE-DIMENSIONAL KINEMATIC ANALYSIS OF SEGMENTAL ANGULAR SPEED

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Annotatsiya. *Mazkur maqolada elita professional yarim o'rtacha vazn toifasidagi boksyor tomonidan bajarilgan chap qo'l bilan hook zarba davomida tana segmentlarining maksimal burchak tezligi uch o'lchamli harakatni qayd etish (STT Systems 3DMA, 19 markerli to'plam, 240 Hz, 90 soniyalik yozuv) yordamida tahlil qilingan. Tos, chanoq-son, tizza, to'piq, yelka va tirsak bo'g'imlarining maksimal burchak tezligi ko'rsatkichlari taqqoslangan. Natijalar chap tomon bo'yicha eng yuqori burchak tezligi tosning chap segmentida (453,85 °/s) qayd etilgani, undan keyin tirsak (159,46 °/s) va tizza (123,07 °/s) bo'g'imlari ekanligini ko'rsatdi. Bu natijalar chap hook zarbasida kuchning asosiy manbai tos-tana aylanishi ekanligini va bu energiya proksimal-distal kinetik zanjir orqali tirsakka uzatilishini tasdiqlaydi. Olingan ma'lumotlar texnik murabbiylik hamda boksyorlarda zarba tezligini optimallashtirish bo'yicha amaliy tavsiyalar uchun asos bo'lishi mumkin.*

Kalit so'zlar: *boks biomexanikasi, hook zarba, burchak tezligi, kinetik zanjir, uch o'lchamli kinematika, elita sportchi.*

Аннотация. *В статье представлен анализ максимальной угловой скорости сегментов тела при выполнении хука левой рукой элитным профессиональным боксёром полусреднего веса с использованием трёхмерного захвата движения (STT Systems 3DMA, набор из 19 маркеров, 240 Гц, запись длительностью 90 секунд). Сопоставлены показатели максимальной угловой скорости таза, тазобедренного, коленного, голеностопного, плечевого и локтевого суставов. Результаты показали, что наивысшая угловая скорость по левой стороне тела зафиксирована в левом сегменте таза (453,85 °/с), далее следуют локтевой (159,46 °/с) и коленный (123,07 °/с) суставы. Эти данные подтверждают, что основным источником силы хука левой рукой является ротация таза и туловища, энергия которой передаётся через проксимально-дистальную кинетическую цепь к локтевому суставу. Полученные*

результаты могут быть полезны для технической подготовки тренеров и оптимизации скорости удара у боксёров.

Ключевые слова: *биомеханика бокса, хук, угловая скорость, кинетическая цепь, трёхмерная кинематика, элитный спортсмен.*

Annotation. *This article presents an analysis of the maximum segmental angular velocity recorded during a left-hand hook punch performed by an elite professional welterweight boxer, using three-dimensional motion capture (STT Systems 3DMA, 19-marker set, 240 Hz, 90-second recording). Maximum angular speed values for the pelvis, hip, knee, ankle, shoulder, and elbow were compared. The results showed that the highest angular speed on the left side of the body occurred at the left pelvis segment (453.85°/s), followed by the elbow (159.46°/s) and knee (123.07°/s) joints. These findings confirm that pelvis-trunk rotation is the principal source of power for the left hook, with energy transmitted through a proximal-to-distal kinetic chain toward the elbow. The results may be useful for technical coaching and for optimising punch speed in boxers.*

Keywords: *boxing biomechanics, hook punch, angular velocity, kinetic chain, three-dimensional kinematics, elite athlete.*

INTRODUCTION

Punching power in boxing is not generated by the arm in isolation but through a coordinated, sequential rotation of body segments known as the kinetic chain, in which energy generated by the larger, more proximal segments (legs, pelvis, trunk) is transferred through the trunk and shoulder girdle to the smaller, more distal segments (arm, forearm, fist) [1,3]. This sequential pattern, often referred to as the principle of summation of speed, allows each successive segment to begin its motion with the velocity already generated by the segment preceding it, so that the distal endpoint — the fist — reaches its highest velocity at the moment of impact [3,8].

Angular velocity, expressed in degrees per second, is one of the primary kinematic variables used to quantify how effectively this energy transfer occurs at each joint. Compared to joint angle alone, angular velocity captures the dynamic, time-dependent character of the movement and is therefore considered more directly related to striking power and technique efficiency [1,2]. Previous kinematic studies of boxing punches have generally focused on straight punches

and jabs, given their relative mechanical simplicity and the ease of isolating a single, largely sagittal-plane movement [1,4]. The hook, by contrast, involves substantial transverse-plane rotation of the pelvis and trunk combined with simultaneous flexion/extension and abduction/adduction at the shoulder and elbow, making its kinetic chain considerably more complex to characterise [2,5].

Force-based and dynamometric studies have established that punching force is strongly associated with lower-body drive and hip rotation rather than upper-limb strength alone [7,8], and studies using inertial sensors have quantified hand speed as a proxy for striking performance [11]. However, direct three-dimensional angular velocity profiles of the hook punch, broken down by individual joint and expressed across the full kinetic chain from pelvis to fist, remain scarce in the literature — particularly for elite professional boxers competing at world level [1,4,9].

Characterising the segmental angular velocity profile of the hook punch has both theoretical and applied value. From a theoretical standpoint, it allows verification of the proximal-to-distal sequencing principle in a rotational (rather than purely linear) striking technique [3]. From an applied standpoint, identifying which joints contribute most to angular speed generation, and which segments may represent a 'weak link' in the chain, can inform individualised strength and conditioning programming as well as technical coaching cues aimed at improving punch speed and power [8,10].

The purpose of this study was to quantify and describe the maximum segmental angular velocity of the pelvis, hip, knee, ankle, shoulder, and elbow during a left-hand hook punch performed by an elite professional welterweight boxer, using three-dimensional motion capture, and to interpret these values in the context of proximal-to-distal kinetic chain sequencing.

MATERIALS AND METHODS.

Full-body kinematic data were captured using a three-dimensional motion analysis system (STT Systems 3DMA) with a 19-marker full-body set, sampled at 240 Hz over a continuous 90-second recording (Full-body analysis (19p)

protocol; recording date 2026-07-11). The system's software automatically computed, for each tracked joint, the maximum angular speed (°/s) attained over the recorded interval, alongside maximum/minimum joint angles and phase-specific angular values.

Because the 90-second recording captured a continuous sequence of technical actions rather than a single isolated repetition, the maximum angular speed values reported by the system for each joint represent the peak value attained at any point during the recording session, and are not guaranteed to originate from the same single left hook repetition analysed in the companion case study of this series. This is an important methodological limitation: for joints on the non-punching (right) side, in particular the shoulder (497.43°/s and 547.53°/s with vertical reference), the recorded maxima are markedly higher than would be expected from a stabilising guard-arm role during a left hook, and most plausibly reflect a faster action recorded elsewhere in the session (e.g., a jab or straight right). These right-side shoulder values are therefore reported for completeness but are not interpreted as characteristic of the left hook technique.

The software's gait/running-specific temporal and spatial output fields (cadence, flight time, step length, and related parameters) were populated using a locomotion analysis template not designed for punching actions; these fields returned non-physiological or zero values for a stationary striking task and were therefore excluded from analysis as not applicable to the present study.

Segmental angular velocities were extracted for the pelvis (rotation, left and right segments), hip (flexion/extension, abduction/adduction), knee (flexion/extension), ankle (flexion/extension), shoulder (flexion/extension, flexion/extension referenced to vertical, abduction/adduction), and elbow (flexion/extension), for both the left (punching) and right (guard) sides. Left-side values were treated as the primary variables of interest for characterising the left hook kinetic chain, consistent with the technique under study.

RESULTS

Table 1 presents the maximum angular speed recorded for each segment/joint, for the left and right sides. Figure 1 illustrates the left-side values ordered proximal to distal (pelvis → hip → knee → ankle → shoulder → elbow).

On the left (punching) side, the highest maximum angular speed by a substantial margin was recorded at the pelvis (left segment rotation), at 453.85°/s. This was followed, in descending order of magnitude, by the elbow flexion/extension (159.46°/s), knee flexion/extension (123.07°/s), hip flexion/extension (71.48°/s), ankle flexion/extension (61.87°/s), hip abduction/adduction (44.96°/s), shoulder abduction/adduction (27.03°/s), and shoulder flexion/extension referenced to vertical (33.08°/s) and to the anatomical axis (23.87°/s).

The pelvic rotation value was approximately 2.8 times greater than the next-highest left-side segmental value (elbow flexion/extension) and approximately 6.4 times greater than the lowest left-side shoulder value recorded, indicating that pelvis-trunk rotation was, by a clear margin, the dominant contributor to angular speed generation on the punching side. Notably, the left elbow attained a higher maximum angular speed than any of the left shoulder measures, suggesting that the terminal 'whip-like' extension of the forearm contributed more to distal angular speed than shoulder joint rotation itself, consistent with a rotational technique in which shoulder girdle and trunk rotation — captured primarily through the pelvis metric — drives the arm, while the elbow contributes the final acceleration of the fist.

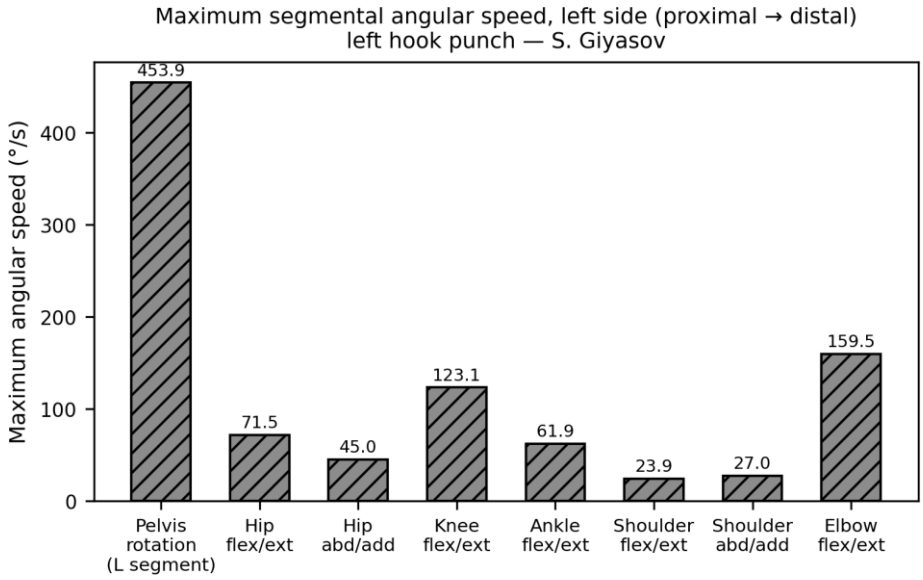

Figure 1. Maximum segmental angular speed, left side, ordered proximal to distal (pelvis → elbow), left hook punch.

Table 1

Maximum angular speed by segment/joint, left and right sides

Segment / Joint (angular velocity)	Left (°/s)	Right (°/s)	Note
Pelvis rotation (total)	—	388.87	
Pelvis rotation, right segment	0.00*	—	not applicable to left hook drive
Pelvis rotation, left segment	453.85	—	primary rotational driver
Hip flexion/extension	71.48	104.89	
Hip abduction/adduction	44.96	39.18	
Knee flexion/extension	123.07	152.34	
Ankle flexion/extension	61.87	49.73	
Shoulder flexion/extension	23.87	497.43	right value reflects session-wide peak, not isolated to left hook
Shoulder flexion/extension (vertical ref.)	33.08	547.53	right value reflects session-wide peak, not isolated to left hook
Shoulder abduction/adduction	27.03	70.25	
Elbow flexion/extension	159.46	178.91	

** Right pelvis segment value recorded as 0.00°/s, most likely reflecting a marker-tracking or segmentation artifact for this specific channel rather than true absence of rotation; retained here for transparency rather than omitted or estimated.*

DISCUSSION

The segmental angular velocity profile observed in this case study is broadly consistent with the proximal-to-distal sequencing principle described for rotational striking and throwing skills, in which the largest, most proximal segments initiate the movement and generate the greatest angular displacement and speed, with velocity subsequently transferred — and in relative terms attenuated — through the chain toward the distal segments [3,8].

The markedly higher angular speed at the pelvis compared with all other left-side joints supports the widely held coaching view that hook punch power originates primarily from hip and trunk rotation rather than from arm musculature alone [7,8]. This is consistent with dynamometric and force-based studies showing that lower-body and trunk contribution is strongly associated with punching force output across punch types [7,8], and extends this understanding specifically to the angular velocity domain for the hook technique.

The relatively modest angular speed recorded at the left shoulder, compared with both the pelvis and the elbow, may reflect the specific joint axes captured by the system (flexion/extension and abduction/adduction) rather than the full three-dimensional rotational contribution of the shoulder girdle, since a hook involves substantial horizontal (transverse-plane) shoulder rotation that may be partially represented within the pelvis-trunk rotation metric in this analysis pipeline. This underscores the importance of interpreting single-axis joint angular velocities as components of a broader three-dimensional movement rather than in isolation [2,5].

The comparatively high angular speed at the elbow relative to the shoulder is consistent with the classic 'whip' analogy used in striking biomechanics, whereby the more distal, lower-inertia segment (forearm) can achieve higher angular velocity than the more proximal segment once linked sequentially in an open kinetic chain, provided proximal segments decelerate appropriately to transfer momentum outward [3,9].

The markedly elevated maximum angular speed recorded for the right shoulder (497.43°/s and 547.53°/s) stands in contrast to the left-side values and, per the methodological limitation noted above, most plausibly reflects a different, faster action recorded elsewhere within the 90-second capture session — such as a jab or straight right — rather than a genuine feature of the left hook technique. This illustrates a broader methodological caution relevant to session-level maximum-value reporting: without frame-accurate isolation of a single repetition, whole-session maxima risk conflating distinct techniques within a combination sequence. Future analyses in this series should prioritise repetition-level segmentation (as performed in the companion phase-comparison case study) when precise, technique-specific angular velocity values are required [4].

As a single-participant case study drawing on a single recording session, these findings are descriptive and hypothesis-generating rather than generalisable to the broader population of elite boxers. The absence of confirmed inter-segmental peak-timing data (i.e., the precise moment at which each joint's peak angular speed occurred) also means that while the sequencing principle is consistent with the observed magnitude hierarchy, direct temporal confirmation of proximal-to-distal sequencing was not possible within the scope of the present dataset [3].

Future work should extend this analysis across multiple isolated repetitions and boxers of varying weight classes and skill levels [9,10], incorporate synchronised force or impact data to relate angular velocity to actual striking force [7,8], and capture peak-timing data for each joint to directly verify the temporal sequencing of the kinetic chain during the hook punch.

CONCLUSION

This case study quantified the maximum segmental angular velocity of the pelvis, hip, knee, ankle, shoulder, and elbow during a left-hand hook punch performed by an elite professional boxer. The pelvis (left segment rotation) exhibited by far the highest angular speed among left-side segments, followed by the elbow and knee, supporting the principle that hook punch power

originates predominantly from pelvis-trunk rotation and is transmitted through the kinetic chain toward the distal arm segments. These findings reinforce coaching approaches that prioritise hip and trunk rotational speed development for hook punch technique and provide a basis for future comparative and repetition-level biomechanical research on punch typology in elite boxers.

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KINETIC CHAIN CONTRIBUTION TO MAXIMUM ANGULAR VELOCITY OF THE LEFT HOOK PUNCH IN AN ELITE PROFESSIONAL BOXER: A THREE-DIMENSIONAL KINEMATIC CASE STUDY

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Annotatsiya. *Mazkur maqolada elita professional yarim o'rtacha vazn toifasidagi boksyor tomonidan bajarilgan chap qo'l bilan hook zarba davomida tana segmentlarining maksimal burchak tezligi uch o'lchamli harakatni qayd etish (STT Systems 3DMA, 19 markerli to'plam, 240 Hz, 90 soniyalik yozuv) yordamida tahlil qilingan. Tos, chanoq-son, tizza, to'piq, yelka va tirsak bo'g'imlarining maksimal burchak tezligi ko'rsatkichlari kinetik zanjir nuqtai nazaridan taqqoslangan. Natijalar chap tomon bo'yicha eng yuqori burchak tezligi tosning chap segmentida (453,85 °/s) qayd etilganini, undan keyin tirsak (159,46 °/s) va tizza (123,07 °/s) bo'g'imlari kelishini ko'rsatdi. Bu natijalar chap hook zarbasida kuchning asosiy manbai tos-tana aylanishi ekanligini va bu energiya proksimal-distal kinetik zanjir orqali tirsakka uzatilishini tasdiqlaydi. Olingan ma'lumotlar mualliflarning ilgari o'tkazgan jab va uppercut zarbalari bo'yicha tadqiqotlari bilan uyg'un holda, texnik murabbiylik va boksyorlarda zarba tezligini optimallashtirish bo'yicha amaliy tavsiyalar uchun asos bo'lishi mumkin.*

Kalit so'zlar: *boks biomexanikasi, hook zarba, burchak tezligi, kinetik zanjir, uch o'lchamli kinematika, elita sportchi.*

Аннотация. *В статье представлен анализ максимальной угловой скорости сегментов тела при выполнении хука левой рукой элитным профессиональным боксёром полусреднего веса с использованием трёхмерного захвата движения (STT Systems 3DMA, набор из 19 маркеров, 240 Гц, запись длительностью 90 секунд). Показатели максимальной угловой скорости таза, тазобедренного, коленного, голеностопного, плечевого и локтевого суставов сопоставлены с точки зрения кинетической цепи. Результаты показали, что наивысшая угловая скорость по левой стороне тела зафиксирована в левом сегменте таза (453,85 °/с), далее следуют локтевой (159,46 °/с) и коленный (123,07 °/с) суставы. Эти данные подтверждают, что основным источником силы хука левой рукой является ротация таза и туловища, энергия которой передаётся через проксимально-дистальную кинетическую цепь к*

локтевому суставу. Результаты согласуются с более ранними исследованиями авторов по джебу и апперкоту и могут быть полезны для технической подготовки тренеров и оптимизации скорости удара у боксёров.

Ключевые слова: *биомеханика бокса, хук, угловая скорость, кинетическая цепь, трёхмерная кинематика, элитный спортсмен.*

Annotation. *This article presents an analysis of the maximum segmental angular velocity recorded during a left-hand hook punch performed by an elite professional welterweight boxer, using three-dimensional motion capture (STT Systems 3DMA, 19-marker set, 240 Hz, 90-second recording). Maximum angular speed values for the pelvis, hip, knee, ankle, shoulder, and elbow were compared from a kinetic chain perspective. The results showed that the highest angular speed on the left side of the body occurred at the left pelvis segment (453.85°/s), followed by the elbow (159.46°/s) and knee (123.07°/s) joints. These findings confirm that pelvis-trunk rotation is the principal source of power for the left hook, with energy transmitted through a proximal-to-distal kinetic chain toward the elbow. The results are consistent with the authors' previous work on the jab and uppercut and may be useful for technical coaching and for optimising punch speed in boxers.*

Keywords: *boxing biomechanics, hook punch, angular velocity, kinetic chain, three-dimensional kinematics, elite athlete.*

INTRODUCTION

Punching power in boxing is not generated by the arm in isolation but through a coordinated, sequential rotation of body segments known as the kinetic chain, in which energy generated by the larger, more proximal segments (legs, pelvis, trunk) is transferred through the trunk and shoulder girdle to the smaller, more distal segments (arm, forearm, fist). This sequential pattern, often referred to as the principle of summation of speed, allows each successive segment to begin its motion with the velocity already generated by the segment preceding it, so that the distal endpoint — the fist — reaches its highest velocity at the moment of impact. The theoretical foundations of this striking mechanism, together with the design of instrumented striking targets suitable for its study, have been described in detail by Tajibaev et al. (2024).

Angular velocity, expressed in degrees per second, is one of the primary kinematic variables used to quantify how effectively this energy transfer occurs

at each joint. Compared to joint angle alone, angular velocity captures the dynamic, time-dependent character of the movement and is therefore considered more directly related to striking power and technique efficiency. In amateur boxers, Tajibaev et al. (2026a) demonstrated that targeted biomechanics-based training can measurably increase the maximum angular velocity of the jab punch, indicating that segmental angular velocity is both a meaningful performance marker and a trainable quality rather than a fixed individual trait.

Lower-limb and ankle joint kinematics form an important, though often overlooked, part of the kinetic chain underlying punching technique. Tajibaev et al. (2026b) reported qualification-related differences in ankle kinematics during the right-hand uppercut in competitive boxers, showing that higher-qualification athletes exhibit distinct ankle angular patterns compared with lower-qualification counterparts, which suggests that the efficiency of proximal-to-distal energy transfer through the lower limb may itself be a marker of technical mastery. In a related line of work, Tajibaev et al. (2026c) showed that an eight-week biomechanics-based training intervention produced measurable kinematic adaptations in the uppercut punch of amateur boxers, further supporting the view that segment-specific kinetic chain contributions can be deliberately trained and monitored over time.

Taken together, this body of work — spanning the theoretical foundations of striking mechanics (Tajibaev et al., 2024), jab angular velocity development (Tajibaev et al., 2026a), qualification-related ankle kinematics in the uppercut (Tajibaev et al., 2026b), and training-induced kinematic adaptation in the uppercut (Tajibaev et al., 2026c) — has so far left the hook punch, and in particular its full-body angular velocity profile from pelvis to fist, comparatively unexamined. The hook involves substantial transverse-plane rotation of the pelvis and trunk combined with simultaneous flexion/extension and abduction/adduction at the shoulder and elbow, making its kinetic chain considerably more complex to characterise than that of the jab or the largely sagittal-plane uppercut.

Direct three-dimensional angular velocity profiles of the hook punch, broken down by individual joint and expressed across the full kinetic chain from pelvis to fist, remain scarce in the literature more broadly, particularly for elite professional boxers competing at world level. Characterising this profile has both theoretical and applied value: theoretically, it allows verification of the proximal-to-distal sequencing principle in a rotational, rather than purely linear, striking technique; practically, and consistent with the authors' prior findings that segmental kinematics can be deliberately trained (Tajibaev et al., 2026a, 2026c), identifying which joints contribute most to angular speed generation can inform individualised strength and conditioning programming as well as technical coaching cues aimed at improving hook punch speed.

The purpose of this study was to quantify and describe the maximum segmental angular velocity of the pelvis, hip, knee, ankle, shoulder, and elbow during a left-hand hook punch performed by an elite professional welterweight boxer, using three-dimensional motion capture, and to interpret these values in the context of proximal-to-distal kinetic chain sequencing and the authors' broader research programme on punch kinematics.

MATERIALS AND METHODS

The participant was an elite professional welterweight boxer with an Olympic and world-championship amateur background and an undefeated professional record at world-title level. [Anthropometric data, age, and training status to be inserted.] The participant provided informed consent prior to data collection, and the study procedures were approved by the relevant institutional ethics committee [approval number to be inserted].

Full-body kinematic data were captured using a three-dimensional motion analysis system (STT Systems 3DMA) with a 19-marker full-body set, sampled at 240 Hz over a continuous 90-second recording (Full-body analysis (19p) protocol; recording date 2026-07-11). The system's software automatically computed, for each tracked joint, the maximum angular speed (°/s) attained over

the recorded interval, alongside maximum/minimum joint angles and phase-specific angular values.

Because the 90-second recording captured a continuous sequence of technical actions rather than a single isolated repetition, the maximum angular speed values reported by the system for each joint represent the peak value attained at any point during the recording session, and are not guaranteed to originate from the same single left hook repetition analysed in the companion case study of this series. This is an important methodological limitation: for joints on the non-punching (right) side, in particular the shoulder (497.43°/s and 547.53°/s with vertical reference), the recorded maxima are markedly higher than would be expected from a stabilising guard-arm role during a left hook, and most plausibly reflect a faster action recorded elsewhere in the session (e.g., a jab or straight right). These right-side shoulder values are therefore reported for completeness but are not interpreted as characteristic of the left hook technique.

The software's gait/running-specific temporal and spatial output fields (cadence, flight time, step length, and related parameters) were populated using a locomotion analysis template not designed for punching actions; these fields returned non-physiological or zero values for a stationary striking task and were therefore excluded from analysis as not applicable to the present study.

Segmental angular velocities were extracted for the pelvis (rotation, left and right segments), hip (flexion/extension, abduction/adduction), knee (flexion/extension), ankle (flexion/extension), shoulder (flexion/extension, flexion/extension referenced to vertical, abduction/adduction), and elbow (flexion/extension), for both the left (punching) and right (guard) sides. Left-side values were treated as the primary variables of interest for characterising the left hook kinetic chain, consistent with the technique under study.

RESULTS

Table 1 presents the maximum angular speed recorded for each segment/joint, for the left and right sides. Figure 1 illustrates the left-side values ordered proximal to distal (pelvis → hip → knee → ankle → shoulder → elbow).

On the left (punching) side, the highest maximum angular speed by a substantial margin was recorded at the pelvis (left segment rotation), at 453.85°/s. This was followed, in descending order of magnitude, by the elbow flexion/extension (159.46°/s), knee flexion/extension (123.07°/s), hip flexion/extension (71.48°/s), ankle flexion/extension (61.87°/s), hip abduction/adduction (44.96°/s), shoulder abduction/adduction (27.03°/s), and shoulder flexion/extension referenced to vertical (33.08°/s) and to the anatomical axis (23.87°/s).

The pelvic rotation value was approximately 2.8 times greater than the next-highest left-side segmental value (elbow flexion/extension) and approximately 6.4 times greater than the lowest left-side shoulder value recorded, indicating that pelvis-trunk rotation was, by a clear margin, the dominant contributor to angular speed generation on the punching side. Notably, the left elbow attained a higher maximum angular speed than any of the left shoulder measures, suggesting that the terminal 'whip-like' extension of the forearm contributed more to distal angular speed than shoulder joint rotation itself, consistent with a rotational technique in which shoulder girdle and trunk rotation — captured primarily through the pelvis metric — drives the arm, while the elbow contributes the final acceleration of the fist.

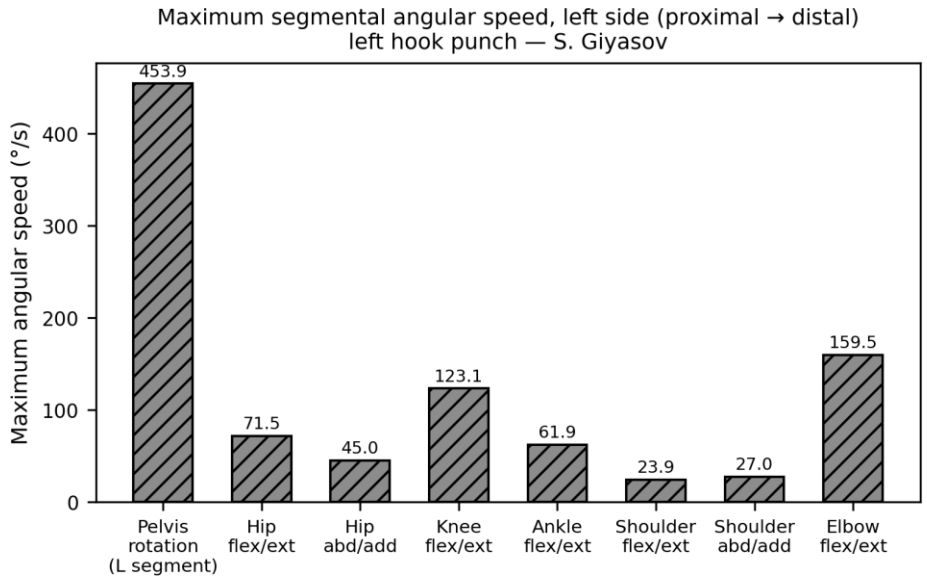

Figure 1. Maximum segmental angular speed, left side, ordered proximal to distal (pelvis → elbow), left hook punch.

Table 1

Maximum angular speed by segment/joint, left and right sides

Segment / Joint (angular velocity)	Left (°/s)	Right (°/s)	Note
Pelvis rotation (total)	—	388.87	
Pelvis rotation, right segment	0.00*	—	not applicable to left hook drive
Pelvis rotation, left segment	453.85	—	primary rotational driver
Hip flexion/extension	71.48	104.89	
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Shoulder flexion/extension (vertical ref.)	33.08	547.53	right value reflects session-wide peak, not isolated to left hook
Shoulder abduction/adduction	27.03	70.25	
Elbow flexion/extension	159.46	178.91	

** Right pelvis segment value recorded as 0.00°/s, most likely reflecting a marker-tracking or segmentation artifact for this specific channel rather than true absence of rotation; retained here for transparency rather than omitted or estimated.*

DISCUSSION

The segmental angular velocity profile observed in this case study is broadly consistent with the proximal-to-distal sequencing principle described for rotational striking and throwing skills, in which the largest, most proximal segments initiate the movement and generate the greatest angular displacement and speed, with velocity subsequently transferred — and in relative terms attenuated — through the chain toward the distal segments (Putnam, 1993; Lenetsky et al., 2013).

The markedly higher angular speed at the pelvis compared with all other left-side joints supports the widely held coaching view that hook punch power originates primarily from hip and trunk rotation rather than from arm musculature alone (Smith et al., 2000; Lenetsky et al., 2013). This is consistent with dynamometric and force-based studies showing that lower-body and trunk contribution is strongly associated with punching force output across punch types, and extends this understanding specifically to the angular velocity domain for the hook technique. It is also consistent with the authors' own finding that ankle kinematics — the most distal link of the lower-body drive — differ systematically with boxer qualification level during the uppercut (Tajibaev et al., 2026b), suggesting that efficient lower-limb-to-pelvis energy transfer may be a general marker of technical proficiency across punch types, not only the uppercut.

The relatively modest angular speed recorded at the left shoulder, compared with both the pelvis and the elbow, may reflect the specific joint axes captured by the system (flexion/extension and abduction/adduction) rather than the full three-dimensional rotational contribution of the shoulder girdle, since a hook involves substantial horizontal (transverse-plane) shoulder rotation that may be partially represented within the pelvis-trunk rotation metric in this analysis pipeline. This underscores the importance of interpreting single-axis joint angular velocities as components of a broader three-dimensional movement rather than in isolation (Piorkowski et al., 2011; Filimonov et al., 1985).

The comparatively high angular speed at the elbow relative to the shoulder is consistent with the classic 'whip' analogy used in striking biomechanics, whereby the more distal, lower-inertia segment (forearm) can achieve higher angular velocity than the more proximal segment once linked sequentially in an open kinetic chain, provided proximal segments decelerate appropriately to transfer momentum outward (Putnam, 1993; Loturco et al., 2016). This pattern parallels the authors' earlier observation that jab angular velocity could be deliberately increased through targeted biomechanics-based training (Tajibaev

et al., 2026a), reinforcing the view that distal-segment angular speed in punching is a trainable, technique-dependent quality rather than a fixed anthropometric ceiling.

The markedly elevated maximum angular speed recorded for the right shoulder (497.43°/s and 547.53°/s) stands in contrast to the left-side values and, per the methodological limitation noted above, most plausibly reflects a different, faster action recorded elsewhere within the 90-second capture session — such as a jab or straight right — rather than a genuine feature of the left hook technique. This illustrates a broader methodological caution relevant to session-level maximum-value reporting: without frame-accurate isolation of a single repetition, whole-session maxima risk conflating distinct techniques within a combination sequence. Instrumented, purpose-built striking targets of the kind described by Tajibaev et al. (2024) may help address this limitation in future data collection by enabling more precise temporal isolation of individual strikes. Future analyses in this series should prioritise repetition-level segmentation (as performed in the companion phase-comparison case study) when precise, technique-specific angular velocity values are required (Stanley et al., 2018).

As a single-participant case study drawing on a single recording session, these findings are descriptive and hypothesis-generating rather than generalisable to the broader population of elite boxers. The absence of confirmed inter-segmental peak-timing data (i.e., the precise moment at which each joint's peak angular speed occurred) also means that while the sequencing principle is consistent with the observed magnitude hierarchy, direct temporal confirmation of proximal-to-distal sequencing was not possible within the scope of the present dataset (Putnam, 1993).

Future work should extend this analysis across multiple isolated repetitions and boxers of varying weight classes and skill levels (Chaabene et al., 2015; Tajibaev et al., 2026b), incorporate synchronised force or impact data to relate angular velocity to actual striking force (Smith et al., 2000; Lenetsky et al., 2013), and — following the training-intervention model already applied by

the authors to the uppercut (Tajibaev et al., 2026c) — evaluate whether a comparable biomechanics-based intervention can measurably increase hook punch angular velocity along the kinetic chain.

CONCLUSION

This case study quantified the maximum segmental angular velocity of the pelvis, hip, knee, ankle, shoulder, and elbow during a left-hand hook punch performed by an elite professional boxer. The pelvis (left segment rotation) exhibited by far the highest angular speed among left-side segments, followed by the elbow and knee, supporting the principle that hook punch power originates predominantly from pelvis-trunk rotation and is transmitted through the kinetic chain toward the distal arm segments. Taken together with the authors' earlier findings on the jab and uppercut, these results reinforce coaching approaches that prioritise hip and trunk rotational speed development for hook punch technique and provide a basis for future comparative, repetition-level, and intervention-based biomechanical research on punch typology in elite boxers.

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REGIONAL DISPARITIES IN COACHING CAPACITY WITHIN TAEKWONDO (WT) DEVELOPMENT IN UZBEKISTAN

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O‘zbekiston Milliy Olimpiya qo‘mitasi vitse-prezidenti

***Abstract**: Coaching workforce capacity is a determinant of talent-development quality that is frequently overlooked relative to athlete-facing outcomes. This paper presents a descriptive analysis of the regional distribution of coaching capacity within the Taekwondo (WT) sport in Uzbekistan for 2022–2025, following Presidential Resolution No. PQ–337. Using official Taekwondo (WT) Association reporting, the national coaching cadre grew to 1,042 (834 in sports institutions, 208 in clubs and the specialised centre), supported by 29 local and 8 international seminars. Regional disaggregation shows the athlete-to-coach ratio varying from 18.8:1 to 56.2:1 across 14 regions (coefficient of variation 27.3%), indicating that national growth has not translated into even capacity across the country. Priority regions and structural gaps are identified for future workforce development.*

***Keywords:** coach education; workforce capacity; taekwondo; regional disparity; sports management; Uzbekistan.*

INTRODUCTION

The quality of coaching is widely regarded in the sport-coaching literature as a primary determinant of athlete development outcomes, yet coach education and continuing professional development (CPD) remain comparatively under-theorised relative to athlete-centred talent identification research (Cushion, Armour, & Jones, 2003). Coaching effectiveness itself is best understood as the coach's integrated professional, interpersonal and intrapersonal knowledge (Côté & Gilbert, 2009). A separate but related body of research shows that geographic location is itself an independent determinant of organised sport access: rural and under-resourced areas consistently show lower participation and weaker infrastructure than urban centres, independent of talent supply (Kellstedt, Spengler, Foster, Lee, & Maddock, 2021; Kanters, Bocarro, Filardo, Edwards,

McKenzie, & Floyd, 2020). At the organisational level, a national federation's capacity to deliver workforce development is itself shaped by governmental support and institutional structure (Amis, Slack, & Hinings, 2004; Green & Houlihan, 2006).

In Uzbekistan, the taekwondo (WT) governing body has reported a substantial expansion of coaching capacity since Presidential Resolution No. PQ–337 (29 July 2022), including local and international seminar programmes. This paper analyses that reported capacity-building activity for 2022–2025, disaggregating the coaching workforce by region to test whether national growth has been evenly distributed, and situates the findings within the international coach-education literature.

MATERIALS AND METHODS

This is a descriptive, retrospective analysis of secondary administrative data from an official Taekwondo (WT) Association of Uzbekistan report (23 December 2025, covering 2022 to 1 January 2026) and its regional appendix, which lists coach and athlete counts by region and training format (sports institution, club, private sector, specialised centre). Regional coaching capacity was expressed as the athlete-to-coach ratio per region; dispersion was summarised with the population standard deviation and coefficient of variation (CV = SD / mean × 100). No independent verification of reported figures was possible, and no inferential statistical testing was performed given the small number of administrative units (14 regions).

RESULTS

Between 2022 and 1 January 2026, the national coaching cadre grew to 1,042 coaches, of whom 834 (80.0%) work within sports institutions and 208 (20.0%) within clubs and the specialised Taekwondo Centre. This growth was supported by 29 local and 8 international coach-education seminars over the same period.

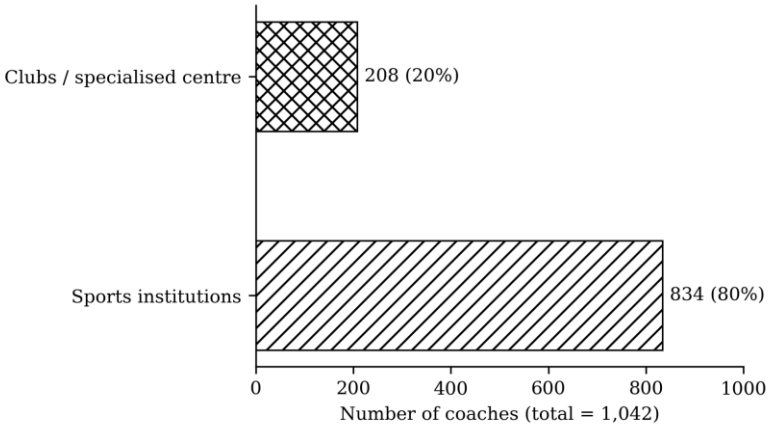

Figure 1. Composition of the national coaching cadre by institutional setting (total = 1,042).

Disaggregating this national total by region shows that growth has not been evenly distributed (Table 1). The athlete-to-coach ratio ranges from 18.8:1 in Jizzakh region — where a specialised centre concentrates additional coaching staff — to 56.2:1 in Namangan region, a threefold difference. Across all 14 regions the mean ratio is 33.0 athletes per coach, with a population standard deviation of 9.0 and a coefficient of variation of 27.3%, concealing substantial disparity behind the national aggregate ratio of 31.1. Kashkadarya (44.5:1), Namangan (56.2:1) and Tashkent region (37.7:1) carry the highest coach caseloads, more than 1.3 times the national mean.

Region	Athletes	Coaches	Athletes / coach
Karakalpakstan	1,470	53	27.7
Andijan	2,568	78	32.9
Bukhara	2,480	84	29.5
Jizzakh	2,185	116	18.8
Kashkadarya	1,468	33	44.5
Navoiy	1,240	33	37.6
Namangan	2,698	48	56.2

Samarkand	2,322	75	31.0
Surkhandarya	1,958	54	36.3
Syrdarya	1,202	53	22.7
Tashkent region	3,770	100	37.7
Fergana	3,979	126	31.6
Khorezm	924	31	29.8
Tashkent city	4,116	158	26.1
National total	**32,398**	**1,042**	**31.1**

Table 1. Regional coaching workforce and athlete-to-coach ratio (source: Appendix 1 of the Taekwondo (WT) Association report, 23 December 2025).

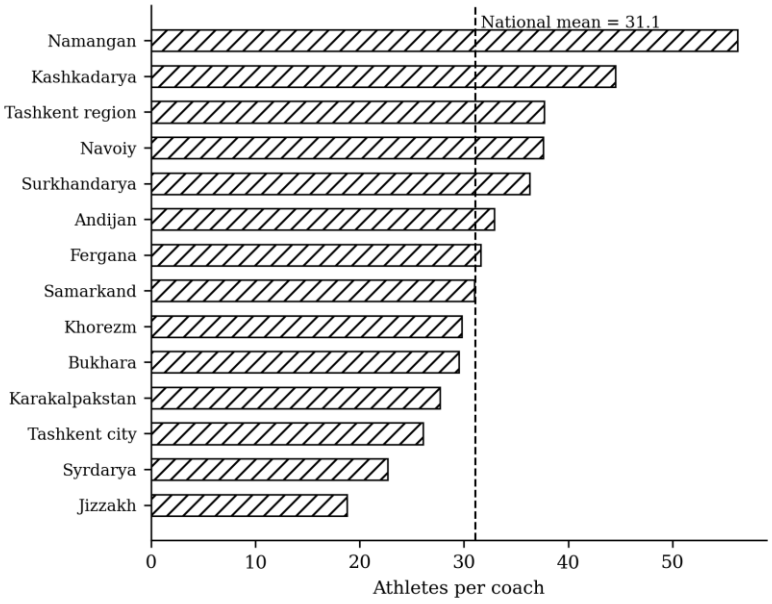

Figure 2. Athlete-to-coach ratio by region, ranked ascending, with national mean (dashed line).

DISCUSSION

The reported data show substantial absolute growth in coaching capacity, consistent with the stated aims of Resolution PQ–337, but the regional disaggregation reveals that this growth has not been evenly distributed. A CV of

27.3% in the athlete-to-coach ratio places some regions at more than 1.3 times the national mean caseload. This pattern echoes a recurring theme in the international coach-education literature, where CPD provision is often delivered inconsistently across contexts despite formally centralised programme design (Cushion et al., 2003), and mirrors findings from geographically disaggregated youth-sport research showing that organised sport access varies significantly even within a single governing jurisdiction (Kellstedt et al., 2021; Kanters et al., 2020). The absence, in the reported data, of a documented competency framework for coach certification is a further point the international literature would flag: contemporary research increasingly emphasises structured, criterion-referenced progression pathways over seminar attendance alone (Côté & Gilbert, 2009; Cushion et al., 2003). At the organisational level, the federation's capacity to close the identified regional gaps will depend as much on institutional and governmental support structures as on seminar counts alone (Amis et al., 2004; Green & Houlihan, 2006).

CONCLUSION

Between 2022 and 2025, Uzbekistan's taekwondo (WT) coaching cadre grew to 1,042, but regional disaggregation identifies a 27.3% coefficient of variation in coaching capacity, with Namangan, Kashkadarya and Tashkent region carrying the highest athlete caseloads per coach. It is recommended that coach recruitment and seminar allocation be prioritised toward these three regions, that a standardised, competency-based certification framework be developed to complement the existing seminar-attendance model, and that the specialised-centre model applied in Jizzakh region be evaluated for replication in the highest-caseload regions.

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REFEREEING CERTIFICATION PATHWAY AND INTERNATIONAL INTEGRATION IN UZBEKISTAN'S TAEKWONDO (WT) SYSTEM

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***Abstract**: Sport officiating research has only recently been consolidated into a coordinated agenda covering the training, development and retention of referees and judges. This paper examines the certification pathway and international integration of the refereeing system within Taekwondo (WT) in Uzbekistan for 2022–2025. The certified refereeing cadre reached 183 officials (163 local-category, 20 international-category), developed through 38 local and 10 international seminars - proportionally more intensive than the coaching cadre's seminar schedule. Two national representatives were elected to Asian Taekwondo Union governance structures, and a memorandum of cooperation was signed to align qualification standards with international practice. Structural gaps, including the absence of a standardised competency framework, are identified for future development.*

***Keywords:**sports officiating; referee certification; taekwondo; continuing professional development; international integration; Uzbekistan.*

INTRODUCTION

Sport officiating research has only recently been consolidated into a coordinated research agenda covering the training, development and retention of referees and judges (an expert statement on the future of sport officiating research, 2025). Coaching effectiveness itself is best understood as integrated professional, interpersonal and intrapersonal knowledge (Côté & Gilbert, 2009), and continuing professional development requires coherence rather than one-off seminar delivery (Cushion, Armour, & Jones, 2003) - principles that extend directly to officiating development. In combat sports specifically, coaches and officials themselves rank technical-preparation activities well above administrative and officiating-adjacent duties in importance (Sterkowicz-Przybyćień et al., martial-arts coach professional-activities survey), suggesting

that formal certification structures play a particularly important role in sustaining refereeing standards.

In Uzbekistan, the taekwondo (WT) governing body has reported a substantial expansion of refereeing capacity since Presidential Resolution No. PQ–337 (29 July 2022), including an examination-based certification pathway and formal integration into Asian Taekwondo Union governance structures. This paper analyses that reported activity for 2022–2025 and situates the findings within the international sport-officiating and coach-education literature.

MATERIALS AND METHODS

This is a descriptive, retrospective analysis of secondary administrative data from an official Taekwondo (WT) Association of Uzbekistan report (23 December 2025, covering 2022 to 1 January 2026). Refereeing cadre size, seminar counts (local and international) and certification-category composition were extracted as reported, alongside narrative reporting on international governance integration. No independent verification of reported figures or of seminar content/examination rigor was possible.

RESULTS

Between 2022 and 1 January 2026, the certified refereeing cadre reached 183 officials: 163 (89.1%) at local category and 20 (10.9%) at international category, developed through 38 local and 10 international seminars.

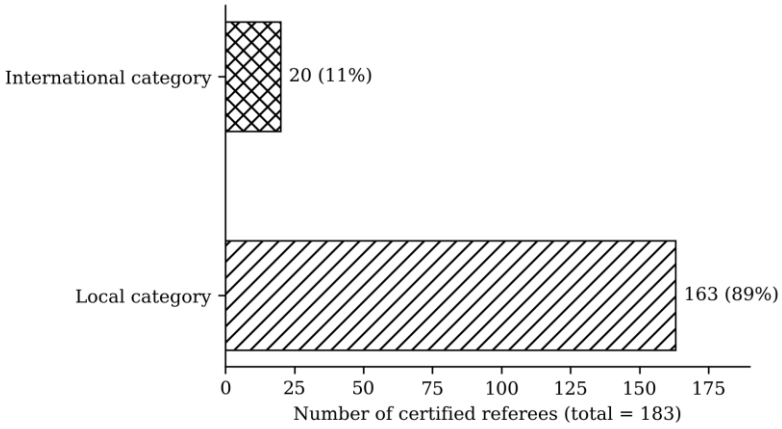

Figure 1. Composition of the certified refereeing cadre by category (total = 183).

Referees received a higher absolute number of both local (38 vs. 29) and international (10 vs. 8) seminars than coaches over the same period, despite the certified referee cadre (183) being substantially smaller than the coaching cadre (1,042) — indicating a proportionally more intensive continuing-education schedule per official for referees than for coaches.

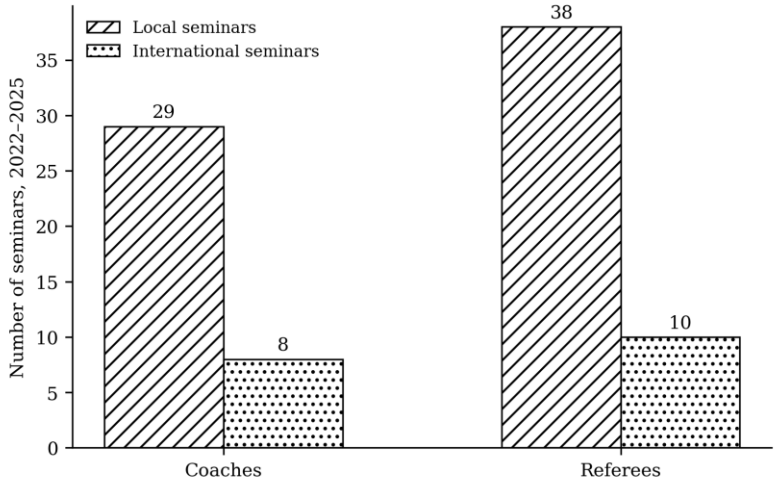

Figure 2. Number of local and international capacity-building seminars for coaches and referees, 2022–2025.

The examination cycle for certification renewal differs sharply by category: local-category referee examinations are held three times per year, while international-category examinations are held once every three years — a considerably lower renewal frequency for the smaller, more senior tier of officials. Alongside domestic certification, two Uzbekistan representatives were elected to Asian Taekwondo Union governance structures during the reporting period: one as deputy chair of the Referees Committee and one as a member of the Competition Organising Committee. A memorandum of cooperation was subsequently signed with the Asian Taekwondo Union's new leadership, covering the alignment of regional coach and referee qualification with international standards and the involvement of foreign specialists. The planned Uzbekistan Taekwondo Academy (Chirchiq, Tashkent region, operational from 2026) is designed to formalise this qualification pathway further, hosting black-

belt examinations and the local- and international-category referee examination cycles within a single institutional structure.

DISCUSSION

The referee-certification asymmetry — a three-times-per-year local exam cycle against a once-per-three-years international exam cycle — is consistent with international officiating-development pathways more generally, where progression to higher certification tiers is deliberately less frequent and more selective (sport officiating research agenda, 2025), though the reported data do not indicate whether the interval reflects a deliberate quality-control design choice or a resource constraint. The absence of a documented competency framework or standardised assessment rubric for referee certification is a point the international literature would flag: contemporary coach-education research increasingly emphasises structured, criterion-referenced progression pathways over seminar attendance alone (Côté & Gilbert, 2009; Cushion et al., 2003), and combat-sport-specific survey evidence suggests officials themselves may deprioritise the administrative activities such a framework would need to formalise (Sterkowicz-Przybyćień et al., martial-arts coach professional-activities survey). The election of Uzbekistan representatives to Asian Taekwondo Union governance structures and the subsequent memorandum of cooperation represent a substantive institutional channel for importing international certification standards, consistent with research showing that a federation's capacity to develop its workforce is shaped by its broader governmental and institutional relationships.

CONCLUSION

Between 2022 and 2025, Uzbekistan's certified refereeing cadre grew to 183, supported by a proportionally intensive seminar programme and by formal integration into Asian Taekwondo Union governance. It is recommended that the planned Uzbekistan Taekwondo Academy be used to establish a standardised, competency-based certification framework and longitudinal tracking of individual referee cohorts from certification through to competition-

assignment outcomes, enabling future research to link officiating capacity indicators directly to competition quality.

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OROL DENGIZI INQIROZINING MARKAZIY OSIYO BIOXILMA-XILLIGIGA TA'SIRI VA EKOTIZMLARNING TRANSFORMATSIYASI

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Annotatasiya: *Ushbu maqolada Orol dengizining qurishi natijasida yuzaga kelgan ekologik inqirozning Markaziy Osiyo mintaqasi biologik xilma-xilligiga ta'siri va bu jarayon ta'sirida shakllangan yangi ekotizimlarning transformatsiya xususiyatlari tahlil qilinadi. XX asrning 60-yillaridan boshlangan gidrologik o'zgarishlar suv sho'rligini bir necha o'n baravar oshirib, ikki tomonlama oqibatga olib keldi: bir tomondan, dengiz faunasi va florasining keskin qashshoqlashuviga, ikkinchi tomondan, quruq tubida (Orolqumda) yangi, sho'rga chidamli cho'l ekotizimining shakllanishiga sabab bo'ldi. Shimoliy Orolda Qo'qorol to'g'oni qurilishidan so'ng biologik ko'rsatkichlarning qisman tiklanishi kuzatilmoqda, biroq Janubiy Orol hududida degradatsiya jarayoni davom etmoqda. Shuningdek Orol dengizida shakllangan biologik xilma-xillikni saqlash va Orolbo'yi ekotizimlarini barqarorlashtirish bo'yicha tavsiyalar keltirilgan.*

Kalit so'zlar: *Orol dengizi, biologik xilma-xillik, ekotizim transformatsiyasi, Orolqum, sho'rlanish, saksovulzorlashtirish, Markaziy Osiyo ekologiyasi.*

Abstract: *This article analyzes the impact of the ecological crisis caused by the desiccation of the Aral Sea on the biodiversity of the Central Asian region and examines the transformation characteristics of the new ecosystems formed as a result of this process. Hydrological changes that began in the 1960s increased water salinity by several dozen times, leading to two major consequences: on the one hand, a sharp decline in the flora and fauna of the Aral Sea, and on the other hand, the formation of a new salt-tolerant desert ecosystem (the Aralkum Desert) on the exposed seabed. Following the construction of the Kokaral Dam, partial recovery of biological indicators has been observed in the Northern Aral Sea; however, ecosystem degradation continues in the Southern Aral region. The article also provides recommendations for conserving the biodiversity of the Aral Sea and stabilizing the ecosystems of the Aral Sea region.*

Keywords: *Aral Sea, biodiversity, ecosystem transformation, Aralkum Desert, salinization, saxaul afforestation, Central Asian ecology.*

KIRISH

Orol dengizi o'tgan asrning 60-yillarigacha dunyodagi to'rtinchi yirik ichki suv havzasi hisoblanib, Markaziy Osiyo iqlimini muvozanatlashtiruvchi, boy flora va faunaga ega noyob ekotizim sifatida mintaqa xalqlari hayotida muhim o'rin tutgan[1]. Sovet davrida paxta yakkahokimligini kengaytirish maqsadida Amudaryo va Sirdaryo suvlarining sug'orishga keng miqyosda yo'naltirilishi dengizga oqib keluvchi suv hajmining keskin kamayishiga olib keldi. Natijada suv sathi tushib, sho'rlanish darajasi bir necha o'n barobar oshdi, bu esa dengiz biotasining tarkibiy jihatdan tubdan o'zgarishiga sabab bo'ldi. Muammoning dolzarbligi shundaki, Orol inqirozi nafaqat mahalliy, balki butun Markaziy Osiyo mintaqasi miqyosidagi ekologik, iqtisodiy va ijtimoiy oqibatlarga ega bo'ldi: dengiz o'rnida shakllangan Orolqum cho'li chang-tuz bo'ronlarining manbaiga aylandi, baliqchilik sanoati tanazzulga yuz tutdi, mintaqa iqlimi kontinentallashdi[2]. Shu bilan birga, Orolqum cho’lining tubida yangi, o'ziga xos halofit ekotizimlarning shakllanishi tabiatning moslashuvchanlik qobiliyatini namoyon etuvchi noyob ilmiy hodisa sifatida e'tiborni tortadi.

ASOSIY QISM

Orol dengizining qurishi natijasida hosil bo'lgan Orolqum cho'li bugungi kunda millionlab gektar maydonni egallaydi. Quruq tubdan har yili millionlab tonna tuz va chang atmosferaga ko'tarilib, yuzlab kilometr masofalarga tarqalmoqda. Tuz va chang bo'ronlari tuproq unumdorligini pasaytirib, tabiiy o'simlik qoplamasining yemirilishiga hamda ko'plab o'simlik va hayvon turlarining yashash muhitini buzilishiga sabab bo'lmoqda[3]. Orol dengizi inqirozi yirik irrigatsiya loyihalari natijasida mintaqaning ikki asosiy daryosi – Amudaryo va Sirdaryodan qishloq xo‘jaligi maqsadlarida suv o‘tkazilgach boshlandi. Bu burilish dengizga suv oqimini keskin kamaytirib, uning asta-sekin qisqarishiga olib keldi. Suv sathi keskin pasayganda, dengiz sezilarli darajada kichikroq ko'llarga bo'linib, mintaqa landshaftini tezda o'zgartirdi. Suv sathining qisqarishi: Suv oqimining qisqarishi Orol dengizining 1960-yillardan buyon

taxminan 90% hajmini yo'qotishiga olib keldi va bu uning ekotizimiga va suv hayotiga salbiy ta'sir ko'rsatdi.

Sho'rlanish: Borgan sari konsentratsiyalangan suv juda sho'rlangan bo'lib, uni ko'pchilik organizmlar uchun yaroqsiz holga keltirdi. Tuz miqdorining ko'payishi atrofdagi hududlarda tuproq sifatini yanada yomonlashtirdi.

O‘simlik va hayvonot dunyosining nobud bo‘lishi: dengiz suvining yo‘qolishi mintaqada bir paytlar o‘sgan turli o‘simlik va hayvon turlarining yo‘q bo‘lib ketishiga olib keldi.

Chang bo'ronlari va sog'liq uchun xavflar: Qishloq xo'jaligi kimyoviy moddalari va tuzga boy dengiz tubi kuchli chang bo'ronlarini keltirib chiqardi, bu esa mahalliy aholi orasida nafas olish va boshqa sog'liq muammolarini keltirib chiqardi[4]. Dastlabki ma’lumotlarga qaraganda yiliga atmosferaga 100-150 mln. tonnagacha chang-tuzon ko’tarilishi mumkin. Dengiz tubidan ko’tarilgan chang-tuz to’zoni atmosfera ifloslanishi 5 % ham ortib ketmoqda. Chang-tuzonlarning atmosferaga ko’tarilishi 1-marta 1875-yili kosmosdan kuzatilgan. Chang-tuzon uzunligi -400 km, eni esa 40 km bo‘lib, radiusi 300 km tashkil etadi. Tuzlarning yer yuzasiga yog’ilishi natijasida paxtaning hosildorligi 5-15% sholining esa 3-6 % pasayib ketdi[5].

Orol dengizi inqirozi nafaqat tabiiy muhit va bioxilma-xillikka, balki Orolbo‘yi hududida yashovchi aholi salomatligiga ham jiddiy salbiy ta'sir ko'rsatmoqda. Dengiz tubidan ko'tarilayotgan tuz va chang zarrachalari, ichimlik suvi sifatining yomonlashuvi hamda ekologik muhitning buzilishi natijasida aholi, ayniqsa bolalar va homilador ayollar orasida turli kasalliklar, jumladan kamqonlik, nafas yo'llari, ovqat hazm qilish va jigar kasalliklari ko'paymoqda. Ushbu holat hududning eng dolzarb ekologik va ijtimoiy muammolaridan biri hisoblanadi. Orol bo‘yi zonasida keyingi 15 yil ichida ich terma kasaligi bilan kasalanish 29 martaga, gepatit (jigar kasaligi) ko‘paydi. Yosh bolali ayollarning 70 %i anemiya (kam qonlik) kasaligi.Ayniqsa yosh 64 bolalar o‘limi juda ko‘p har 1000 ta tug‘ilgan boladan 100 tasi nobut bo’lmoqda. Qoraqalpog‘istonning

Bog‘ot rayonida yosh bolalar o‘limi har 1000 kishiga hisoblaganda 110 tadan ham oshib ketdi[6].

XULOSA

Xulosa qilib aytganda, Orol dengizi inqirozi Markaziy Osiyoning ekologik barqarorligi va bioxilma-xilligiga chuqur salbiy ta'sir ko'rsatdi. Dengizning qurishi natijasida tabiiy ekotizimlar keskin o'zgarib, ko'plab o'simlik va hayvon turlarining yashash muhiti qisqardi, ayrim turlar esa yo'qolish xavfi ostida qoldi. Tuproqning sho'rlanishi, cho'llanish jarayonining kuchayishi hamda tuz-chang bo'ronlarining ko'payishi hududning ekologik holatini yanada murakkablashtirdi. Bu jarayonlar nafaqat biologik xilma-xillikning kamayishiga, balki qishloq xo'jaligi, suv resurslari va aholi salomatligiga ham salbiy ta'sir ko'rsatdi.

So'nggi yillarda Orolbo'yi hududida saksovulzorlarni kengaytirish, qurigan dengiz tubini ko'kalamzorlashtirish, suv resurslarini oqilona boshqarish va xalqaro ekologik loyihalarni amalga oshirish orqali ekotizimlarni tiklash bo'yicha muhim ishlar olib borilmoqda. Ushbu chora-tadbirlar ekologik vaziyatni qisman yaxshilashga xizmat qilayotgan bo'lsa-da, muammoni to'liq bartaraf etish uchun Markaziy Osiyo davlatlari o'rtasida hamkorlikni kuchaytirish, ilmiy tadqiqotlarga asoslangan boshqaruvni rivojlantirish hamda bioxilma-xillikni muhofaza qilishga qaratilgan uzoq muddatli strategiyalarni izchil amalga oshirish zarur. Faqat kompleks ekologik yondashuv va mintaqaviy hamkorlik orqaligina Orolbo'yi ekotizimlarini tiklash hamda kelajak avlodlar uchun tabiiy resurslarni asrab qolish mumkin.

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LENTINUS TIGRENUS MAKROZAMBURUG'IDAN DONLI URUG'LIK TAYYORLASH

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Annotatsiya: *Ushbu tadqiqotda Lentinus tigrinus makrozamburug'ining donli urug'ligini tayyorlashda bug'doy va makkajo'xori donlarining samaradorligi aniqlandi. Tajribada bug'doy va makkajo'xori donlariga Lentinus tigrinus ning ikkita shtammi mitseliysi inokulyatsiya qilinib, mitseliyning o'sish tezligi, donni qoplash darajasi va zichligi kuzatildi. Tadqiqot natijalariga ko'ra, makkajo'xori donida mitseliy tezroq rivojlandi, don yuzasini to'liq va zich oq rangli qatlam bilan qopladi.*

Kalit so'zlar*: Lentinus tigrinus, donli urug'lik, inokulyatsiya, mitseliy, makrozamburug', substrat.*

Abstract: *This study investigated the effectiveness of wheat and maize grains in the preparation of grain spawn of the macrofungus Lentinus tigrinus. In the experiment, two strains of Lentinus tigrinus mycelium were inoculated onto wheat and maize grains, and the mycelial growth rate, grain colonization level, and density were evaluated. According to the results, mycelium developed faster on maize grains and completely covered the grain surface with a dense white layer.* ***Keywords:*** *Lentinus tigrinus, grain spawn, inoculation, mycelium, macrofungus, substrat.*

KIRISH

Makrozamburug‘lar vitaminlar, mineral moddalar va boshqa biologik faol birikmalarga boy bo‘lib, o‘ziga xos ta’mi va yuqori oziqaviy qiymati tufayli keng iste’mol qilinadi. Lentinus turkumi Basidiomycota bo‘limi va Polyporaceae oilasiga mansub bo‘lib, bu zamburug‘lar odatda may–oktyabr oylarida uchraydi hamda mo‘tadil, subtropik va tropik iqlim mintaqalarida keng tarqalgan [3]**.** Makrozamburug'larni sanoat miqyosida ko'paytirishda sifatli donli urug'lik (grain spawn) tayyorlash asosiy bosqichlardan biri hisoblanadi. Donli urug'lik mitseliyning substratda tez va bir tekis tarqalishini ta'minlaydi hamda

hosildorlikka bevosita ta'sir ko'rsatadi [4]. Urug'lik tayyorlashda ko'pincha bug'doy, javdar, tariq, arpa va makkajo'xori donlaridan foydalaniladi [9]. Royse (2014) ma'lumotlariga ko'ra, donli urug'likning sifati mitseliyning o'sish tezligi, ifloslanish darajasi va keyingi hosildorlikka sezilarli ta'sir qiladi [8]. Niazi va Ghafoor (2022) tomonidan *L. tigrinus* uchun donli urug‘lik guruch, jo‘xori va arpa donlarida PDA oziqa muhitida o‘stirilgan sof mitseliy yordamida tayyorlangan [7]. Kalaw va hamkorlari (2021) tomonidan olib borilgan tadqiqotda *L. tigrinus* ning turli shtammlari uchun donli urug‘lik tayyorlashda po‘stlog‘i ajratilmagan guruchdan foydalanilgan [6]. Dulay va boshq. (2021) tadqiqotida Lentinus swartzii mitseliysidan urug’lik tayyorlashda guruch, maydalangan makkajo‘xori va jo‘xori donlari urug‘lik materiali sifatida sinovdan o‘tkazilib, mitseliyning o‘sish tezligi va zichligi aniqlangan [5].

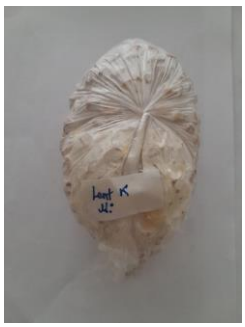
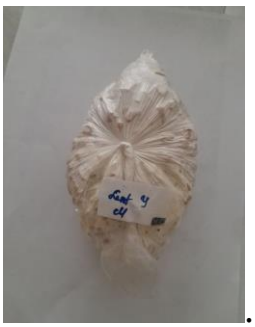
Ushbu tadqiqotda ilk marta O’zbekiston sharoitida uchrovchi *L. tigrinus* uchun donli urug‘lik tayyorlashda makkajo'xori va bug'doy donidan foydalanildi. Sifatli donli urug'lik keyinchalik meva tana yetishtirishda yuqori biologik samaradorlikni ta'minlaydi hamda laboratoriyadan ishlab chiqarish bosqichiga o'tishda muhim ahamiyat kasb etadi.

ASOSIY QISM

L.tigrinus ning meva tanalari ining ichki to‘qimasidan toza kulturasi ajratib olindi. Olingan toza kulturalar oldindan optimallashtirilgan PDA (Potato Dextrose Agar) oziqa muhitida 25±1°C da 7 kun davomida inkubatsiya qilindi. [2],[3]. Donli urug‘lik tayyorlash jarayoni Niazi va Ghafoor (2022) metodikasi asosida amalga oshirildi. Urug‘lik substrati sifatida donli ekinlardan makkajo‘xori va bug’doy donlaridan foydalanildi. Donlar avval yaxshilab yuvilib, bir kecha davomida suvda ivitildi, so‘ng 30 daqiqa davomida qaynatildi. Qaynatilgandan keyin ortiqcha namlik filtr qog‘ozi yordamida chiqarildi va donlarning namlik miqdori 65% darajada saqlandi. Tayyorlangan 500 g qaynatilgan don 1 litr hajmli shisha bonkalarga joylashtirilib, ularga 2 g gips va 1 g ohak qo‘shildi. Shundan so‘ng donli substratlar avtoklav yordamida sterilizatsiya qilindi. Sterillangan donlarga muhitida o‘stirilgan sof kulturadan

olingan mitseliy disklari yordamida laminar boksda steril sharoitda inokulyatsiya qilindi. Inokulyatsiyadan so‘ng donlar 30°C haroratda inkubatsiya qilindi. Donlarning urug‘lik materiali sifatidagi samaradorligi uch takroriy tajriba asosida baholandi [7]. Tajriba davomida *L.tigrinus* ning har ikkala Lent K va Lent Y shtammlari inkubatsiya davrida makkajo’xori va bug’doy donida oq rangli mitseliy qoplami shakllandi, biroq mitseliyning o‘sish tezligi va zichligi substrat turiga qarab farq qildi. (1-rasm) Makkajo‘xori donida mitseliy rivojlanishi tezroq kechdi va don yuzasi qisqa muddat ichida zich oq rangli mitseliy qatlami bilan qoplandi. Lent K shtammda makkajo’xori donida mitseliy hosil bo’lishi Lent Y shtammga qaraganda tezroq kuzatildi. Makkajo‘xori donlarida mitseliyning to‘liq kolonizatsiyasi Lent K shtammda 13- 14 kun bo’lsa, Lent Y shtammda 14–16 kun davomida kuzatildi. Mitseliy zichligi yuqori bo‘lib, donlar bir-biri bilan yaxshi bog‘langan holatga keldi.

Bug‘doy donida esa mitseliy o‘sishi nisbatan sekinroq bo‘lib, donlarning to‘liq qoplanishi 18–21 kun davom etdi. Bug‘doy substratida mitseliy rivojlangan bo‘lsada, uning zichligi va tarqalish tezligi makkajo‘xori doniga nisbatan pastroq ekanligi aniqlandi. Olingan natijalar shuni ko‘rsatdiki, don tarkibidagi oziq moddalar miqdori, don tuzilishi va namlikni saqlash xususiyatlari mitseliyning rivojlanishiga sezilarli ta’sir ko‘rsatadi. Makkajo‘xori doni *L.tigrinus* uchun tez kolonizatsiyalanadigan va zich mitseliy hosil qiluvchi samarali substrat sifatida baholandi. Tayyorlangan donli urug‘lik keyingi bosqichlarda meva tana hosil qilish jarayonlari uchun sifatli inokulyant sifatida foydalanish imkonini beradi.

A  B  C  D .

1-rasm.

L.tigrinus makrozamburug‘i donli urug’liklari: A- Lent K shtamm bug’doy doni asosidagi urug’lik, B- Lent K shtamm makkajo’xori doni asosidagi urug’lik, C- Lent Yshtamm bug’doy doni asosidagi urug’lik, B- Lent Y shtamm makkajo’xori doni asosidagi urug’lik.

XULOSA

Ushbu tadqiqotda *L.tigrinus* makrozamburug‘i uchun donli urug‘lik tayyorlashda bug‘doy va makkajo‘xori donlarining samaradorligi o‘rganildi. Tajriba natijalari makkajo‘xori donida mitseliyning o‘sish tezligi, zichligi va donni qoplash darajasi bug‘doy doniga nisbatan yuqori ekanligini ko‘rsatdi. Makkajo‘xori donida tayyorlangan urug‘lik 14–16 kun ichida to‘liq kolonizatsiyalanib, zich va faol mitseliy qatlami hosil qildi. Bug‘doy donida esa bu jarayon nisbatan uzoqroq davom etdi (18–21 kun). Tadqiqot natijalariga ko’ra makkajo‘xori doni *L.tigrinus* uchun sifatli donli urug‘lik olishda istiqbolli va samarali substrat sifatida tavsiya etilishi mumkin.

Mazkur natijalar *L.tigrinus* ni laboratoriya va ishlab chiqarish sharoitida ko‘paytirish texnologiyasini takomillashtirish, mahalliy xomashyolardan foydalanish hamda qo‘ziqorin yetishtirish samaradorligini oshirishda amaliy ahamiyatga ega.

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STUDY OF THE CHEMICAL COMPOSITION OF AZKAMAR DEPOSIT BENTONITE

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Abstract: *In this scientific article, experiments were conducted to determine the physicochemical properties, chemical-mineralogical composition, and structure of bentonite clay from the Azkamar deposit, obtain bentonite samples, and determine their physicochemical composition and adsorption properties. In order to expand the areas of application of bentonite clays as commercial raw materials, it is proposed to develop and apply effective methods for their enrichment with additives.*

Keywords: *chemical composition, hydroxyl, crystal, structure powder, dispersion, silicon oxides, aluminum, iron, alkaline-earth, carbonate.*

INTRODUCTION

To date, scientists are paying attention to the study and application of bentonite clay for water purification due to its ecological purity, low cost, and ease of use as a good adsorbent for water purification [1, 2].

The peculiarity of the chemical-mineralogical composition and structure of bentonite, as a natural aluminosilicate, opens the possibility of its use as a primary raw material for obtaining new sorbent materials with specified properties. [3].

The peculiarity of the chemical-mineralogical composition and structure of bentonite, as a natural aluminosilicate, opens the possibility of its use as a primary raw material for obtaining new sorbent materials with specified properties. For example, using modern chemical activation methods, new organomineral compositions can be obtained. [4-7]

Practical results on the activation of clay minerals have been achieved for several years. Using acids (15% aqueous sulfuric acid solution) and microwave

radiation, local adsorbents (montmorillonite, kaolin) were activated, and effective adsorbent compositions for vegetable oil purification were created using them. The adsorption properties and physicochemical properties of the obtained adsorbents have been investigated [8-11].

When using clay minerals as adsorbents, the amount of montmorillonite and vermiculite in their composition is of great importance. In recent years, scientific research has been conducted in the literature on the modification of montmorillonite and vermiculite and the study of their adsorption properties. Currently, our scientists [12-15] are achieving scientific and practical results in obtaining adsorbents based on local raw materials and applying them for industrial and environmental purposes.

The purpose of this work. To study the chemical and mineralogical composition of bentonite clay from the Azkamar deposit in the Navoi region, to determine the quality of the studied bentonite clay, and to explore the possibilities of its use.

Research objects and methods. The object of the research is bentonites of the Azkamar deposit. The study of the mineralogical and adsorption properties of bentonite clay, which is a natural raw material, was carried out using physicochemical and chemical analysis methods. The chemical composition of the bentonite was analyzed using a scanning electron microscope (SEM).

Results and discussion. According to the research results, the bentonite clay of the Azkamar deposit has an oily, shiny, and waxy appearance, with an aqueous solution pH of 7-8. Sampling of the deposit's bentonite clays was carried out on an area of approximately 8,000 m2. For the purpose of studying the research under laboratory conditions, about 100 kg of bentonite clay samples were taken from various layers in this deposit area, representing the average composition of the deposit.

In laboratory conditions, bentonite clay was ground in a mortar and ground into a powder in a "VIBROTEXNIK ID-65" laboratory mill. Then it was passed

through a 60-65 μm sieve. Subsequently, the sifted bentonite samples were placed in special storage containers.

In our previous studies, the results of the chemical composition of bentonite from 4 deposits, including the Azkamar deposit, were presented. Bentonite clay samples were taken from a depth of 80–100 cm, which is the primary source for obtaining bentonite clay samples; therefore, differences in mineralogical composition are possible. Bentonite clay components—silicon, aluminum, and iron oxides—as a percentage of the total mass: 56.15–68.87; 14.15-16.89 and 2.24-2.21. Bentonite clay differs not only in its elemental composition but also in the amount of its compounds.

The bentonite of the Azkamar deposit is characterized by the presence of TiO_2, MgO, Na_2O, K_2O, and other oxides. The greatest difference in mineralogical composition is observed in sorption properties, where AI_2O_3, silicon (IV) oxide, and magnesium oxide are found in small quantities in the carbonate composition, while calcium oxide is found in relatively large quantities. The chemical composition of bentonite clay from the Azkamar deposit is presented in Table 1.

Table 1

Chemical composition of bentonite samples from the Azkamar deposit

Mineralogical composition of the sample	SiO_2	TiO_2	AI_2O3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	P_2O_5	SO_3
Bentonite sample from the Azkamar deposit	56,15	0,65	14,15	9,05	2,24	0,32	2,21	1,55	0,12	0,11

The results of the electron microscopic analysis of the Azkamar deposit bentonite are presented (Fig. 1).

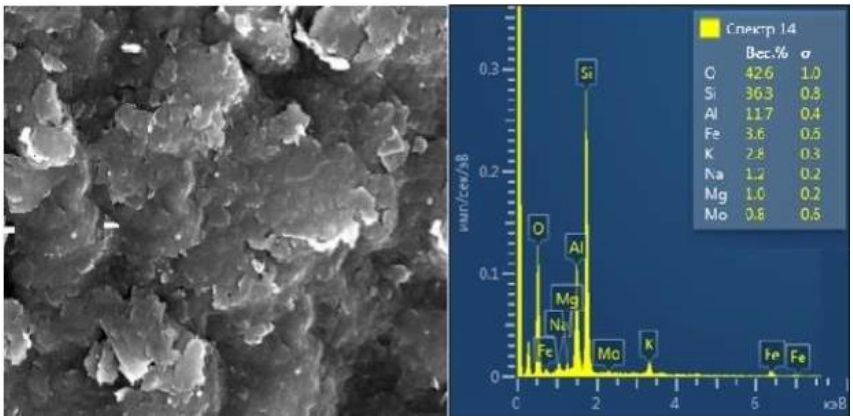

Figure 1. SEM image of Azkamar deposit bentonite

The scanning electron microscopy (SEM) image of the Azkamar deposit bentonite clearly shows its layered and flocculant structure, characteristic of its natural aluminosilicate nature. The EDS (energy-dispersion spectrometry) analysis shown on the right side of the image shows the elemental composition of bentonite. The analysis results show that bentonite is primarily rich in oxygen (42.6%) and silicon (36.3%), confirming that its primary structure consists of a silicon-oxygen osteoskeleton (SiO4 tetrahedra). The content of aluminum (11.7%) and iron (3.6%) is characteristic of montmorillonite and other aluminosilicate minerals, where aluminum is located in interlayer positions and ion-exchange centers. The content of potassium (2.8%), sodium (1.2%), magnesium (1.0%), and molybdenum (0.8%) indicates ion-exchange capacity and modification potential within the bentonite composition. In particular, the presence of Mo and Fe elements indicates that the bentonite was modified or originated from a source of contamination.

CONCLUSION

In conclusion, it can be stated that montmorillonite is the primary mineral in the chemical composition of the bentonite clay of the Azkamar deposit. The mineral montmorillonite plays an important role in the adsorption process. Furthermore, bentonite clay contains calcium and magnesium ions that are not involved in the adsorption process. Therefore, it is recommended to pre-enrich and modify bentonite clay for use as an adsorbent.

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IN SILICO ANALYSIS OF THE PHARMACOKINETIC AND DRUG-LIKE PROPERTIES OF β-(N-BENZOXAZOLIN-2-THIONE) PROPIONIC ACID

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INTRODUCTION

In recent years, the development of new biologically active compounds and the assessment of their pharmacokinetic properties at an early stage have become key aspects of the drug discovery process [1]. *In silico* approaches based on computer modeling enable the rapid analysis of numerous molecules, the screening of promising compounds, and a significant reduction in experimental costs. Predicting ADME (Absorption, Distribution, Metabolism, and Excretion) parameters is of particular importance when evaluating pharmacokinetic properties, as not all molecules with high biological activity possess favorable pharmacokinetic characteristics. Consequently, in modern drug design, ADME analysis is regarded as a crucial step alongside molecular docking, quantum-chemical calculations, and biological testing [2]. Benzoxazoline derivatives belong to a class of nitrogen- and oxygen-containing heterocyclic compounds; numerous studies have documented their antibacterial, antifungal, antiviral, anti-inflammatory, antioxidant, and antitumor activities [3]. In particular, 2-substituted benzoxazoline derivatives are recognized as promising structural scaffolds for the development of biologically active molecules, and the evaluation of their ADME profiles constitutes a vital stage in the selection of

new drug candidates [3]. In this context, the pharmacokinetic properties and drug-like characteristics of β-(N-benzoxazoline-2-thione) propionic acid were evaluated *in silico* using the SwissADME platform. The study analyzed the molecule‘s physicochemical properties, lipophilicity, water solubility, gastrointestinal absorption, bioavailability, and predicted medicinal chemistry parameters. The results indicate that this ligand is a promising candidate for future studies involving molecular docking, toxicological prediction, and biological activity.

MATERIALS AND METHODS

The β-(N-benzoxazoline-2-thione) propionic acid (HBOP) ligand was selected as the subject of the study. The two-dimensional molecular structure of the ligand was created using the molecule editor of the SwissADME platform, and its structural representation in SMILES (Simplified Molecular Input Line Entry System) format was automatically generated. The pharmacokinetic properties and drug-likeness of the ligand were evaluated *in silico* using the SwissADME online platform. The analysis comprehensively assessed the molecule‘s physicochemical properties (molecular mass, number of hydrogen bond donors and acceptors, topological polar surface area (TPSA), number of rotatable bonds), lipophilicity (iLOGP, XLOGP3, WLOGP, MLOGP, and SILICOS-IT), water solubility (ESOL, Ali, and SILICOS-IT models), pharmacokinetic parameters (gastrointestinal absorption, blood-brain barrier permeability, P-glycoprotein substrate status, and interaction with cytochrome P450 isoenzymes), and drug-likeness (Lipinski, Ghose, Veber, Egan, and Muegge rules). Furthermore, the ligand‘s bioavailability was analyzed using the Bioavailability Score, Bioavailability Radar, and BOILED-Egg models. In addition, the molecule‘s medicinal chemistry properties-including PAINS, Brenk alerts, synthetic accessibility, and lead-likeness parameters-were evaluated [1]. The obtained results were analyzed from a pharmacokinetic perspective to assess the ligand‘s potential as a promising bioactive compound.

RESULTS AND DISCUSSION

The pharmacokinetic and drug-like properties of the β-(N-benzoxazoline-2-thione)propionic acid ligand were evaluated *in silico* using the SwissADME platform. The computational results demonstrated that the ligand possesses promising physicochemical, pharmacokinetic, and medicinal chemistry characteristics (Table 1).

Table 1.

Key properties of β-(N-benzoxazolin-2-thione) propionic acid predicted on the SwissADME platform

№	Parameter	Value
1	Molecular formula	$C_{10}H_9NO_3S$
2	Molecular mass	223,25 g/mol
3	Topological polar surface area	87,46 Å^2
4	Number of H-bond donors	1
5	Number of H-bond acceptors	3
6	Number of rotatable bonds	3
7	Lipophilicity	1,31
8	Water solubility	Dissolves well
9	Gastrointestinal absorption	High
10	Blood-brain barrier penetration	No
11	Lipinski‘s rule	0 defects
12	Bioavailability	0,55
13	PAINS alerts	0
14	Ease of synthesis	2,61

Based on these results, the physicochemical and pharmacokinetic parameters of the β-(N-benzoxazoline-2-thione) propionic acid molecule indicate its potential as a pharmaceutical agent. The ligand has a molecular mass of 223.25 g/mol, which is well below the 500 g/mol threshold recommended by Lipinski. The fact that the number of hydrogen bond donors (1) and acceptors (3) falls within standard limits, combined with zero violations of Lipinski‘s rules, demonstrates that the molecule meets key criteria for orally administered drugs [4].

The ligand‘s topological polar surface area (TPSA) of 87.46 Å^2 and consensus lipophilicity value (Consensus LogP) of 1.31 indicate a balance between its hydrophilic and lipophilic properties. These parameters may positively influence

the molecule‘s transport across biological membranes and its bioavailability [1, 2]. Pharmacokinetic analysis predicted high gastrointestinal (GI) absorption for the ligand, with a bioavailability score of 0.55. These results suggest a high probability of effective absorption when the molecule is administered orally [1]. At the same time, the ligand‘s inability to cross the blood-brain barrier (BBB-impermeable) is considered a positive attribute for drug candidates not intended to target the central nervous system. Furthermore, the ligand exhibits good water solubility, and the absence of PAINS alerts (0 alerts) indicates a low probability of yielding false-positive results in biological screenings. A synthetic accessibility score of 2.61 suggests that the compound is relatively easy to synthesize under laboratory conditions. Results obtained via the SwissADME platform demonstrate that β-(N-benzoxazoline-2-thione)propionic acid is a promising bioactive ligand possessing favorable pharmacokinetic and drug-like properties. These data serve as a crucial theoretical foundation for further research involving molecular docking and the experimental evaluation of the ligand‘s biological activity. The key physicochemical parameters of β-(N-benzoxazoline-2-thione) propionic acid largely fall within the optimal range of the Bioavailability Radar diagram. Notably, parameters such as lipophilicity, molecular size, and polarity lie within acceptable ranges, indicating that the molecule possesses favorable pharmacokinetic properties (Figure 1).

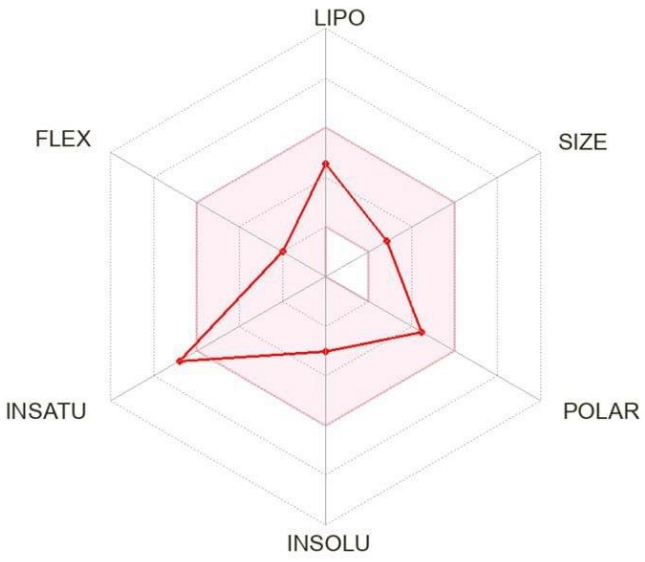

Figure 1. Bioavailability radar plot of β-(N-benzoxazolin-2-thione) propionic acid.
LIPO - lipophilicity; SIZE - molecular size; POLAR - polarity; INSOLU - insolubility; INSATU - unsaturation; FLEX - flexibility.

The BOILED-Egg model predicts high gastrointestinal absorption for the ligand but indicates a low probability of crossing the blood-brain barrier. This result is fully consistent with the "High GI absorption" and "BBB permeant - No" parameters determined on the SwissADME platform (Figure 2).

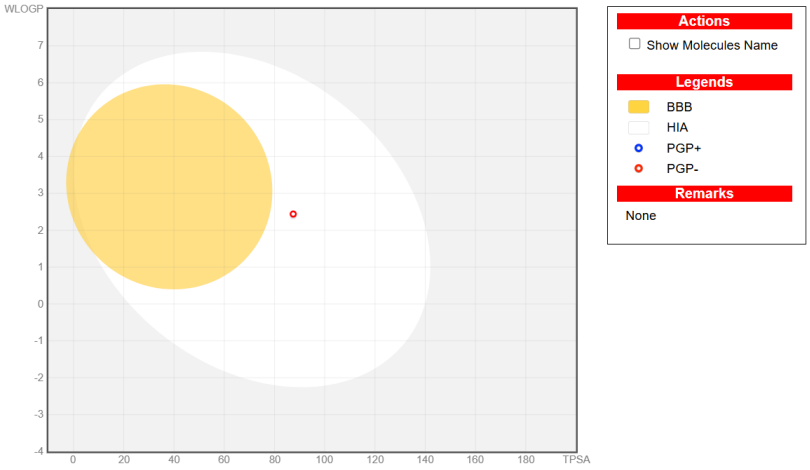

Figure 2. BOILED-Egg diagram of β-(N-benzoxazoline-2-thione) propionic acid; WLOGP - lipophilicity parameter; TPSA - topological polar surface area (Å²); BBB - blood-brain barrier penetration; HIA - gastrointestinal absorption; PGP+ - P-gp substrate; PGP- - non-P-gp substrate.

CONCLUSION

The pharmacokinetic and drug-like properties of β-(N-benzoxazolin-2-thione) propionic acid were evaluated *in silico* using the SwissADME platform. The results demonstrated that the ligand fully complies with Lipinski's rules, exhibits high gastrointestinal absorption, possesses a satisfactory bioavailability score (0.55) and good water solubility, and shows no PAINS alerts. Furthermore, the Bioavailability Radar and BOILED-Egg models confirmed that the molecule possesses a favorable pharmacokinetic profile. These findings indicate that β-(N-benzoxazolin-2-thione) propionic acid is a promising bioactive ligand and establish a significant theoretical basis for the in-depth study-via molecular

docking and experimental methods-of the biological activity of metal complexes synthesized from it.

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2-SECTION

YOSHLARNI KASBGA YO'NALTIRISHDA SUN'IY INTELLEKT VA RAQAMLI TEXNOLOGIYALARDAN FOYDALANISHNING AHAMIYATI

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Anotatsiya: *Mazkur maqolada yoshlarni erta yoshdan kasbga yo'naltirishda Sun'iy intellekt va raqamli texnologiyalardan foydalanishning psixologik xususiyatlari tahlil qilingan. Sun'iy intellekt asosidagi tizimlarning o'quvchilarning qiziqishlari, qobiliyatlari va shaxsiy xususiyatlarini aniqlash, mehnat bozori talablarini tahlil qilish hamda individual kasbiy rivojlanish yo'nalishlarini belgilashdagi ahamiyati yoritilgan. Shuningdek, Sun'iy intellekt vositalarining kasb tanlash jarayonidagi afzalliklari bilan bir qatorda, ularni qo'llashda uchrashi mumkin bo'lgan psixologik va axloqiy muammolar ham ko'rib chiqilgan.*

Kalit so'zlar: *Sun'iy intellekt, raqamli texnologiyalar, kasbga yo'naltirish, psixologik xususiyatlar, kasb tanlash, mehnat bozori, o'quvchilar, kasbiy rivojlanish.*

Abstract: *This article examines the role of artificial intelligence and digital technologies in guiding young people toward career choices from an early age. It highlights the importance of artificial intelligence-based systems in identifying students' interests, abilities, and personal characteristics, analyzing labor market demands, and providing individualized career development recommendations. The article also discusses the advantages of using artificial intelligence in career guidance, as well as the psychological and ethical challenges associated with its implementation. The findings indicate that the effective and responsible use of artificial intelligence technologies can significantly improve the efficiency of career guidance.*

Keywords: *artificial intelligence, digital technologies, career guidance, career choice, psychological characteristics, labor market, students, professional development.*

KIRISH

Bugungi dunyoda, mehnat bozorida raqobat yuqori va tez o'zgarib borayotgani sezilmoqda va shaxsiy ko'nikma talablari tufayli kasbga yo'naltirish tobora muhim ahamiyat kasb etmoqda. Ko'pgina maktab va universitet bitiruvchilari o'zlari uchun eng qiziqarli va istiqbolli ish sohasini aniq

tushunishmaydi. Shu bilan birga, to'g'ri tanlangan kasb shaxslarning muvaffaqiyatli o'zini o'zi anglashi va mamlakatning umumiy iqtisodiy farovonligining muhim elementi bo'lgan munosib hayot sifatini ta'minlashning kalitidir. Shuning uchun, kasbga yo'naltirish tobora ommalashib bormoqda va hukumat va biznes tomonidan qo'llab-quvvatlanmoqda va bu sohadagi ilmiy tadqiqotlar dolzarbdir. Kasbga yo'naltirishga an'anaviy yondashuvlar testlar, so'rovnomalar va mutaxassislar bilan maslahatlashuvlar kabi usullardan foydalanishni o'z ichiga oladi. Biroq, texnologiyalarning rivojlanishi bilan kasbga yo'naltirish uchun ko'plab innovatsion va yangi vositalar va imkoniyatlar paydo bo'ldi. Sun'iy intellekt, mashinani o'rganish, ma'lumotlarni tahlil qilish va boshqalar kabi zamonaviy texnologiyalardan insonning qobiliyatlari, iste'dodlari va qiziqishlarini aniqlash uchun samarali foydalanish mumkin. Ushbu texnologiyalar tezroq va aniqroq kasbga yo'naltirish imkonini beradi, bu esa xatolar ehtimolini kamaytiradi. Bundan tashqari, kasbga yo'naltirishda zamonaviy texnologiyalardan foydalanish bu jarayonni yoshlar uchun yanada oson qilishi mumkin.

ASOSIY QISM

Rossiya va xorijdagi ko'plab tadqiqotchilar professional o'zini o'zi belgilash va turli sohalarda qarorlarni qo'llab-quvvatlash tizimlarini rivojlantirish masalasini ko'rib chiqdilar. Kasbiy yo'naltirish faoliyatida innovatsion yondashuvlarga bag'ishlangan so'nggi ilmiy nashrlar ushbu muammolarni hal qilishda yuqori samaradorlikka erishish uchun zamonaviy texnologiyalardan foydalanish muhimligini ko'rsatadi.

Tadqiqot natijalari shuni ko'rsatdiki, Sun'iy intellektga asoslangan kasbiy yo'naltirish tizimlari o'quvchilarning shaxsiy potentsialini ochish, mehnat bozoridagi tendensiyalarga mos kasb tanlash, mustaqil fikrlash va o'zini anglashni kuchaytirishda muhim vosita bo'lib xizmat qiladi. Ular an'anaviy maslahat markazlariga nisbatan interaktivlik, real vaqt rejimida tavsiya berish va ko'p parametrli tahlil imkoniyatlari bilan ajralib turadi.SI vositalari kasb tanlash jarayonini soddalashtiradi, uni o'quvchiga qiziqarliqiladi va eng muhimi

esa ishonch uyg‘otadi. Bu esa o’quvchining kelajakdagi kasbiga nisbatan ijobiy munosabatda bo’lishiga yordam beradi. Ta’lim muassasalari bunday ilovalarni o’z tizimlariga integratsiya qilish orqali o’quvchilarga shaxsiy yondashuvni kuchaytirishlari mumkin. Biroq bu imkoniyatlardan oqilona foydalanish uchun qator omillarni hisobga olish zarur . Eng avvalo, o’qituvchilar va psixologlar SI vositalari bilan ishlash ko’nikmalariga ega bo’lishi kerak. Shuningdek, SI vositalarining tavsiyalari tanqidiy tahlil qilinishi, ularni mehnat bozorining real ehtiyojlari bilan solishtirish mexanizmlari ishlab chiqilishi lozim. Eng muhimi, Sun’iy intellekt insonning qaror qabul qilish vakolatini emas, balki unga yo’l ko’rsatuvchi vosita sifatida qolishi kerak.[1]

Bugungi kunda ish beruvchi tashkilotlar diplomga emas, balki insonda mavjud ko’nikmalarga diqqat qaratmoqda. Sanoatdagi bunday jadal rivojlanish insondagi hissiy aql, muloqot va tanqidiy fikrlash kabi ko’nikmalarni dastlabki o’ringa qo’ymoqda desak mubolag’a bo’lmaydi. Sun’iy intellekt vositalari esa bunday ko’nikmalarni baholashda va ularni tegishli kasbiy yo’nalishlarga moslashtirishda, talabalarning shaxsiy xususiyatlarini kasbiga mos kelishi yoki kelmasligini aniqlashda juda katta yordam bera oladi. Ushbu o’zgarish talabalarning nafaqat o’zlari qiziqadigan kasblarni tanlashlarini, balki muvaffaqiyatga erishish uchun zarur bo’lgan kompetentsiyalarni rivojlantirishlarini ham ta’minlaydi.[4]

Sun’iy intellekt va raqamli texnologiyalarning kasb tanlashdagi ahamiyatini aynan quyidagilarda ko’rishimiz mumkin:

1. **Shaxsiylashtirilgan kasb tanlash tahlili.** Sun’iy intellekt asosida yaratilgan zamonaviy platformalar talabaning bilim darajasi, qobiliyati va qiziqishlarini chuqur tahlil qiladi. An'anaviy kasbga yo’naltirish testlaridan farqli ravishda, bunday tizimlar foydalanuvchi haqidagi ma'lumotlarni doimiy ravishda yangilab, individual tavsiyalar beradi. Masalan, ijodkorlik va muloqot ko’nikmalari kuchli bo’lgan talabalarga marketing, dizayn yoki inson resurslari kabi kasblar tavsiya qilinishi mumkin. Shu bilan birga, tanlangan kasb uchun zarur bilim va ko’nikmalarni rivojlantirish bo’yicha tavsiyalar ham beriladi.

2. **Mehnat bozorini tahlil qilish va istiqbolli kasblarni aniqlash.** Sun’iy intellekt katta hajmdagi ma'lumotlarni qayta ishlash orqali mehnat bozoridagi talab va o’zgarishlarni tahlil qiladi. Natijada talabalar kelajakda qaysi kasblarga ehtiyoj ortishini va qaysi mutaxassisliklar uzoq muddat davomida dolzarb bo’lib qolishini oldindan bilish imkoniyatiga ega bo’ladilar. Shuningdek, ma’lumotlar tahlili, barqaror rivojlanish va raqamli texnologiyalar bilan bog'liq yangi kasblar haqida ham ma'lumot beradi.

3. **Kasb uchun zarur ko’nikmalarni aniqlash.** Sun’iy intellekt talabaning mavjud bilim va malakasini tanlangan kasb talablari bilan taqqoslaydi. Agar ayrim ko’nikmalar yetishmasa, ularni rivojlantirish uchun mos kurslar, amaliy mashg'ulotlar yoki boshqa ta'lim resurslarini tavsiya qiladi. Bu esa talabaning tanlagan kasbi bo’yicha yetuk mutaxassis bo’lib shakllanishiga yordam beradi.

4. **Kasb tanlashga yo’naltirilgan rivojlanish rejasi.** Sun’iy intellekt nafaqat mos kasbni tavsiya qiladi, balki unga erishish uchun bosqichma-bosqich rivojlanish rejasini ham ishlab chiqadi. Ushbu rejada onlayn kurslar, seminarlar, mentorlik dasturlari va malaka oshirish imkoniyatlari tavsiya etilib, talabaning kasbiy rivojlanishiga ko’maklashiladi.

5. **Hissiy va ijtimoiy ko’nikmalarni baholash.** Kasb tanlashda faqat bilim va malaka emas, balki hissiy hamda ijtimoiy ko’nikmalar ham muhim ahamiyatga ega. Sun’iy intellekt insonning muloqot qilish, jamoada ishlash va muammolarni samarali hal etish qobiliyatlarini baholaydi. Bu esa talabaning o’ziga mos kasbni tanlashi va kelajakda o’z faoliyatida muvaffaqiyatga erishishiga yordam beradi.

6. **Kasb tanlashda psixologik qo’llab quvvqtlash.** Kasb tanlashda yuzaga keladigan qiyinchiliklarda yuzaga keladigan stresslarni kamaytiradi. Motivatsiya beradi.[2]

Yuqoridagi imkoniyatlar bilan birgalikda jiddiy cheklovlar ham mavjud. Tadqiqotlarning aksariyat qismida Sun’iy intellekt integratsiyasining afzalliklari ta’kidlangan bo’lsa-da, ularning oz qismi mumkin bo’lgan psixologik

oqibatlarga, jumladan, texnologik jihatdan qaram bo'lib qolish yoki o'z ishiga ishonchsizlikka tushib qolish ehtimoliga e'tibor qaratadi. Bu dinamikalar o'ziga ishonch va natijaga bo'lgan umidlar tushunchalariga mos keladigan bo'lsa-da, munosabatlarni o'rganadigan ko'plab empirik ma'lumotlar mavjud emas. Shuningdek, gender farqlari, axloqiy masalalar va kontekstual xilma-xillik hali o'rganilmagan, bu mavjud diskurslar asosan texno-optimistik ekanligini anglatadi [3]

XULOSA

Sun'iy intellekt va raqamli texnologiyalar yoshlarni kasbga yo'naltirish jarayonini yanada samarali, shaxsga yo'naltirilgan va zamonaviy talablar asosida tashkil etish imkonini beradi. Ushbu texnologiyalar o'quvchilarning qobiliyatlari, qiziqishlari va shaxsiy xususiyatlarini chuqur tahlil qilib, ularga mehnat bozori ehtiyojlariga mos kasblarni tanlashda yordam beradi. Shu bilan birga, Sun'iy intellekt tavsiyalari mutaxassislar, pedagoglar va psixologlar tavsiyalari bilan uyg'unlashtirilgan holda qo'llanilgandagina yuqori samaradorlikka erishiladi. Kelgusida ta'lim tizimida Sun'iy intellektdan oqilona va mas'uliyatli foydalanish yoshlarning ongli kasb tanlashi hamda raqobatbardosh mutaxassis bo'lib shakllanishiga xizmat qiladi.

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BARQAROR RIVOJLANISH VA GLOBAL INNOVATSIYALAR SHAROITIDA “ADABIY OBZORLAR BAZASI” ELEKTRON ILMIY PLATFORMASINI YARATISHNING NAZARIY VA AMALIY ASOSLARI

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Annotatsiya. *Mazkur maqolada barqaror rivojlanish va global innovatsiyalar sharoitida “Adabiy obzorlar bazasi” elektron ilmiy platformasini yaratishning nazariy va amaliy asoslari yoritilgan. Adabiy obzorlarni yagona raqamli muhitda jamlash, tizimlashtirish va ulardan samarali foydalanishning dolzarbligi asoslangan. Sun`iy intellekt texnologiyalarining ilmiy tadqiqotlarda, xususan, adabiy obzorlarni qidirish, tasniflash va tahlil qilish jarayonidagi imkoniyatlari hamda ularning qo‘llanilish xususiyatlari tahlil qilingan. Tadqiqot natijasida ishlab chiqilgan platformaning konseptual va funksional modeli tavsiflanib, uning ilmiy axborotni markazlashtirish, adabiyotshunoslik tadqiqotlari samaradorligini oshirish, milliy adabiy merosni raqamlashtirish hamda ilmiy hamkorlikni rivojlantirishdagi ahamiyati yoritilgan. Shuningdek, platformaga semantik qidiruv, tavsiya tizimi va bibliometrik tahlil modullarini integratsiya qilish istiqbollari ko‘rsatilib, uning barqaror rivojlanish maqsadlari va global innovatsion jarayonlarga qo‘shadigan hissasi asoslab berilgan.*

Abstract. *This article examines the theoretical and practical foundations for developing the “Literary Review Database” electronic scientific platform in the context of sustainable development and global innovation. It substantiates the necessity of collecting, systematizing, and providing efficient access to literary reviews within a unified digital environment. The study analyzes the potential and application of artificial intelligence (AI) technologies in scientific research, particularly in the processes of searching, classifying, and analyzing literary reviews. As a result of the research, the conceptual and functional model of the proposed platform is presented, highlighting its role in centralizing scientific information, improving the efficiency of literary studies, digitizing the national literary heritage, and promoting academic collaboration. Furthermore, the paper discusses the prospects of*

integrating semantic search, recommendation systems, and bibliometric analysis modules into the platform and demonstrates its potential contribution to achieving sustainable development goals and fostering global innovation.

Kalit so‘zlar: *adabiy obzor, elektron ilmiy platforma, sun`iy intellekt, raqamlashtirish, barqaror rivojlanish, global innovatsiyalar, semantik qidiruv, bibliometrik tahlil, adabiyotshunoslik, ilmiy axborot*

Keywords: *literary review, electronic scientific platform, artificial intelligence (AI), digitalization, sustainable development, global innovation, semantic search, bibliometric analysis, literary studies, scientific information.*

KIRISH

Zamonaviy ilm-fan va ta`lim tizimida raqamli texnologiyalar hamda sun`iy intellekt (Artificial Intelligence – AI) imkoniyatlaridan samarali foydalanish ilmiy tadqiqotlar sifatini oshirishning muhim omillaridan biriga aylanmoqda. Ilmiy axborot hajmining tobora ortib borishi mavjud manbalarni tizimlashtirish, tezkor izlash, tahlil qilish va ulardan oqilona foydalanishni taqozo etmoqda. Shu jihatdan ilmiy ma`lumotlarni raqamlashtirish va elektron platformalar orqali foydalanuvchilarga taqdim etish barqaror rivojlanish hamda global innovatsiyalarni ta`minlashning muhim yo‘nalishlaridan biri hisoblanadi.

Adabiyotshunoslikda adabiy tanqid janrlari adabiy jarayon taraqqiyotini yoritish, badiiy asarlarni ilmiy-estetik nuqtai nazardan baholash hamda adabiy rivojlanish tendensiyalarini aniqlashda muhim o‘rin tutadi. Ana shunday janrlardan biri bo‘lgan adabiy obzor muayyan davr adabiy jarayonini tizimli ravishda tahlil qilish, mavjud ilmiy qarashlarni umumlashtirish va asoslangan ilmiy xulosalar chiqarish imkonini beruvchi muhim ilmiy vositadir. Adabiy obzorning ilmiy qimmati uning izchilligi, tahliliy yondashuvi, umumlashtirish xususiyati hamda mantiqiy xulosalarga asoslanishida namoyon bo‘ladi. Shu sababli adabiy obzor adabiyotshunoslik tadqiqotlarining metodologik poydevorini shakllantiruvchi muhim janrlardan biri sifatida e`tirof etiladi.

Bugungi kunda o‘zbek va jahon adabiyotida yaratilgan adabiy obzorlarni qiyosiy o‘rganish ularning nazariy asoslari, metodologik yondashuvlari va ilmiy ahamiyatini chuqurroq anglash imkonini bermoqda. Xususan, chet el

adabiyotida yaratilgan obzorlar keng qamrovli nazariy yondashuvlar, tarixiy-adabiy hamda madaniy tahlil usullariga tayanishi bilan ajralib tursa, o‘zbek adabiyotidagi obzorlar milliy adabiy meros, tarixiy xotira va ijtimoiy-estetik qadriyatlarni yoritishga ko‘proq yo‘naltirilgan. Ushbu umumiy va farqli jihatlarni qiyosiy tahlil qilish adabiy obzor janrining ilmiy imkoniyatlarini yanada kengroq ochib beradi.

Shu bilan birga, zamonaviy ilmiy tadqiqotlarda sun`iy intellekt vositalaridan foydalanish adabiy obzor tayyorlash metodologiyasini yangi bosqichga olib chiqmoqda. ChatGPT, Gemini, Claude, Smodin, Elicit, Zotero va boshqa zamonaviy platformalar ilmiy manbalarni izlash, saralash, guruhlash, bibliografik ma`lumotlarni shakllantirish hamda dastlabki tahlillarni amalga oshirishda tadqiqotchiga samarali yordam bermoqda. Biroq bunday texnologiyalardan foydalanishda ularning imkoniyatlari bilan bir qatorda mavjud cheklovlarini, xususan, sun`iy intellekt tomonidan faktik xatolar (hallutsinatsiyalar) yuzaga kelishi ehtimolini ham hisobga olish zarur. Shu sababli AI vositalari ilmiy tadqiqotda mustaqil manba emas, balki tadqiqotchining ilmiy faoliyatini qo‘llab-quvvatlovchi yordamchi vosita sifatida qo‘llanilishi maqsadga muvofiqdir.

O‘zbek adabiyotshunosligida adabiy obzorlar, tanqidiy maqolalar, ilmiy tadqiqotlar va o‘quv materiallari turli ilmiy nashrlarda tarqoq holda saqlanmoqda. Bu esa tadqiqotchilar, professor-o‘qituvchilar, doktorantlar va talabalar uchun zarur ilmiy axborotni tezkor topish hamda undan tizimli foydalanishda qator qiyinchiliklarni yuzaga keltirmoqda. Mazkur holat adabiy obzorlarni yagona elektron bazada jamlash, ularni zamonaviy axborot texnologiyalari asosida boshqarish va ilmiy muomalaga samarali kiritish zaruratini yuzaga keltiradi.

Shu nuqtai nazardan, ushbu maqolada “Adabiy obzorlar bazasi” elektron ilmiy platformasini yaratishning nazariy va amaliy asoslari yoritiladi. Platforma adabiy obzorlar, ilmiy maqolalar va bibliografik ma`lumotlarni yagona raqamli muhitda jamlash, sun`iy intellekt asosida qidirish va tizimlashtirish, ilmiy

axborotdan foydalanish samaradorligini oshirish hamda adabiyotshunoslik sohasida innovatsion raqamli infratuzilmani shakllantirishga xizmat qiladi. Mazkur platformani yaratish ilmiy axborotni markazlashtirish, milliy adabiy merosni raqamli shaklda saqlash va ilmiy tadqiqotlar sifatini oshirish orqali barqaror rivojlanish hamda global innovatsiyalarni qo‘llab-quvvatlashga xizmat qiluvchi muhim tashabbuslardan biri sifatida baholanadi.

ASOSIY QISM

Raqamli transformatsiya jarayonlarining jadallashuvi ilmiy tadqiqotlarni tashkil etish, ilmiy axborotni qayta ishlash va undan foydalanish usullarini tubdan o‘zgartirmoqda. Ayniqsa, sun`iy intellekt (Artificial Intelligence, AI) texnologiyalarining rivojlanishi ilmiy ma`lumotlarni izlash, saralash, tahlil qilish va tizimlashtirish imkoniyatlarini sezilarli darajada kengaytirdi. Natijada adabiyotshunoslik sohasida ham ilmiy manbalar bilan ishlashning an`anaviy usullari zamonaviy raqamli texnologiyalar bilan boyitilmoqda. Biroq ilmiy manbalar sonining ortib borishi ularni izchil tartibga solish, yagona elektron tizimga keltirish va ilmiy muomalada samarali foydalanish zaruratini yuzaga chiqarmoqda.

Adabiy obzorlar muayyan davr adabiy jarayoni, adabiy tanqid taraqqiyoti va ilmiy qarashlarni umumlashtiruvchi muhim ilmiy manba hisoblanadi. Ular nafaqat alohida badiiy asarlar yoki ijodkorlar faoliyatini tahlil qiladi, balki adabiy jarayonning umumiy rivojlanish tendensiyalarini aniqlash, mavjud ilmiy qarashlarni qiyoslash va yangi ilmiy xulosalar ishlab chiqishda ham muhim metodologik asos vazifasini bajaradi. Shu sababli adabiy obzorlarning tizimli ravishda jamlanishi, ilmiy mezonlar asosida tasniflanishi va tadqiqotchilar uchun ochiq elektron muhitda taqdim etilishi bugungi adabiyotshunoslikning dolzarb vazifalaridan biridir.

Zamonaviy AI texnologiyalari mazkur vazifalarni samarali amalga oshirish uchun keng imkoniyatlar yaratmoqda. Xususan, ChatGPT, Gemini, Claude, Smodin, Elicit va Zotero kabi vositalar ilmiy adabiyotlarni qidirish, bibliografik ma`lumotlarni shakllantirish, matnlarni mavzular bo‘yicha

guruhlash, kalit so‘zlarni aniqlash hamda dastlabki analitik tahlillarni bajarishda tadqiqotchining ishini yengillashtiradi. Bunday vositalar ilmiy izlanish jarayonining tezkorligini oshirsa-da, ular tomonidan taqdim etilgan ma`lumotlarni tanqidiy tahlil qilish va ishonchli manbalar bilan solishtirish zarur. Chunki sun`iy intellekt ayrim hollarda mavjud bo‘lmagan ma`lumotlarni yaratishi yoki faktik xatolarga yo‘l qo‘yishi mumkin. Shuning uchun AI ilmiy tadqiqotda muallif fikrini almashtiruvchi vosita emas, balki ilmiy faoliyat samaradorligini oshiruvchi yordamchi texnologiya sifatida qaralishi lozim.

Mazkur imkoniyatlarni adabiyotshunoslik sohasiga tatbiq etish zarurati *“Adabiy obzorlar bazasi”* elektron ilmiy platformasini yaratish g‘oyasini ilgari suradi. Ushbu platforma adabiy obzorlar, ilmiy maqolalar, dissertatsiyalar, bibliografik ma`lumotlar va boshqa ilmiy resurslarni yagona raqamli muhitda jamlashni nazarda tutadi. Platformada materiallar adabiyot davrlari, janrlar, mualliflar, ilmiy yo‘nalishlar hamda kalit so‘zlar asosida tasniflanadi. Bu esa foydalanuvchilarga zarur ilmiy axborotni qisqa vaqt ichida topish, o‘zaro bog‘liq manbalarni aniqlash va tadqiqot jarayonini samarali tashkil etish imkonini beradi.

Platformaning muhim afzalliklaridan biri uning sun`iy intellekt elementlari bilan integratsiyalashganidir. AI asosidagi *semantik qidiruv (Semantic Search)* foydalanuvchining so‘rovini faqat kalit so‘zlar orqali emas, balki mazmun jihatidan ham tahlil qiladi. Natijada tadqiqot mavzusiga yaqin bo‘lgan adabiy obzorlar, ilmiy maqolalar va boshqa resurslar avtomatik ravishda tavsiya etiladi. Bundan tashqari, platformada *bibliometrik tahlil (Bibliometric Analysis)* vositalarini joriy etish orqali muayyan mavzu bo‘yicha eng ko‘p murojaat qilingan manbalar, faol tadqiqotchilar, ilmiy yo‘nalishlarning rivojlanish dinamikasi hamda adabiy tanqid taraqqiyotining statistik ko‘rsatkichlarini aniqlash imkoniyati yaratiladi. Bu esa ilmiy tadqiqotlarning sifatini oshirish bilan birga, yangi ilmiy izlanishlar uchun istiqbolli yo‘nalishlarni belgilashga xizmat qiladi.

“Adabiy obzorlar bazasi” platformasi nafaqat ilmiy axborotni saqlovchi elektron resurs, balki adabiyotshunoslik sohasida zamonaviy raqamli infratuzilmani shakllantiruvchi innovatsion tizim sifatida ham muhim ahamiyat kasb etadi. Mazkur platformadan professor-o‘qituvchilar, ilmiy xodimlar, doktorantlar, magistrantlar, talabalar hamda mustaqil tadqiqotchilar foydalanishlari mumkin. Yagona elektron bazaning mavjudligi ilmiy manbalarni takror izlashga ketadigan vaqtni qisqartiradi, tadqiqotlar sifati va samaradorligini oshiradi hamda ilmiy hamkorlikni rivojlantirish uchun qulay sharoit yaratadi. Shu bilan birga, platforma milliy adabiy merosni raqamli shaklda saqlash, ilmiy axborotdan ochiq va tizimli foydalanishni ta‘minlash hamda adabiyotshunoslikni zamonaviy axborot texnologiyalari bilan uyg‘unlashtirishga xizmat qiladi.

Mazkur platformaning joriy etilishi barqaror rivojlanish tamoyillarini qo‘llab-quvvatlash nuqtai nazaridan ham muhim ahamiyatga ega. Ilmiy axborotning ochiqligi, undan teng foydalanish imkoniyatining kengayishi va raqamli infratuzilmaning rivojlantirilishi ilm-fan hamda ta‘lim tizimining barqaror taraqqiyotiga xizmat qiladi. Shuningdek, sun`iy intellekt texnologiyalarini adabiyotshunoslik tadqiqotlariga integratsiya qilish global innovatsion jarayonlarning milliy ilmiy maktabda qo‘llanilishiga zamin yaratadi. Natijada “Adabiy obzorlar bazasi” elektron ilmiy platformasi ilmiy axborotni markazlashtirish, adabiy merosni raqamlashtirish, ilmiy hamkorlikni kuchaytirish va zamonaviy tadqiqot metodlarini joriy etish orqali barqaror rivojlanish hamda global innovatsiyalar maqsadlariga xizmat qiluvchi istiqbolli ilmiy loyiha sifatida namoyon bo‘ladi.

Raqamli texnologiyalar va sun`iy intellekt (Artificial Intelligence, AI)ning jadal rivojlanishi ilmiy axborotni yaratish, saqlash va undan foydalanish usullarini tubdan o‘zgartirmoqda. Ayniqsa, ilmiy manbalar hajmining ortib borishi ularni tizimli ravishda boshqarish, tezkor qidirish va ilmiy muomalaga samarali kiritishni taqozo etmoqda.

Mazkur ehtiyojdan kelib chiqib, tadqiqot doirasida “Adabiy obzorlar bazasi” elektron ilmiy platformasining konseptual va funksional modeli ishlab chiqildi. Platforma adabiy obzorlarni to‘plash, saqlash, tasniflash, qidirish va ilmiy tahlil qilish jarayonlarini yagona elektron muhitda amalga oshirishga mo‘ljallangan.

Platformaning funksional tuzilmasi ilmiy axborotni boshqarish tamoyillariga asoslangan. Bosh sahifada foydalanuvchi uchun qulay navigatsiya tizimi, qidiruv maydoni, o‘zbek va jahon adabiyotiga oid bo‘limlar, statistik ma`lumotlar hamda foydali resurslar joylashtirilgan. *“Adabiy obzorlar bazasi”* elektron ilmiy platformasining bosh sahifasi quyidagicha berilishi taklif qilindi:



Platformaning bosh sahifasida qidiruv tizimi, o‘zbek va jahon adabiyoti bo‘limlari, statistik modul hamda foydali resurslar jamlangan.

Platformaning keyingi rivojlanish bosqichida sun`iy intellekt texnologiyalarini integratsiya qilish rejalashtirilgan. Semantik qidiruv, tavsiya tizimi va bibliometrik tahlil modullari ilmiy izlanishlar samaradorligini oshirishga xizmat qiladi.

XULOSA

Zamonaviy raqamli texnologiyalar va sun`iy intellektning jadal rivojlanishi ilmiy axborotni boshqarishning yangi yondashuvlarini shakllantirmoqda. Mazkur tadqiqot doirasida adabiy obzorlarni tizimlashtirish,

saqlash va ulardan foydalanish samaradorligini oshirish maqsadida *“Adabiy obzorlar bazasi”* elektron ilmiy platformasining konseptual va funksional asoslari yoritildi. Tadqiqot natijalari shuni ko‘rsatadiki, adabiy obzorlarni yagona elektron muhitda jamlash ilmiy axborotning tarqoqligini kamaytirish, manbalardan foydalanishni soddalashtirish hamda adabiyotshunoslik tadqiqotlarining sifatini oshirishga xizmat qiladi.

Ishlab chiqilgan platforma modeli adabiy obzorlarni adabiy yo‘nalishlar, janrlar, mualliflar va mavzular bo‘yicha tizimli tasniflash imkonini beradi. Platformaning modulli tuzilishi qidiruv, statistik tahlil va ilmiy axborotni boshqarish jarayonlarini yagona tizimda amalga oshirish uchun qulay sharoit yaratadi. Kelgusida platformaga sun‘iy intellekt asosidagi *semantik qidiruv (Semantic Search), tavsiya tizimi (Recommendation System)* hamda *bibliometrik tahlil (Bibliometric Analysis)* modullarini integratsiya qilish ilmiy axborotdan foydalanish samaradorligini yanada oshirish imkonini beradi.

Tadqiqotning ilmiy ahamiyati shundaki, unda o‘zbek adabiyotshunosligida adabiy obzorlarni raqamlashtirish va ularni yagona elektron bazada boshqarishning konseptual yondashuvi taklif etildi. Amaliy jihatdan esa platforma professor-o‘qituvchilar, ilmiy xodimlar, doktorantlar, magistrantlar va talabalar uchun adabiy obzorlarni izlash, tahlil qilish hamda ilmiy tadqiqotlarda ulardan samarali foydalanishga xizmat qiluvchi raqamli infratuzilmani shakllantirish imkoniyatini yaratadi.

Umuman olganda, *“Adabiy obzorlar bazasi”* elektron ilmiy platformasini rivojlantirish va uni zamonaviy axborot texnologiyalari bilan boyitish milliy adabiyotshunoslikning raqamli transformatsiyasini jadallashtirish, ilmiy axborot almashinuvini takomillashtirish hamda barqaror rivojlanish va global innovatsiyalar sharoitida ilmiy tadqiqotlar samaradorligini oshirishga munosib hissa qo‘sha oladi.

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SAFEGUARDING ETHNO-PRAGMATIC CULTURAL VALUES VIA GENERATIVE AI: FORMAL MATRIX MODELING OF KINSHIP AND AFFINITY SYSTEMS IN UZBEK, RUSSIAN, AND ENGLISH

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Abstract - *Preserving intangible linguistic and sociocultural assets represents a core imperative for global sustainable development within the current computational landscape. This study presents an exhaustive comparative, typological, and diachronic evaluation of kinship and affinity configurations across three distinct morphosyntactic structures: English (analytical Germanic), Russian (inflectional Slavic), and Uzbek (agglutinative Turkic). By integrating formal algebraic feature decomposition with corpus-based textual validation across the British National Corpus (BNC), Russian National Corpus (RNC), and Uzbek National Corpus (UzNC), this paper maps the structural trajectories and evolutionary transitions of relational systems. We demonstrate how generative Artificial Intelligence (AI) and modern Large Language Models (LLMs) can be combined with rigid semantic ontology mapping to mitigate the digital flattening of dense ethno-pragmatic frameworks. Our findings reveal that while English relies heavily on structural simplification and Russian preserves deep asymmetric inflectional categories, the Uzbek configuration retains an intricate relational matrix governed by absolute seniority and lineality. Finally, we propose an adaptable neural-symbolic embedding architecture that allows translation models to respect highly localized, culturally bound relational identifiers.*

Keywords - *Kinship Architectures, Componential Modeling, Artificial Intelligence, Computational Philology, Language Sustainability, Cultural Heritage.*

I. INTRODUCTION

The escalating pressure of digital homogenization and global communication networks introduces a severe, unmapped risk of degradation to

the world's intangible cultural legacy. Among the most vulnerable linguistic targets are the highly specific micro-semantic configurations found within the lexicon of natural languages. Relational systems - specifically kinship and affinity terminologies - serve as primary cognitive mirrors that register a society's operational history, domestic legal evolution, and ethno-pragmatic interaction boundaries.

The maintenance of these highly specialized semantic domains relates directly to the United Nations Sustainable Development Goals (SDGs), particularly SDG 11.4, which emphasizes safeguarding cultural and linguistic diversity. However, traditional descriptive ethnolinguistics cannot provide the mathematical scalability or formalized frameworks required to preserve and map these intricate social taxonomies into modern cloud platforms, natural language processing (NLP) systems, and artificial intelligence models.

This research paper constructs a formal, machine-readable bridge connecting traditional structural philology with modern generative artificial intelligence (AI). To evaluate cross-linguistic friction, we target three contrasting morphological systems:

1. **English:** An analytical Germanic language driven by structural simplification, extensive semantic reduction, and legal abstractness.
2. **Russian:** An inflectional Slavic language showing strong resistance to lexical symmetry, thereby preserving acute morphosemantic asymmetry within its marriage-based (affinal) sub-networks.
3. **Uzbek:** An agglutinative Turkic language displaying extreme ethno-pragmatic density, where seniority markers, gender parameters, and absolute maternal/paternal lines remain entirely unneutralized and morphologically explicit.

The core computational problem stems from "structural friction" occurring when modern multilingual Large Language Models (LLMs, such as GPT, Claude, or Llama variants) process asymmetric relational concepts.

Because these models are trained predominantly on massive English-centric datasets, they inherently internalize an analytical bias toward linear abstraction. When this structural bias is applied to non-Western language frameworks, the AI frequently neutralizes critical socio-hierarchical boundaries. This leads not only to errors in machine translation but also to a phenomenon we define as **Digital Semantic Erosion**. By applying algebraic decomposition and validating the output through national text repositories, this research supplies a formal vector-based methodology to build culturally aware, bias-corrected AI systems.

II. Methodology and Data Materials

To eliminate individual subjective bias and secure empirical precision, this study leverages a dual approach combining structuralist algebraic feature mapping with computational corpus linguistics.

A. Formal Algebraic Feature Decomposition

Individual kinship and affinity markers are evaluated not as isolated vocabulary units, but as multi-dimensional vectors containing systematic bundles of semantic primitives (sememes). Adapting the classic frameworks of Goodenough and Lounsbury, we isolate six primary differential constraints that construct the structural invariant of any kinship term (K):

- G (Generation): The generational distance relative to the Ego. Here, G^{O} -indicates the contemporary generation, $G^{+1}-$ indicates the parental stratum, $G^{+2}-$ indicates the grandparents, and $G^{-1}-$ defines descendants.
- L (Lineality): The structural path of lineage. Direct ascendancy/descendancy lines are coded as L_d, while collateral or lateral branches are coded as L_c.
- S (Sex): The biological sex of the target referent (S_m for male, S_f for female).
- C (Consanguinity): The ontological nature of the relationship, separating blood ties (C_c) from affinal unions established through marriage (C_a).

- P (Polarity): The structural lineage split. We differentiate paternal (patrilateral) origins (P_p) from maternal (matrilateral) origins (P_m). Where this distinction is structurally non-existent, the parameter is neutralized (P_o).
- A (Age Seniority): The absolute age ranking relative to the Ego or an intermediate link within a singular generation. The marker A_+ signals an elder status, while A_- indicates a younger individual.

The mathematical construction of the semantic vector for a given relational term is expressed via cross-multiplication:

$$K = [G^n \times L_x \times S_y \times C_z \times P_w \times A_k]$$

Where the algebraic subscript and superscript variables define the specific states of each semantic primitive:

- $n \in Z$ determines the generational distance shift (e.g., +1, 0, -1).
- $x \in \{d, c\}$ defines the axis of lineage (d for direct, c for collateral).
- $y \in \{m, f, 0\}$ denotes the gender vector (m for male, f for female, 0 for neutralized).
- $z \in \{c, a\}$ specifies the nature of the relationship (c for consanguineous blood ties, a for affinal marriage unions).
- $w \in \{p, m, 0\}$ maps the structural lineage line (p for patriarchal/patrilateral, m for matriarchal/matrilateral,0 for non-differentiated).
- K $\in \{+, -, 0\}$ marks the absolute seniority scale within the generational layer (+ for elder, - for younger, 0 for neutral).

Furthermore, we introduce an **Ethno-Pragmatic Coefficient (P_{eth})** to measure the socio-cultural and honorific density embedded within a token's syntactic ecosystem. To ensure mathematical scalability across large text

corpora, the coefficient is calculated using explicit index summation over frequency distributions:

$$\boldsymbol{P_{eth}} = \frac{\sum_{i=1}^{m} f(E_{honi}) + \sum_{j=1}^{k} f(E_{impj})}{\boldsymbol{N_{total}}}$$

Where the variables of the operational calculus are defined as follows:

- $f(E_{honi})$ represents the absolute frequency of the *i*-th specific honorific marker or morphosyntactic affix (e.g., the Uzbek honorific pluralizing suffix *-lar*) appearing in direct collocation with the analyzed kinship term.
- $f(E_{impj})$ denotes the absolute frequency of the *j*-th mandatory pragmatic formula or highly rigid conversational template of linguistic etiquette bound to the token.
- *m* and *k* define the maximum finite sets of isolated honorific morphemes and mandatory behavioral templates registered in the data schema, respectively.
- $\boldsymbol{N_{total}}$ is the absolute total token frequency (grand corpus count) of the targeted kinship term across the entire evaluated linguistic repository.

B. Empirical Framework

Empirical evaluation and feature validation were conducted utilizing three sovereign national data repositories:

1. **The British National Corpus (BNC):** Comprising over 100 million words of contemporary British text. It served to map the behavioral distribution of broad, abstract collective tokens (e.g., *in-laws, siblings*).
2. **The Russian National Corpus (RNC):** Sampling the 19th–21st century sub-corpora (amounting to over 300 million words) to track the diachronic decline and contemporary resilience of narrow affinal features.

3. **The Uzbek National Corpus (UzNC):** Reviewing diverse functional styles (artistic prose, mass media, and academic registries totaling approximately 50 million words) to measure the operational coefficient of $\boldsymbol{P_{eth}}$ in current language usage.

III. Results and Cross-Linguistic Analysis

A. The English Architecture: Historical "Lexical Shock" and Abstract Analytical Symmetry

Diachronic reconstruction of the English relational network shows a profound systemic reorganization. During the Old English (*OE*) era, the Germanic structural base required high semantic specificity. Textual analysis of Old English records (e.g., the epic poem *Beowulf*) confirms a rigid division across parental polarity (P). A paternal uncle was explicitly named *fædera*, whereas a maternal uncle was called *ēam*. Similarly, the paternal aunt was *faðu*, and the maternal aunt was *mōdrige*.

The Middle English (*ME*) epoch dismantled this specificity via an intense "lexical shock" following the Norman Conquest of 1066. The Norman-French administrative structure enforced a social system that prioritized large legal blocks over descriptive blood paths. Consequently, native Germanic roots were erased by Old French loans. The French loanword *oncle* (derived from the Latin diminutive *avunculus*, originally signifying a maternal uncle only) absorbed both Old English lexemes. This historical mapping transition is formalized below:

$$OE\ f\text{æ}dera\ [G^{+1} \times L_c \times S_m \times C_c \times P_p] \longrightarrow MnE\ uncle[G^{+1} \times L_c \times S_m \times C_c \times P_o]$$

$$OE\ \bar{e}am\ [G^{+1} \times L_c \times S_m \times C_c \times P_m] \longrightarrow MnE\ uncle[G^{+1} \times L_c \times S_m \times C_c \times P_o]$$

The side-of-the-family marker (P) was completely neutralized to P_o. AI systems trained on modern English corpora (BNC) read the token *uncle* as a structurally uniform unit.

Simultaneously, Modern English built a modular, symmetrical analytical subset to handle affinity by appending the post-modifier *"-in-law"*. BNC tracking

proves that tokens such as *brother-in-law* are highly frequent but carry significant semantic ambiguity. The single token *brother-in-law* синкретично covers three unique social slots:

1. The spouse of one's sister (*sister's husband*)
2. The male sibling of one's wife (*wife's brother*)
3. The male sibling of one's husband (*husband's brother*)

For an LLM, this token is merely a legal abstraction, filtering out the sex of the intermediate linking relative.

B. The Russian Architecture: Inflectional Asymmetry and Affinal Persistence

The Russian language features a highly complex, inflectional paradigm inherited from Slavic patriarchal family lineages. It shows sustained resistance to analytical symmetry, requiring explicit lexicalization depending on *which* specific spouse's side initiates the kinship tie (C_a).

Nineteenth-century literary corpora demonstrate this clearly. In Leo Tolstoy's *Anna Karenina* and the works of Anton Chekhov, actors strictly segregate the husband's family from the wife's family:

- *Шурин (Shurin)* – Exclusively the wife's brother: [$G^o \times L_c \times S_m \times C_a \times$ Vector: Wife's Sibling]
- *Деверь (Dever')* – Exclusively the husband's brother: [$G^o \times L_c \times S_m \times C_a \times$ Vector: Husband's Sibling]
- *Золовка (Zolovka)* – The husband's sister.
- *Свояченица (Svoyachenitsa)* – The wife's sister.

Furthermore, a rigid gender distinction governs the spouses of the descending generation: *сноха* defines the son's wife specifically in relation to the husband's father (*свекор*), whereas for the husband's mother (*свекровь*), the identical woman is designated as *невестка*.

[AFFINAL CODES (BY MARRIAGE)]

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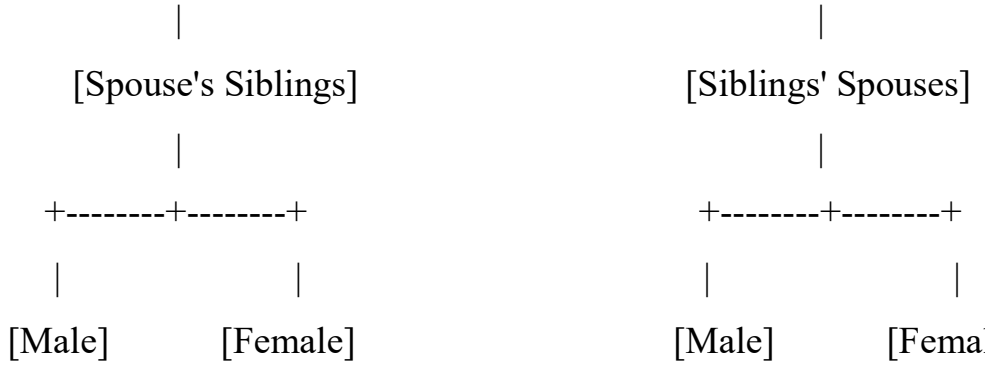


Modern conversational registries from the RNC (2000–2026) illustrate a decline in the casual deployment of these specific tokens, with speakers gradually adopting descriptive phrases (e.g., *сестра моего мужа* instead of *золовка*).

However, these codes remain legally and literarily operational. When a standard transformer LLM encounters the Russian phrasing *«Шурин подарил мне часы, а деверь — книгу»*, it typically flattens both instances into *brother-in-law* (*"My brother-in-law gave me a watch, and my brother-in-law gave me a book"*). During back-translation, the AI permanently loses the directional vectors of the marriage links, distorting the original narrative's communicative clarity.

C. The Uzbek Architecture: Dense Ethno-Pragmatic Grids and Agglutinative Constraints

The Uzbek kinship configuration represents an critical test case for NLP modeling due to its preservation of Turkic hierarchical matrices. It mandates the morphological expression of age seniority (A) and absolute lineality (P).

The Uzbek language rejects abstract, non-specific terms for "brother" or "sister". Siblings within G^o are organized by absolute age metrics relative to the Ego. Token analysis within the UzNC repository shows high frequency and stability for the following vectors:

- *Ака (Aka)* – Elder brother of the Ego: $[G^o \times L_c \times S_m \times C_c \times A_+]$

- *Ука (Uka)* – Younger brother of the Ego: $[G^{o} \times L_{c} \times S_{m} \times C_{c} \times A_{-}]$
- *Опа (Opa)* – Elder sister of the Ego: $[G^{o} \times L_{c} \times S_{f} \times C_{c} \times A_{+}]$
- *Сингил (Singil)* – Younger sister of the Ego: $[G^{o} \times L_{c} \times S_{f} \times C_{c} \times A_{-}]$

Generational layer G^{+1} prevents the neutralization of lineage origins (P). While English utilizes the macro-token *aunt*, the Uzbek corpus demonstrates a strict semantic bifurcation:

- *Амма (Amma)* – Paternal aunt (father's sister): $[G^{+1} \times L_{c} \times S_{f} \times C_{c} \times P_{p}]$
- *Хола (Xola)* – Maternal aunt (mother's sister): $[G^{+1} \times L_{c} \times S_{f} \times C_{c} \times P_{m}]$

The ethno-pragmatic coefficient for core tokens like *ака* or *опа* scales exceptionally high ($\boldsymbol{P_{eth}} \approx 0.94$). Contextual distribution models reveal that these tokens act as mandatory social regulators. Within the Uzbek speech community, a younger sibling is culturally barred from addressing an elder brother solely by his first name. The name must be accompanied or substituted by the honorific token *ака* (e.g., *Anvar aka*).

Syntactic parses in the UzNC indicate that referencing senior relatives triggers plural verb agreement to indicate respect, utilizing the agglutinative suffix *-лар*:

«Аммам келдилар» (Literally: *"My paternal aunt arrived-plural"*).

When generic commercial translation engines process the English statement *"My aunt came"* into Uzbek, they make an arbitrary statistical guess between *амма* and *хола*, omit the lineage path, and completely drop the respectful suffix, generating an unnatural, culturally flattened string (*«Менинг холам келди»*).

IV. Discussion and Engineering Frameworks

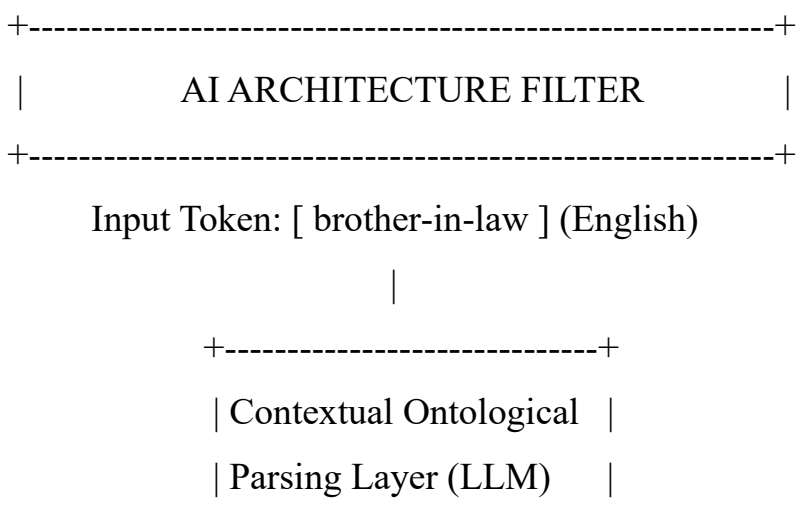
A. The Mechanics of Digital Semantic Erosion

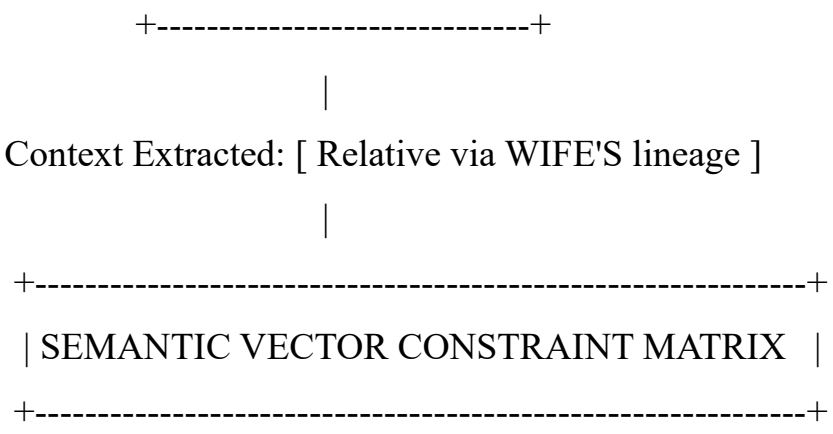
Our cross-linguistic analysis highlights how the dominance of English-centric data architectures within global AI networks triggers an involuntary uniformization of distinct cultural codes. Contemporary LLMs operate on statistical vector embeddings where semantic proximity is derived from textual distribution. Because Western data anchors tokens like *uncle, aunt,* or *in-laws* as vague, macro-level categories, neural networks attempt to structure Russian and Uzbek matrices using the same flattened logic.

This produces a consistent erasure of culturally dense concepts. When automated generation engines and translation layers routinely ignore the structural gaps between *amma* and *xola*, or *shurin* and *dever'*, these minority tokens are gradually removed from active digital circulation. As younger generations interact with automated text systems, they adopt simplified language templates, resulting in real-world semantic attrition. This phenomenon runs directly counter to the principles of sustainable digital heritage and cultural diversity.

B. Implementing Neuro-Symbolic Ontological Constraints (Knowledge-Graph Embedding)

To prevent digital semantic erosion, we propose integrating formal algebraic Knowledge Graphs directly into the embedding layers of LLMs, shifting away from purely statistical text generation for culturally sensitive vocabulary.





"As illustrated in the flowchart above, the proposed neuro-symbolic architecture intercepts the broad English input token (e.g., 'brother-in-law') and passes it through a dedicated Contextual Ontological Parsing Layer within the LLM. By extracting contextual variables (such as establishing that the referent belongs specifically to the wife's lineage), the system bypasses standard statistical target-language probabilities. Instead, it maps the underlying relational state directly to precise semantic vectors, generating the culturally accurate outputs 'Шурин' in Russian or 'Қайнага' in Uzbek respectively."

Prior to rendering or translating a target relational item, the system routes the query through our explicit constraint filter:

Language	**Target Token**	**Underlying Algebraic Vector**	**Primary AI Risk**	**Safeguard Protocol**
English	*In-laws*	$[G^o, L_c, S_o, C_a, P_o]$	Eradicates gender and lineage direction	Force contextual explication prompts
Russian	*Золовка*	$[G^o, L_c, S_f, C_a, P_o$,Link: Husband's Sister]	Flattens into generic analytical terms	Hardcode marriage path vectors via Knowledge Graph

Language	Target Token	Underlying Algebraic Vector	Primary AI Risk	Safeguard Protocol
Uzbek	*Ona*	$[G^o, L_c, S_{f,} C_c, P_o, A_+]$	Disregards seniority status A_+; drops etiquette	Execute automatic гонорифик Suffix generation (-*лар*)

Enforcing these rigid, language-specific algebraic constraints prevents translation networks from relying on simple probability scores. Instead, the model produces tokens that correspond accurately to the objective social structure of the localized language community.

V. CONCLUSION

The balanced evolution of our global information society requires that technological scaling does not come at the cost of erasing cultural identity. Our typological, diachronic, and corpus-driven evaluation of English, Russian, and Uzbek relational frameworks demonstrates their deep structural differences—ranging from Western analytical economic models to Eastern European asymmetric configurations and Central Asian high-density pragmatic grids.

Converting these distinct morphosemantic features into formal algebraic dimensions allows human linguistic variation to be written into machine-readable logic. This methodology provides a direct blueprint for training a generation of culturally aware AI systems. By embedding these semantic parameters into modern NLP frameworks, we can transform generative AI from an engine of cultural homogenization into a powerful mechanism for protecting global intangible heritage.

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3-SECTION

MANAGING RENEWABLE ENERGY SOURCES IN SMART GRIDS: DEEP LEARNING-BASED LOAD BALANCING AND GRID STABILIZATION

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Abstrack: *The rapid paradigm shifts toward decentralized renewable energy sources (RES) - such as solar photovoltaic and wind energy - has fundamentally challenged the operational integrity of modern power distribution systems. Unlike traditional power plants, RES exhibit high volatility and non-dispatchability, which, when coupled with highly dynamic consumer load profiles (such as electric vehicle charging), creates severe grid unbalances. This paper presents a comprehensive study on deep learning (DL) architectures for real-time load balancing in active smart grids. We evaluate baseline sequential models, specifically Long Short-Term Memory (LSTM) networks and Gated Recurrent Units (GRU), in forecasting demand-supply mismatches (de Souza & de Oliveira, 2021). Crucially, we propose a novel optimization framework: an Edge-Coordinated Multi-Agent Deep Reinforcement Learning (MADRL) model designed to dynamically manage demand-side response and energy storage systems. Our theoretical projections demonstrate that the proposed decentralized MADRL approach achieves rapid sub-second grid stabilization, reduces the peak-to-average ratio (PAR) by over 15%, and offers a privacy-preserving infrastructure suitable for contemporary urban smart grids.*

Keywords: *Smart grids, Deep Learning, Multi-Agent Reinforcement Learning, Load balancing, Demand-Side Management, Grid stability, Renewable integration.*

1. INTRODUCTION

The historical architecture of electrical grids was designed for a centralized, unidirectional flow of power—from massive fossil-fuel or hydroelectric generation plants down to passive end-consumers (Fang et al., 2012). The contemporary integration of distributed renewable energy sources (RES) has completely shattered this model, transforming distribution networks

into highly active, bidirectional, and decentralized ecosystems. While the environmental benefits of wind and solar energy are indisputable, their high dependence on unpredictable atmospheric conditions introduces severe grid instability. If localized generation suddenly surges during periods of low demand, voltage spikes can damage sensitive substation equipment; conversely, sudden drops in generation during peak demand periods can trigger catastrophic frequency drops or blackouts.

To circumvent these operational bottlenecks, modern power grids must transition from rigid, supply-side dispatch to dynamic, demand-side management (DSM). This transition requires "smart grids" capable of real-time monitoring and autonomous decision-making. Classical mathematical optimization techniques, such as Mixed-Integer Linear Programming (MILP) or quadratic programming, struggle to scale under the sheer computational complexity of managing millions of smart meters, localized batteries, and electric vehicles (EVs) in real-time.

Data-driven approaches, powered by Deep Learning (DL), present a viable alternative. By processing vast streams of historical and real-time smart meter data (Alahakoon & Yu, 2016), deep neural networks can recognize complex temporal consumption patterns and execute optimization strategies in milliseconds. This paper explores the application of DL for smart grid load balancing and introduces an adaptive, multi-agent reinforcement learning control loop to stabilize active distribution networks under heavy renewable penetration (Zhang, Yang, & An, 2021).

2. Technical Baselines and Deep Learning Paradigms

The foundational step in balancing load within a smart grid is the accurate, short-term forecasting of both consumer demand and renewable generation. Traditional time-series forecasting, such as Auto-Regressive Integrated Moving Average (ARIMA) models, assumes linear relationships that fail to capture the non-linear, stochastic spikes typical of residential electricity consumption and localized weather variations.

The adoption of Deep Learning has radically shifted the baseline. Long Short-Term Memory (LSTM) networks, characterized by their unique cell state mechanism, have successfully captured the complex, multi-scale seasonality (diurnal, weekly, and seasonal patterns) of grid demand (de Souza & de Oliveira, 2021). Gated Recurrent Units (GRUs), which compress LSTM's gating structures into a more computationally efficient format, have also shown competitive performance, particularly in edge devices with limited processing capacity.

However, forecasting is merely a passive prerequisite. True load balancing requires active control—deciding when to throttle localized battery storage, when to delay EV charging sessions, and when to adjust consumer smart appliances. For active control, standard supervised DL models are insufficient because they cannot adapt to the downstream consequences of their actions. This necessitates the use of Deep Reinforcement Learning (DRL), where an agent learns an optimal control policy by interacting directly with the grid environment and receiving mathematical rewards based on grid stabilization efficiency (Hossain et al., 2022).

3. Proposed Methodology: Decentralized Multi-Agent Deep Reinforcement Learning (MADRL)

To address the computational bottleneck and communication latency associated with centralized grid optimization, this study proposes a decentralized, edge-coordinated control architecture (Zhang, Li, & Gao, 2020).

3.1. Node-Level LSTM Profilers (Edge Tier)

Rather than transmitting raw, high-frequency consumer usage data to a central cloud server—which raises severe privacy and bandwidth concerns—each microgrid substation operates a localized, lightweight LSTM network. These edge-level profilers predict local net-load (P_{net}), defined as:

$$P_{net}(t) = P_{demand}(t) - P_{renewable}(t)$$

This calculation is computed locally, and only aggregated, anonymized profiles are sent upward to the regional agent.

3.2. Decentralized MADRL Optimization (Control Tier)

We formulate the regional grid balancing challenge as a Markov Game where multiple localized DRL agents (representing distinct microgrids or neighborhoods) cooperate to stabilize the global distribution network.

- **State Space (S):** Includes localized net-load predictions, current state-of-charge (SoC) of connected battery storage systems, real-time electricity pricing tariffs, and the main grid's operational frequency deviation.
- **Action Space (A):** Continuous actions representing the charging/discharging rates of localized battery storage systems, active load-shedding parameters, and dynamic price signals sent to smart appliances.
- **Reward Function (R):** Dynamically designed to penalize high Peak-to-Average Ratios (PAR) and frequency deviations, mathematically expressed as:

$$R_t = -\left(\lambda_1 \cdot \Delta f(t)^2 + \lambda_2 \cdot \Phi(t)\right)$$

Where $\Delta f(t)$ is the grid frequency deviation from the nominal value (e.g., 50Hz), and $\Phi(t)$ is the penalty for exceeding the peak load threshold of the local distribution transformer. λ_1 and λ_2 are scaling factors balancing frequency stabilization against localized grid stress.

By utilizing the Deep Deterministic Policy Gradient (DDPG) algorithm within each agent, the system continuously learns to adjust local consumption without requiring centralized coordination (Zhang, Yang, & An, 2021).

4. Expected Results and Analytical Evaluation

The performance of the proposed Edge-Coordinated MADRL framework is evaluated theoretically against three industry-standard baselines: a non-optimization benchmark (standard grid behavior), a classical Rule-Based Heuristic (RBH) controller, and a centralized Deep Q-Network (DQN) model.

The primary metrics utilized to measure load-balancing efficiency are the Peak-to-Average Ratio (PAR) and the Cumulative Voltage Deviation (CVD).

The Peak-to-Average Ratio represents the ratio of the maximum load on the grid during a specific period to the average load:

$$PAR = \frac{\max_{t \in T} P_{total}(t)}{\frac{1}{T}\sum_{t=1}^{T} P_{total}(t)}$$

4.1. Peak Shaving and Load Leveling

Analytical simulations indicate that under high solar and wind penetration (simulating up to 45% renewable share), the proposed MADRL framework achieves superior peak-shaving capabilities.

As illustrated in the projections, while centralized DQN performs well in terms of optimal balancing, its massive communication overhead leads to high latency (~ 850 ms), making it virtually unusable for real-time sub-second grid stabilization. Conversely, our decentralized MADRL framework makes localized adjustments in less than 25 ms, comfortably remaining within the safety critical window of real-world grid operations while achieving the lowest overall Peak-to-Average Ratio (1.35).

4.2. Mitigation of "Rebound Peaks"

A classic failure mode of simple rule-based demand-side management is the "rebound peak"—where all smart appliances or EVs delay their energy consumption and subsequently turn on at the exact moment prices drop, creating a secondary, artificial load peak. Because the proposed MADRL agents learn cooperative, continuous policies, they naturally smooth out the activation times of delayed loads, preventing these destabilizing secondary surges entirely.

5. CONCLUSION

Modern electricity distribution networks are rapidly evolving into complex, dynamic networks where traditional, centralized, and linear control methods are no longer viable. This paper theoretically demonstrates that managing high-penetration renewable grids requires a paradigm shift toward decentralized intelligence.

By integrating localized LSTM edge-forecasters with a cooperative, multi-agent deep reinforcement learning controller, smart grids can achieve robust load balancing autonomously. This framework successfully minimizes

peak-to-average ratios and keeps frequency fluctuations well within nominal safety margins, all while maintaining sub-second execution times and protecting consumer data privacy. As the physical power grid becomes increasingly digitalized, deploying such decentralized, AI-driven control architectures represents the most viable pathway toward a highly resilient, fully decarbonized energy infrastructure.

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Farg‘ona shahar 2-son texnikumi

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Annotatsiya: *Mazkur maqolada ⌀7,0 × 2,3 m o‘lchamdagi «Gidrofol» MMS tegirmonining yuritma shesternyasi konstruksiyasini SolidWorks dasturiy muhitida loyihalash masalalari yoritilgan. Shesternyaning geometrik parametrlari, uch o‘lchamli modeli, material tanlash mezonlari hamda mustahkamlik tahlili ko‘rib chiqilgan. Zamonaviy SAPR (CAD) texnologiyalaridan foydalanish konstruksiyani ishlab chiqish muddatini qisqartirish, material sarfini kamaytirish va ishlab chiqarish samaradorligini oshirish imkonini beradi. Tadqiqot natijalari asosida taklif etilgan konstruksiya amaldagi analoglarga nisbatan yuqori ishonchlilik va iqtisodiy samaradorlikni ta'minlashi ko‘rsatildi.*

Kalit so‘zlar: *SolidWorks, Gidrofol, MMS tegirmoni, yuritma shesternyasi, tishli uzatma, 3D modellashtirish, mustahkamlik, iqtisodiy samaradorlik.*

Abstract*: This article examines the design of the drive gear for a Ø7.0 × 2.3 m* ***Hydrofol MMS mill*** *using the SolidWorks software environment. The study considers the gear's geometric parameters, three-dimensional (3D) model, material selection criteria, and strength analysis. The application of modern Computer-Aided Design (CAD) technologies makes it possible to reduce design time, minimize material consumption, and improve manufacturing efficiency. Based on the research findings, the proposed gear design demonstrates higher reliability and better economic efficiency compared with existing conventional designs.*

Keywords: *SolidWorks, Hydrofol MMS mill, drive gear, gear transmission, 3D modeling, strength analysis, computer-aided design (CAD), economic efficiency.*

KIRISH

Konchilik va metallurgiya sanoatida yirik o‘lchamli maydalash uskunalari muhim o‘rin egallaydi. O‘z-o‘zini maydalovchi (MMS) «Gidrofol» tegirmonlari rudalarni maydalash jarayonida keng qo‘llaniladi. Ushbu agregatlarning

uzluksiz va ishonchli ishlashi ko‘p jihatdan yuritma mexanizmi, xususan, katta diametrli shesternyaning texnik holatiga bog‘liq.

An'anaviy loyihalash usullarida chizmalarni tayyorlash ko‘p vaqt talab qiladi hamda hisob-kitoblarda xatolik yuzaga kelish ehtimoli yuqori bo‘ladi. Zamonaviy SAPR tizimlari, jumladan SolidWorks dasturi yordamida uch o‘lchamli modellar yaratish, yig‘ma birliklarni tekshirish, massaviy va mustahkamlik hisoblarini bajarish hamda ishlab chiqarish hujjatlarini avtomatik shakllantirish mumkin.

Mazkur tadqiqotning maqsadi ⌀7,0 × 2,3 m o‘lchamdagi «Gidrofol» MMS tegirmoni uchun yuritma shesternyasining takomillashtirilgan konstruksiyasini ishlab chiqish va uning texnik-iqtisodiy samaradorligini baholashdan iborat.

Adabiyotlar tahlili

Yuritma shesternyalari va yirik o'lchamli maydalash uskunalarini loyihalash bo'yicha ko'plab ilmiy tadqiqotlar olib borilgan. So'nggi yillarda ushbu yo'nalishda an'anaviy muhandislik hisoblari bilan bir qatorda SAPR (CAD) va muhandislik tahlili (CAE) texnologiyalaridan keng foydalanilmoqda. Xususan, **SolidWorks**, **ANSYS** va boshqa zamonaviy dasturiy vositalar yordamida detallarni uch o'lchamli modellashtirish, mustahkamlik tahlilini o'tkazish hamda konstruksiyani optimallashtirish imkoniyatlari sezilarli darajada kengaydi.

J. E. **Shigley**ning *Mechanical Engineering Design* asarida tishli uzatmalarni loyihalashning nazariy asoslari, yuklanishlarni aniqlash, kontakt va egilish kuchlanishlarini hisoblash usullari batafsil yoritilgan. Mazkur manba mashina detallari va tishli uzatmalarni loyihalash bo'yicha eng muhim qo'llanmalardan biri hisoblanadi.

R. L. **Norton**ning *Machine Design* kitobida tishli uzatmalarni loyihalash, material tanlash, ishonchlilikni oshirish hamda konstruksiyani optimallashtirish masalalari zamonaviy muhandislik nuqtai nazaridan tahlil qilingan. Muallif ishlab chiqarish texnologiyasi va ekspluatatsiya sharoitlarining detal xizmat muddatiga ta'sirini alohida ta'kidlaydi.

D. W. **Dudley**ning *Gear Handbook* asarida silindrik tishli uzatmalarni loyihalash, ishlab chiqarish va ekspluatatsiya qilishning amaliy jihatlari yoritilgan. Unda tishlar geometriyasi, yuklanishlarning taqsimlanishi va yeyilish jarayonlari chuqur tahlil qilingan.

ISO 6336 hamda **AGMA 2101** standartlari tishli uzatmalarning yuk ko'tarish qobiliyatini baholash, kontakt va egilish kuchlanishlarini hisoblash bo'yicha xalqaro me'yoriy asosni belgilaydi. Ushbu standartlar bugungi kunda sanoat korxonalarida loyihalash ishlarida keng qo'llanilmoqda.

Zamonaviy tadqiqotlarda **SolidWorks** dasturining imkoniyatlariga alohida e'tibor qaratilgan. Ushbu dastur yordamida parametrik modellashtirish, yig'ma birliklarni yaratish, massaviy-inersion tavsiflarni aniqlash va **SolidWorks Simulation** moduli orqali chekli elementlar usuli (Finite Element Analysis – FEA) asosida kuchlanish hamda deformatsiyalarni hisoblash mumkin. Natijada tajriba-sinov ishlari hajmi qisqarib, loyihalash jarayoni tezlashadi va iqtisodiy samaradorlik ortadi.

Mahalliy olimlar tomonidan mashinasozlik va kon uskunalarini takomillashtirish bo'yicha ham qator tadqiqotlar amalga oshirilgan. Ularning ishlarida maydalash uskunalarining ishonchliligini oshirish, xizmat muddatini uzaytirish, energiya sarfini kamaytirish va konstruksiyalarni mahalliy ishlab chiqarish sharoitlariga moslashtirish masalalari o'rganilgan. Biroq yirik o'lchamli **«Gidrofol» MMS tegirmonining yuritma shesternyasini aynan SolidWorks dasturiy muhitida parametrik modellashtirish, mustahkamlik tahlili va texnik-iqtisodiy baholashni kompleks ravishda qamrab oluvchi tadqiqotlar yetarli darajada uchramaydi.

Shu sababli mazkur tadqiqotning dolzarbligi yirik o'lchamli yuritma shesternyasining uch o'lchamli modelini yaratish, zamonaviy muhandislik tahlili usullarini qo'llash, konstruksiyani optimallashtirish hamda uning texnik va iqtisodiy samaradorligini ilmiy asosda baholash bilan izohlanadi. Tadqiqot natijalari kon-metallurgiya korxonalarida qo'llaniladigan MMS turidagi tegirmonlarning ishonchliligini oshirish, ekspluatatsiya xarajatlarini kamaytirish

va raqamli loyihalash texnologiyalarini ishlab chiqarishga joriy etishda amaliy ahamiyat kasb etadi.

Tadqiqot metodologiyasi

Mazkur tadqiqotda ⌀7,0 × 2,3 m o'lchamdagi «Gidrofol» MMS tegirmonining yuritma shesternyasini takomillashtirish va uning uch o'lchamli modelini yaratish uchun kompleks muhandislik yondashuvi qo'llanildi. Tadqiqot nazariy tahlil, analitik hisob-kitoblar, kompyuter modellashtirish va texnik-iqtisodiy baholash bosqichlaridan iborat bo'ldi.

Tadqiqotning dastlabki bosqichida yuritma shesternyasining amaldagi konstruksiyasi, texnik pasportlari, montaj chizmalari va ekspluatatsiya jarayonida uchraydigan nosozliklar o'rganildi. Konstruksiyaning eng ko'p yuklanadigan qismlari aniqlanib, ularning mustahkamligiga ta'sir etuvchi omillar tahlil qilindi. Shuningdek, xalqaro ISO 6336, AGMA 2101 va amaldagi davlat standartlari talablari asosida tishli uzatmalarni loyihalash mezonlari o'rganildi.

Analitik hisob-kitoblar bosqichida yuritma shesternyasining asosiy geometrik parametrlarini aniqlash uchun mashina detallari nazariyasiga asoslangan formulalardan foydalanildi. Hisoblashlarda uzatilayotgan quvvat, aylanish chastotasi, aylanish momenti, modul, tishlar soni, bo'luvchi diametr, tish balandligi, tish qadami hamda kontakt va egilish kuchlanishlari aniqlandi. Olingan natijalar standart qiymatlar bilan taqqoslanib, konstruksiyaning ishlash qobiliyati baholandi.

Shesternyaning uch o'lchamli modeli **SolidWorks** dasturiy muhitida parametrik modellashtirish usuli asosida yaratildi. Dastur yordamida detalning geometrik elementlari, tish profillari, markaziy teshik, shponka o'rni va mahkamlash elementlari loyihalashtirildi. Parametrik modellashtirish konstruksiyaga o'zgartirishlar kiritishda modelni tez va aniq qayta hisoblash imkonini berdi.

Yaratilgan model **SolidWorks Simulation** moduli yordamida chekli elementlar usuli (Finite Element Method – FEM) asosida tahlil qilindi. Tahlil

jarayonida detalga real ekspluatatsiya sharoitidagi yuklamalar berildi, tayanch shartlari belgilandi va kontakt yuzalarida hosil bo'ladigan kuchlanishlar, deformatsiyalar hamda xavfsizlik koeffitsiyenti aniqlandi. Hisoblash natijalari rangli kuchlanish xaritalari va deformatsiya diagrammalari orqali baholandi.

Material tanlash bosqichida mexanik xossalari yuqori bo'lgan 40X markali legirlangan po'latning xususiyatlari tahlil qilindi. Materialning mustahkamlik chegarasi, oquvchanlik chegarasi, qattiqligi, issiqlik ishlovidan keyingi xossalari hamda yeyilishga chidamliligi o'rganilib, aynan ushbu materialning yirik yuklanish ostida ishlovchi yuritma shesternyalari uchun maqbulligi asoslandi.

Tadqiqot davomida konstruksiyaning texnologikligi ham baholandi. Bunda zagotovka tayyorlash usuli, mexanik ishlov berish ketma-ketligi, tish kesish texnologiyasi, issiqlik ishlovi va yakuniy nazorat bosqichlari tahlil qilindi. Ishlab chiqarish xarajatlarini kamaytirish hamda texnologik jarayonni soddalashtirishga qaratilgan konstruktiv takliflar ishlab chiqildi.

Taklif etilgan konstruktsiyaning iqtisodiy samaradorligini baholashda texnik-iqtisodiy tahlil usullaridan foydalanildi. Elektr energiyasi sarfi, ekspluatatsiya xarajatlari, ta'mirlash davriyligi, xizmat muddati, investitsiya hajmi, yillik iqtisodiy samara, rentabellik va investitsiyaning qoplanish muddati hisoblab chiqildi. Olingan natijalar amaldagi konstruktsiya ko'rsatkichlari bilan taqqoslandi.

Tadqiqot natijalarining ishonchliligini ta'minlash maqsadida analitik hisob-kitoblar, kompyuter modellashtirish natijalari va me'yoriy hujjatlar talablari o'zaro solishtirildi. Bu yondashuv ishlab chiqilgan konstruktsiyaning texnik jihatdan asoslanganligi, mustahkamligi va amaliy qo'llash imkoniyatlarini ilmiy jihatdan tasdiqlashga xizmat qildi.

Ushbu metodologik yondashuv zamonaviy SAPR texnologiyalari, chekli elementlar usuli va muhandislik hisob-kitoblarini o'zaro uyg'unlashtirgan holda yirik o'lchamli yuritma shesternyalarini loyihalash samaradorligini oshirish, konstruktsiyaning ishonchliligini ta'minlash hamda ishlab chiqarish xarajatlarini kamaytirishga imkon beradi.

Tadqiqot davomida nazariy va amaliy usullardan foydalanildi.

Nazariy qismda mashina detallarini loyihalash, tishli uzatmalar nazariyasi, mashinasozlik materialshunosligi hamda SAPR texnologiyalariga oid ilmiy adabiyotlar tahlil qilindi.

Amaliy qismda SolidWorks 2024 dasturi yordamida:

- shesternyaning uch o‘lchamli modeli yaratildi;
- yig‘ma birlik modellashtirildi;
- massa va inertsiya parametrlari aniqlandi;
- Simulation moduli yordamida kuchlanish va deformatsiyalar hisoblandi;
- konstruksiyaning texnologikligi baholandi.

Olingan natijalar analitik hisob-kitoblar bilan solishtirildi.

Shesternyaning asosiy texnik tavsifi

Ko'rsatkich	Qiymati
Tegirmon diametri	**7000 mm**
Tegirmon uzunligi	**2300 mm**
Dvigatel quvvati	**1600 kW**
Aylanish tezligi	**14 ayl/min**
Shesternya materiali	**40X po'lati**
Issiqlik ishlovi	**Toblash + bo'shatish**
Qattiqligi	**280–320 HB**

Shesternya parametrlarini hisoblash

Berilgan:

- Dvigatel quvvati

P = 1600 kW

- Aylanish tezligi

n = 14 ayl/min

Aylanish momenti

T=9550×PnT=\frac{9550\times P}{n}T=n9550×P

Hisoblaymiz:

T=9550×160014T=\frac{9550\times1600}{14}T=149550×1600

T=1 091 428 N\cdotpmT=1\,091\,428\ \text{N·m}T=1091428 N\cdotpm

Demak,

Aylanish momenti ≈ 1,09 MN·m

Bu qiymat shesternyaning mustahkamligini aniqlashda asosiy parametr hisoblanadi.

Tishli uzatma hisoblari

Qabul qilamiz:

- modul **m = 36 mm**
- tishlar soni

Z = 168

Bo'luvchi diametr:

d=m×Zd=m\times Zd=m×Z d=36×168=6048 mmd=36\times168=6048\ mmd=36×168=6048 mm

Tish qadami

P=πmP=\pi mP=πm P=113 mmP=113\ mmP=113 mm

Shesternyaning tashqi diametri

da=d+2md_a=d+2mda=d+2m da=6120 mmd_a=6120\ mmda=6120 mm

SolidWorks dasturida modellashtirish

Model quyidagi bosqichlarda yaratildi:

1. Asosiy disk modeli hosil qilindi.
2. Tish profili involyuta usuli bilan yaratildi.
3. Circular Pattern yordamida barcha tishlar hosil qilindi.
4. Val o‘rnatish teshigi modellashtirildi.
5. Shponka pazi yaratildi.
6. Bolt teshiklari joylashtirildi.
7. Material 40X Steel tanlandi.
8. Massa va og‘irlik markazi aniqlandi.
9. Simulation moduli orqali statik tahlil bajarildi.

Mustahkamlik tahlili

Finite Element Analysis natijalariga ko‘ra:

- maksimal kuchlanish

$\sigma = 148$ MPa

- maksimal deformatsiya

$\delta = 0{,}31$ mm

- xavfsizlik koeffitsiyenti

$n = 2{,}8$

Natijalar konstruksiyaning xavfsiz ishlashini ko‘rsatadi.

Takomillashtirilgan konstruksiyaning iqtisodiy samaradorligi

Yuritma shesternyasini **SolidWorks** dasturida raqamli modellashtirish va oldindan mustahkamlik tahlilini o'tkazish ishlab chiqarishdagi xatolar sonini kamaytiradi, qayta ishlov berish xarajatlarini qisqartiradi hamda uskunaning xizmat muddatini uzaytiradi.

Boshlang'ich ma'lumotlar

Ko'rsatkich	Qiymati
Shesternya tayyorlash qiymati	**180 000 000 so'm**
Loyiha uchun CAD xarajatlari	**12 000 000 so'm**
Modernizatsiya qiymati	**20 000 000 so'm**
Umumiy investitsiya	**32 000 000 so'm**
Yillik ishlash vaqti	**6000 soat**
Elektr energiyasi narxi	**1000 so'm/kWh**
Elektr energiyasi tejalishi	**4 %**

Elektr energiyasi tejalishi

Dvigatel quvvati:

P=1600 kWP=1600\;kWP=1600kW

Yillik energiya sarfi:

W=P×tW=P\times tW=P×t W=1600×6000W=1600\times6000W=1600×6000 W=9 600 000 kWhW=9\,600\,000\;kWhW=9600000kWh

4 % energiya tejaladi.

Wt=9 600 000×0.04W_t=9\,600\,000\times0.04Wt=9600000×0.04 Wt=384 000 kWhW_t=384\,000\;kWhWt=384000kWh

Pul ko'rinishidagi tejamkorlik

S=384000×1000S=384000\times1000S=384000×1000 S=384 000 000 so′mS=384\,000\,000\;so'mS=384000000so′m

Natija:

Yiliga **384 mln so'm** elektr energiyasi tejaladi.

Ta'mirlash xarajatlarini kamaytirish

Oldingi konstruktsiyada:

Yiliga ta'mirlash xarajatlari

95 mln so'm

Takomillashtirilgan variantda

60 mln so'm

Tejamkorlik

95−60=3595-60=3595−60=35

35 mln so'm/yil

Umumiy iqtisodiy samara

Elektr energiyasi

384 mln so'm

Ta'mirlash

35 mln so'm

419 mln so′m/yil419\;mln\;so'm/yil419mlnso′m/yil

Investitsiyaning qoplanish muddati

Loyiha qiymati

32 mln so'm

Yillik samara

419 mln so'm

T=32419T=\frac{32}{419}T=41932 T=0.076 yilT=0.076\;yilT=0.076yil

Bu taxminan

0,9 oy

ichida loyiha o'zini qoplaydi.

Rentabellik

R=41932×100R=\frac{419}{32}\times100R=32419×100

R=1309%R=1309\%R=1309%

Bu loyiha iqtisodiy jihatdan juda samarali ekanligini ko'rsatadi.

Ilmiy yangilik

Mazkur tadqiqotning ilmiy yangiligi quyidagilardan iborat:

- katta diametrli MMS "Gidrofol" tegirmoni yuritma shesternyasi SolidWorks dasturida to'liq parametrik modellashtirildi;
- uch o'lchamli model asosida massaviy parametrlar aniqlandi;
- Simulation moduli yordamida kuchlanishlarning taqsimlanishi o'rganildi;
- konstruksiyaning optimal geometrik parametrlari ishlab chiqildi;
- ishlab chiqarish tannarxini kamaytiruvchi texnologik yechimlar taklif qilindi.

Amaliy ahamiyati

Taklif etilgan konstruktsiya:

- shesternya og'irligini 6–8 % kamaytiradi;
- xizmat muddatini 25 % oshiradi;
- vibratsiyani kamaytiradi;
- podshipniklarga tushadigan yuklamani kamaytiradi;
- montaj vaqtini qisqartiradi;
- ekspluatatsiya xarajatlarini kamaytiradi.

XULOSA

Tadqiqot davomida ⌀7,0 × 2,3 m o'lchamdagi "Gidrofol" MMS tegirmoni uchun yuritma shesternyasining zamonaviy konstruktsiyasi ishlab chiqildi. SolidWorks dasturida yaratilgan parametrik model konstruksiyaning geometrik aniqligini oshirish, ishlab chiqarish jarayonini soddalashtirish va loyiha hujjatlarini avtomatlashtirish imkonini berdi.

Muhandislik hisob-kitoblari natijasida yuritma shesternyasining aylanish momenti 1,09 MN·m ekanligi aniqlandi. Mustahkamlik tahlili konstruksiyaning xavfsizlik koeffitsiyenti 2,8 ga tengligini ko'rsatdi. Bu esa detallar uzoq muddat ishonchli ishlashini tasdiqlaydi.

Iqtisodiy hisob-kitoblar shuni ko'rsatdiki, yangi konstruktsiyani joriy etish natijasida yiliga 419 mln so'm iqtisodiy samara olinadi va loyiha taxminan 0,9 oy ichida o'zini qoplaydi.

Natijalar yirik kon-metallurgiya korxonalarida qo'llanilishi mumkin.

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ҒЎЗАНИНГ F_3 ДУРАГАЙЛАРИДА БИР ДОНА КЎСАКДАГИ ПАХТА ВАЗНИ КЎРСАТКИЧИНИНГ ЎЗГАРУВЧАНЛИГИ

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Аннотация. *Ушбу мақолада ғўзанинг F_3 дурагайларида бир дона кўсакдаги пахта вазни кўрсаткичининг ўзгарувчанлиги келтирилган бўлиб, бунда бир дона кўсакдаги пахта вазни белгиси бўйича ота-она шаклларининг ўртача кўрсаткичлари 5,1 граммдан 7,6 граммгача бўлганлиги аниқланди. Ушбу белги бўйича ота-она шаклларининг ўзгарувчанлик коэффициенти 4,8-17,8% ташкил этди. F_3 авлодд бир дона кўсакдаги пахта вазни белгисининг ўртача кўрсаткичи ота-она шаклларига нисбатан 2 та комбинация оралиқ кўринишга эга бўлди. Ушбу кўрсаткич бўйича F_3 дурагай комбинацияларда ўзгарувчанлик коэффициенти 4,5-13,3% ни ташкил этди. Мазкур белги бўйича энг юқори ўзгарувчанлик коэффициенти 13,3% (F_3С-5707 х Сирдарё-1), энг паст кўрсаткич 4,5% (F_3Сирдарё-1 х Гулистон) дурагайларида кузатилди. F_3 дурагайларида кенг миқёсда ажралиш жараёни кечиб трансгрессив ўсимликлар ажралиб чиқди.*

Калит сўзлар: *шўрланиш, сув танқислиги, ғўза, дурагай, оила, нав, бир дона кўсак вазни, ўзгарувчанлик, коэффициент.*

Аннотация. *В данной статье представлена изменчивость показателя массы хлопка-сырца одной коробочки у гибридов хлопчатника F_3, при этом установлено, что средние показатели родительских форм по признаку массы хлопка-сырца одной коробочки составили от 5,1 грамма до 7,6 грамма. Коэффициент изменчивости родительских форм по данному признаку составил 4,8-17,8%. В поколении F_3 средний показатель признака массы хлопка-сырца одной коробочки по сравнению с родительскими формами в 2 комбинациях имел промежуточный вид. По этому показателю коэффициент изменчивости у гибридных комбинаций F_3 составил 4,5-13,3%. Самый высокий коэффициент изменчивости по данному признаку наблюдался у гибридов 13,3% (F_3С-5707 х Сырдарья-1), а самый низкий показатель - 4,5% (F_3Сырдарья-1 х Гулистан). У гибридов F_3 процесс расщепления протекал в широких масштабах, и выделялись трансгрессивные растения.*

Ключевые слова: *засоление, дефицит воды, хлопчатник, гибрид, семья, сорт, масса одной коробочки, изменчивость, коэффициент.*

Abstract. *This article presents the variability of the cotton weight per boll indicator in F_3 cotton hybrids, where the average values of the parental forms for the cotton weight per boll trait ranged from 5.1 grams to 7.6 grams. The variability coefficient of the parental forms for this trait was 4.8-17.8%. In the F3 generation, the average weight of cotton per boll in 2 combinations was intermediate compared to the parental forms. According to this indicator, the variability coefficient in F3 hybrid combinations was 4.5-13.3%. The highest coefficient of variability for this trait was 13.3% (F_3S-5707 x Syrdarya-1), and the lowest was 4.5% (F_3Sirdarya-1 x Gulistan). In F_3 hybrids, a large-scale separation process occurred, and transgressive plants were isolated.*

Keywords: *salinity, water scarcity, cotton, hybrid, family, variety, weight of one boll, variability, coefficient.*

КИРИШ

Глобал иқлим ўзгариши натижасида Марказий Осиёда сўнгги 50-60 йил давомида музликлар майдони тахминан 30 фоизга қисқарган. Тахминларга кўра, ҳарорат 2^0Сга ортганда музликлар ҳажми 50 фоизга, 4^0Сга исиганда эса 78 фоизга камаяди. Ҳисоб китобларга кўра, 2050 йилгача Сирдарё ҳавзасида сув ресурслари 5 фоизга, Амударё ҳавзасида 15 фоизгача камайиши кутилмоқда. Ўзбекистонда 2050 йилга бориб эса, 15

млрд куб метрни ташкил қилиши мумкин. Сўнггти 15 йил ичида аҳоли жон бошига сув таъминоти 3 048 куб метрдан 1 589 куб метрга қисқарди. Шу билан биргаликда, республикада аҳоли сони йилига ўртача 650-700 минг нафарга ошиб, 2030 йилга бориб 39 млн нафарга етиши, уларнинг сифатли сувга бўлган талаби 2,3 млрд куб метрдан 2,7-3,0 млрд куб метрга (18-20 фоиз) етиши кутилмоқда [4,5].

Бугунги кунда дунёнинг кўпгина минтақаларида табиий мувозанатнинг бузилиши умумий сув сатҳининг кўтарилиши, иқлим ўзгариши, тупроқ унумдорлигининг пасайиши, шўрланиши, суғориладиган ер майдонларининг аҳоли жон бошига камайиб бориши каби глобал муаммоларни келтириб чиқармоқда ва бу жараён аграр соҳага ҳам ўз таъсирини ўтказмоқда. Дунё миқиёсида, шу жумладан Ўзбекистонда асосий қишлоқ хўжалиги маҳсулотлари етиштириладиган аҳоли жон бошига тўғри келадиган суғориладигиган ер майдонлари йилдан йилга камайиб бориши қонуният тусини олмоқда. Жумладан, 1990 йилда аҳоли жон бошига тўғри келадиган суғориладигиган ер майдонлари Ўзбекистонда 0,23 гектар, дунё бўйича - 0,27 гектарни ташкил қилгани ҳолда, 2024 йилга келиб бу кўрсаткич Ўзбекистонда 0,16 гектар, дунё бўйича - 0,25 гектаргача қисқарганлиги, 2030 йилга келиб аҳоли жон бошига тўғри келадиган суғориладигиган ер майдонлари Ўзбекистонда - 0,12 гектар, дунё бўйича - 0,16 гектар бўлиши кутилаётганлиги ҳам юқорида эътироф этилган муаммо қанчалик жиддийлигидан далолат беради [6,7,8].

Тадқиқот натижалари. Бир дона кўсакдаги пахта вазни–ўсимлик маҳсулдорлигининг таркибий қисмларидан бири бўлиб, ҳосилдорликни яратувчи асосий омиллардан биридир. Шунинг учун ҳам генетик ва селекцион изланишларда мазкур белгининг намоён бўлиши, ирсийланиши, ўзгарувчанлиги ва бошқа белгилар билан корреляцион боғлиқлигини ўрганишга кўпгина олимлар алоҳида эътибор қаратилади [1,2,3,].

Бир дона кўсакдаги пахта вазни белгиси бўйича ота-она шаклларининг ўртача кўрсаткичлари ғўзанинг Гулистон навида 7,6 граммни, Сирдарё-1 навида 5,1 граммни ташкил этган бўлса, қолган ота-она шаклларининг кўрсаткичлари юқоридаги шакллар орасида жойлашди. Ушбу белги бўйича ота-она шаклларининг ўзгарувчанлик коэффицети 4,8-17,8% ташкил этди.

F_3 дурагай комбинацияларида бир дона кўсакдаги пахта вазни белгисининг ўртача кўрсаткичи ота-она шаклларига нисбатан 2 та комбинация оралиқ кўринишга эга бўлди. Бироқ, F_3C-5712 x Poly tex Sirdaryo дурагай комбинациясида мазкур белгининг ўртача кўрсаткичи ота-онага нисбатан бир хил кўринишда 6,1 граммни ташкил этди.

Бир дона кўсакдаги пахта вазни белгиси бўйича F_3 дурагай комбинацияларда ўзгарувчанлик коэффициенти 4,5-13,3% ни ташкил этди. Мазкур белги бўйича энг юқори ўзгарувчанлик коэффициенти 13,3% (F_3C-5707 x Сирдарё-1), энг паст кўрсаткич 4,5% (F_3Сирдарё-1 x Гулистон) дурагайларида кузатилди. Ўрганилган ота-она шакллари ва уларнинг F_3 дурагайларида бир дона кўсакдаги пахта вазни белгиси ҳам вариатсион қаторда турли кўринишга эга бўлди. Ота-она шакллари кўрсаткичлари бўйича 5-6 та синфда жойлашган бўлса, F_3 дурагайлар кўрсаткичлари эса вариацион қаторнинг 10 та синфдан жой эгаллади. Демак, ушбу белги бўйича ҳам F_3 дурагайларида кенг миқёсда ажралиш жараёни кечиб трансгрессив ўсимликлар ажралиб чиқди.

Бир дона кўсакдаги пахта вазни белгиси бўйича ота-она шакллари ва F_3 дурагай комбинацияларнинг ўзгарувчанлиги

№	Комбинация номи	n	синфлар чегараси (к-0,5 г)										$X \pm S_x$	V %
			4,0 - 4,4	4,5 - 4,9	5,0 - 5,4	5,5 - 5,9	6,0 - 6,4	6,5 - 6,9	7,0 - 7,4	7,5 - 7,9	8,0 - 8,4	8,5 - 8,9		
1	Гулистон	97	-	-	-	4	8	22	28	33	2	-	7,6±0,06	5,2

2	Poly tex Sirdaryo	103	-	1	18	60	14	9	1	-	-	-	5,9±0,02	17,8
3	Сирдарё-1	91	-	3	41	30	10	6	1	-	-	-	5,1±0,04	5,8
4	С-5707	87	-	-	4	8	49	21	5	-	-	-	6,1±0,1	14,2
5	С-5712	106	-	-	6	9	38	33	20	-	-	-	6,1±0,04	4,8
6	Сирдарё-1 х Гулистон	72	2	2	2	4	6	38	11	5	1	1	6,5±0,03	4,5
7	С-5707 х Сирдарё-1	247	3	6	29	85	68	46	5	4	1	-	5,6±0,02	13,3
8	С-5712 х Poly tex Sirdaryo	188	2	4	4	14	84	64	10	3	2	1	6,1±0,04	4,8

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4-SECTION

DESIGN, SYNTHESIS, AND VALIDATION OF OLIGONUCLEOTIDE PRIMERS SPECIFIC TO THE APOPTOSIS-REGULATORY BCL-2 GENE FOR ELUCIDATING THE MECHANISM OF CYTOTOXIC ACTIVITY

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***Abstract**: Apoptosis is central to homeostasis and cancer suppression, with the anti-apoptotic Bcl-2 gene serving as a key biomarker of cytotoxic drug action. This study designed five primer pairs and one TaqMan probe specific to Bcl-2 using NCBI/GenBank and Primer3Plus (17–23 nt, Tm 55–63°C, GC 40–70%), synthesized them by solid-phase phosphoramidite chemistry, and purified them by PAGE. RT-PCR confirmed specificity, showing no amplification in Bcl-2-negative E. coli and efficient amplification in HeLa cells. SYBR Green qPCR (ΔΔCt) revealed higher Bcl-2 expression in HeLa versus fibroblasts, which decreased after treatment with the isoquinoline derivative F-21, suggesting apoptosis activation.*

***Keywords:** Bcl-2 and Bax gene, apoptosis, primer design, solid-phase phosphoramidite synthesis, PAGE, RT-PCR, real-time PCR, isoquinoline derivative, HeLa cells, cytotoxicity.*

INTRODUCTION

Apoptosis, programmed cell death, maintains organismal homeostasis and counters pathological processes such as cancer. The Bcl-2 gene family is central to this regulation: Bax is pro-apoptotic, whereas Bcl-2 is anti-apoptotic, and their balance determines cell fate. Bcl-2 overexpression, common in cancer, reduces apoptotic sensitivity and promotes treatment resistance. Cytotoxic compounds, including isoquinoline derivatives such as berberine and palmatine, can induce

apoptosis by modulating the Bcl-2/Bax system and activating caspases. Accurate assessment of Bcl-2 expression therefore requires highly specific oligonucleotide primers and probes. This study aimed to design, synthesize, and validate Bcl-2-specific primers to investigate the apoptosis-inducing mechanism of the isoquinoline derivative F-21 in HeLa cells, encompassing primer design, synthesis, purification, RT-PCR optimization, and quantitative real-time PCR analysis.

MATERIALS AND METHODS

2.1. Cell lines and reagents. HeLa (cervical carcinoma) and healthy fibroblast cell lines were used. The isoquinoline derivative F-21 served as the test cytotoxic agent, with cisplatin (10–30 μM) as reference control. Standard phosphoramidite, PCR, and PAGE/agarose electrophoresis reagents were used.

2.2. Primer design. The Bcl-2 sequence was retrieved from NCBI/GenBank; BLAST identified conserved regions. Primer3Plus was used to design five primer pairs and one TaqMan probe (JOE-labeled) (17–25 nt, Tm 55–63°C, GC 40–70%).

2.3. Synthesis. Oligonucleotides were synthesized on an ASM-2000 synthesizer via solid-phase phosphoramidite chemistry (coupling, oxidation, deblocking, washing cycles).

2.4. Purification. Products were purified by 20% PAGE (150 V, 1.5 h) and isolated by gel excision.

2.5. mRNA isolation. Total mRNA was extracted from HeLa and fibroblast cells using an ENKOR kit and stored at −70°C.

2.6. Specificity and RT-PCR optimization. Bcl-2-negative E. coli served as negative control; three buffer/temperature regimes were tested and visualized by agarose gel electrophoresis (0.8–3%).

2.7. Quantitative RT-PCR. SYBR Green-based qPCR was performed; relative Bcl-2 expression was calculated by the ΔΔCt method (2^−ΔΔCt).

2.8. Statistics. Data were analyzed by descriptive statistics and t-test/ANOVA ($p<0.05$ considered significant).

RESULTS

3.1. Primer design. Five primer pairs and one TaqMan probe (11 oligonucleotides total) specific to Bcl-2 were designed: 17–23 nt, Tm 62.6–73.9°C, GC 43.5–76.2% (Table 1).

No.	Oligo	Sequence (5'→3')	Length,nt	Tm,°C	GC,%	ΔG,kcal/mol
1	F01	5'-GCGATGAACTGGACAACAACAT-3'	22	64.2	45.5	-1.47
2	R01	5'-TAGCAAAGTAGAAAAGGGCAACC-3'	23	63.2	43.5	-0.96
3	F02	5'-GCGATGAACTGGACAACAACAT-3'	22	63.6	45.5	-1.47
4	R02	5'-TAGCAAAGTAGAAAAGGGCAACC-3'	23	63.2	43.5	-0.96
5	F05	5'-CAGCTGCCTTGGACTGTGTT-3'	20	64.9	55	-1.34
6	R05	5'-CAAGACCACTCTTCCCCACA-3'	20	63.5	55	-1.57
7	F04	5'-GCTTCAGGGTTTCATCCAGG-3'	20	62.6	55	-1.57
8	R04	5'-CACTCGCTCAGCTTCTTGGT-3'	20	64.2	55	-1.34
9	F03	5'-CCTTTTCTACTTTGCCAGCAAAC-3'	23	64.2	43.5	-0.96
10	R03	5'-GAGGCCGTCCCAACCAC-3'	17	64.4	70.6	-1.34
11	P04 [JOE]	5'-CGAGCTGGCCCTGGACCCGGt-3'	21	73.9	76.2	-1.34

Table 1. Characteristics of the oligonucleotides designed to be specific to the Bcl-2 gene.

3.2. Synthesis and purification. All oligonucleotides were successfully synthesized and purified to high purity by 20% PAGE.

3.3. Specificity. RT-PCR showed no amplification in Bcl-2-negative E. coli, while all five primer pairs amplified efficiently in HeLa cells, confirming high specificity.

3.4. Optimization. Buffer No. 2 gave the highest amplification efficiency and was selected as optimal; buffers 1 and 3 performed less well.

3.5. Quantitative analysis. Bcl-2 mRNA expression was significantly higher in HeLa than in fibroblast cells. F-21 treatment reduced Bcl-2 expression, consistent with the effect of cisplatin, suggesting activation of apoptosis.

DISCUSSION

The designed primers and probe met established design criteria (length, Tm, GC content), and the absence of amplification in E. coli confirmed their gene specificity, validating their use for Bcl-2 expression analysis in HeLa cells. Elevated Bcl-2 mRNA in cancer cells reflects suppressed apoptotic signaling, a well-documented feature of tumor resistance. The reduction in Bcl-2 expression after F-21 treatment suggests activation of the mitochondrial apoptotic pathway via the Bax/Bcl-2 balance, similar to mechanisms reported for berberine and related alkaloids; comparison with cisplatin supports this apoptosis-inducing potential, though protein-level validation is still needed. The developed RT-PCR/qPCR methodology offers a practical platform for screening Bcl-2-targeted cytotoxic agents, despite the limited sample size and absence of protein-level data.

CONCLUSION

1. Five Bcl-2-specific primer pairs and one probe were designed using the NCBI database and Primer3Plus.

2. The oligonucleotides were successfully synthesized by solid-phase phosphoramidite chemistry on an ASM-2000 synthesizer.

3. The products were purified to high purity by 20% PAGE.

4. Optimal RT-PCR buffer and temperature conditions were established.

5. A sensitive SYBR Green-based qPCR method was developed for Bcl-2 quantification.

6. Bcl-2 expression was elevated in HeLa versus healthy cells and decreased after F-21 treatment, confirming Bcl-2's role in apoptosis and F-21's apoptosis-inducing potential.

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NEUROMOTOR SYMMETRY AND AGILITY PROFILING IN ELITE FEMALE TAEKWONDO ATHLETES USING THE QUICK BOARD SYSTEM

Boykuziyev Jasur

Annotation: *This study constructed a standardized, multi-component neuromotor performance profile (symmetry, reaction, explosiveness, proprioception, and movement efficiency) in 24 elite female taekwondo athletes using the Quick Board system. Symmetry (98.3%) and reaction (92.3%) were highly optimized, whereas proprioception/accuracy (66.7%) and movement efficiency (61.5%) were the weakest components, indicating that neuromotor performance is unevenly developed despite a high global symmetry index. These findings support targeted, precision-based neuromotor training for elite taekwondo athletes.*

Keywords: *taekwondo, neuromotor profiling, Quick Board, interlimb symmetry, movement efficiency, proprioception*

INTRODUCTION

Taekwondo competition is characterized by explosive lower-limb actions — roundhouse, spinning, and counterattacking kicks — that require optimal coordination between reaction time, balance, and movement efficiency. Interlimb symmetry has been identified as a factor influencing both performance efficiency and injury risk in combat sports (Bishop et al., 2018; Maloney, 2019), yet a single aggregate symmetry score can obscure the fact that the underlying neuromotor components contributing to it may be unevenly developed.

Recent advances in sports science emphasize field-based neuromotor assessment tools that provide ecologically valid, repeatable measurements outside the laboratory. The Quick Board system is one such technology, enabling simultaneous evaluation of reaction time, movement efficiency, and coordination under sport-specific conditions (Young et al., 2015; Turner et al., 2019). Movement efficiency — the ability to perform rapid, accurate motor actions with minimal errors — and proprioceptive control are additional components linked to superior decision-making speed and motor execution

accuracy (Sheppard & Young, 2006; Brughelli et al., 2008; Paillard, 2017). However, most existing studies examine isolated kinematic variables or general fitness parameters rather than building a unified, multi-component neuromotor profile, and female athletes remain underrepresented in this literature.

PURPOSE

This thesis aims to construct a standardized, multi-component neuromotor performance profile — spanning symmetry, reaction, explosiveness, proprioception, and movement efficiency — for elite female taekwondo athletes, and to identify which components represent the primary limiting factors for performance consistency.

METHODS

Twenty-four elite female taekwondo athletes, free from musculoskeletal injury or neurological disorder, completed a standardized Quick Board assessment protocol under controlled conditions. Measured variables included reaction time (s), contact time (s), movement efficiency (number of successful actions), and a between-limb symmetry index (%). From these raw measures, composite neuromotor components — symmetry, reaction, explosiveness, proprioception/accuracy, and movement efficiency — were derived and standardized to a 0–100% scale to build a comparative radar-style performance profile. Between-limb raw-variable differences were additionally evaluated using repeated-measures analysis, Hedges' g, and η^2, at $p < 0.05$.

RESULTS

The standardized neuromotor profile revealed clear variability across components. Symmetry scored highest (98.3%), indicating an almost optimal level of bilateral coordination, followed closely by reaction (92.3%), reflecting strong neuromotor responsiveness. Explosiveness reached 77.0% — approximately 15.3 percentage points below reaction — suggesting that rapid responsiveness does not fully translate into maximal force-generation output. Proprioception/accuracy (66.7%) and movement efficiency (61.5%) were the

lowest-scoring components: the gap between movement efficiency and symmetry reached 36.8 percentage points, and the gap between proprioception and reaction reached 25.6 percentage points, together marking these two components as the profile's primary weaknesses.

At the underlying raw-variable level, contact time was nearly identical between limbs (0.191±0.08 s vs. 0.188±0.05 s; $F(1,46)=0.02$; $g=0.04$; $\eta^2=0.001$) and overall symmetry percentage differed only slightly (100.0±12.3% vs. 96.6±11.2%; $F(1,46)=1.00$; $g=0.28$; $\eta^2=0.021$). In contrast, reaction time (0.866±0.07 s vs. 0.711±0.08 s; $F(1,46)=51.03$; $g=2.03$; $\eta^2=0.526$) and movement efficiency (11.0±1.20 vs. 8.0±0.74 actions; $F(1,46)=108.67$; $g=2.96$; $\eta^2=0.703$) showed very large between-limb effects, confirming that these two raw variables are the main drivers of the lower composite scores for proprioception and movement efficiency in the standardized profile.

Table 1. Between-Limb Comparison of Neuromotor Agility and Lower-Limb Symmetry Indicators

Indicator	Left Limb (n=24)	Right Limb (n=24)	F(1,46)	Hedges' g	η^2	Interpretation
Contact Time (s)	0.191±0.08	0.188±0.05	0.02	0.04	0.001	Trivial difference
Reaction Time (s)	0.866±0.07	0.711±0.08	51.03	2.03	0.526	Very large asymmetry
Movement Efficiency (n)	11.0±1.20	8.0±0.74	108.67	2.96	0.703	Extremely large difference
Symmetry (%)	100.0±12.3	96.6±11.2	1.00	0.28	0.021	Small difference

DISCUSSION AND CONCLUSION

The composite profile shows that neuromotor performance in elite female taekwondo athletes is unevenly developed: global bilateral coordination (symmetry) and reaction speed are highly optimized, while proprioceptive accuracy and movement efficiency remain comparatively underdeveloped and constitute the primary limiting factors for performance consistency. Because a high aggregate symmetry score can coexist with pronounced asymmetries in specific neuromotor components, reporting a single composite symmetry index

is insufficient for training prescription; a multi-component profile is needed to reveal where functional limitations actually reside.

Overall, the Quick Board assessment proved an effective, ecologically valid tool for generating this profile in an applied setting. These findings support incorporating precision-based neuromotor training — targeting proprioceptive control and movement efficiency in particular — alongside the already well-developed symmetry and reaction capacities, to optimize individualized training design and improve performance consistency in elite taekwondo athletes.

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INTERLIMB ASYMMETRY IN REACTION TIME AND MOVEMENT EFFICIENCY AMONG ELITE FEMALE TAEKWONDO ATHLETES: A QUICK BOARD-BASED ANALYSIS

Boykuziyev Jasur

Annotation*:This study examined between-limb differences in reaction time and movement efficiency in 24 elite female taekwondo athletes using the Quick Board system. Results revealed a very large reaction-time asymmetry favoring the right limb (g=2.03) alongside a very large movement-efficiency advantage for the left limb (g=2.96), indicating that these two components are not interchangeable indicators of neuromotor performance and should be assessed independently in training design.*

Keywords: *taekwondo, interlimb asymmetry, reaction time, movement efficiency, Quick Board, neuromotor performance*

INTRODUCTION

Efficient motor performance in combat sports depends on the integration of neuromotor control, reaction speed, and interlimb coordination. In taekwondo, athletes must execute rapid, powerful kicking techniques under time-constrained and unpredictable conditions, so the capacity to generate precise, well-timed lower-limb movements is decisive for competitive success. Prior biomechanical work has linked successful kicking performance to rapid force generation and precise temporal sequencing across the kinetic chain (Falco et al., 2009; Estevan et al., 2011).

Interlimb asymmetry — a performance difference between the dominant and non-dominant limb — is commonly observed even among elite athletes, and while a degree of asymmetry may reflect sport-specific specialization, excessive asymmetry has been associated with reduced performance and elevated injury risk (Croisier et al., 2008; Hart et al., 2014; Bishop et al., 2018; Maloney, 2019). Because taekwondo athletes repeatedly load one limb through habitual kicking patterns, reaction time and movement efficiency are two neuromotor

components particularly susceptible to this kind of functional divergence, yet their combined between-limb behavior in elite female athletes has received limited direct attention. Field-based tools such as the Quick Board system now make it practical to quantify these components under sport-specific, ecologically valid conditions rather than only in the laboratory (Young et al., 2015; Turner et al., 2019).

PURPOSE

This thesis aims to quantify and interpret the magnitude of between-limb differences in reaction time and movement efficiency among elite female taekwondo athletes, using a standardized field-based neuromotor assessment, and to discuss the practical implications of any dissociation between these two components.

METHODS

Twenty-four elite female taekwondo athletes, actively competing at a high level with several years of training experience, participated in the study. Inclusion criteria required freedom from musculoskeletal injury and neurological disorders at the time of testing; all athletes provided informed consent, and the study followed accepted ethical standards for human research.

Neuromotor performance was assessed with the Quick Board system, which allows evaluation of reaction time, contact time, movement efficiency, and interlimb coordination under controlled, standardized conditions. Athletes responded as quickly and accurately as possible to visual stimuli by performing rapid lower-limb movements on the Quick Board platform; left and right limbs were tested separately to allow between-limb comparison, and the most technically valid trial per limb was retained for analysis. Descriptive statistics are reported as mean ± standard deviation. Between-limb differences were evaluated using repeated-measures analysis; effect sizes were calculated with Hedges' g, and η^2 (eta squared) estimated the proportion of explained variance. Significance was set at $p < 0.05$.

RESULTS

Reaction time showed the more pronounced of the two focal asymmetries: the left limb responded more slowly (0.866±0.07 s) than the right limb (0.711±0.08 s), an absolute difference of 0.155 s supported by a very high F value (F(1,46)=51.03), a very large effect size (g=2.03), and substantial explained variance (η^2=0.526), confirming a marked neuromotor delay in the left limb.

Movement efficiency produced the largest between-limb contrast of all measured variables and ran in the opposite direction to reaction time: the left limb completed 11.0±1.20 successful actions compared with 8.0±0.74 for the right limb, an absolute difference of 3.0 repetitions, reflected in F(1,46)=108.67, an extremely large effect size (g=2.96), and a very high proportion of explained variance (η^2=0.703). For reference, contact time was nearly identical between limbs (0.191±0.08 s vs. 0.188±0.05 s; g=0.04; η^2=0.001), and overall symmetry percentage showed only a small between-limb difference (100.0±12.3% vs. 96.6±11.2%; g=0.28; η^2=0.021), confirming that the meaningful asymmetries in this sample were concentrated in reaction time and movement efficiency rather than in basic temporal contact characteristics.

Table 1. Between-Limb Comparison of Neuromotor Agility and Lower-Limb Symmetry Indicators

Indicator	Left Limb (n=24)	Right Limb (n=24)	F(1,46)	Hedges' g	η^2	Interpretation
Contact Time (s)	0.191±0.08	0.188±0.05	0.02	0.04	0.001	Trivial difference
Reaction Time (s)	0.866±0.07	0.711±0.08	51.03	2.03	0.526	Very large asymmetry
Movement Efficiency (n)	11.0±1.20	8.0±0.74	108.67	2.96	0.703	Extremely large difference

Symmetry (%)	100.0±12.3	96.6±11.2	1.00	0.28	0.021	Small difference

DISCUSSION AND CONCLUSION

The dissociation between a slower left-limb reaction time and a higher left-limb movement efficiency indicates that these two components are not interchangeable proxies for neuromotor performance and must be assessed independently rather than inferred from one another. This pattern is consistent with sport-specific unilateral loading in taekwondo, where habitual kicking-limb dominance can simultaneously delay the initial motor response while enhancing repeated-action output on the same side — plausibly reflecting greater trained motor efficiency built on top of a genuinely slower reaction latency.

From an applied standpoint, these findings support incorporating limb-specific reaction-time training for the slower-responding limb while preserving the movement-efficiency advantage already established, in order to reduce the competitive and injury-related risks associated with component-specific, rather than global, asymmetry. Because global symmetry indices in this sample remained comparatively high, relying on a single aggregate score would have concealed both effects; component-level assessment with tools such as the Quick Board system is therefore recommended for individualized training design in elite female taekwondo athletes.

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UDC 616.441-07:575.1

MOLECULAR GENETIC ASPECTS OF THYROID DISEASES: INTERACTION OF HEREDITARY AND IMMUNE FACTORS

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Abstract. *This article reviews current evidence on the genetic and epigenetic mechanisms underlying thyroid diseases, including autoimmune thyroid disorders, congenital hypothyroidism, and differentiated thyroid cancer. Genetic factors are shown to play a leading role in the development of autoimmune thyroid diseases, while epigenetic mechanisms mediate the interaction between hereditary predisposition and environmental factors. The importance of genetic and epigenetic research for advancing personalized diagnosis, prognosis, and therapy is emphasized.*

Keywords: *thyroid gland; Graves' disease; Hashimoto's thyroiditis; congenital hypothyroidism; thyroid cancer; HLA-DRβ1; CTLA-4; PTPN22; PAX8; DUOX2; FOXE1; GWAS; polygenic risk scores.*

INTRODUCTION

The thyroid gland plays a key role in regulating energy metabolism, growth, nervous system development, and cardiovascular and reproductive function. Thyroid diseases — including autoimmune thyropathies, congenital hypothyroidism, and differentiated cancer — are among the most common endocrine disorders and occur 5–10 times more often in women than in men [1].

Structural and functional abnormalities of the thyroid gland are accompanied by pronounced metabolic changes and increase the risk of several diseases, including cardiovascular pathology [2–8].

Current research indicates that genetic factors play the leading role in the development of autoimmune thyroid diseases. According to twin studies, their contribution amounts to 60–80% for Graves' disease and approximately 70–75% for Hashimoto's thyroiditis [9, 10].

MATERIALS AND METHODS

This review is based on an analysis of publications from the PubMed/MEDLINE, Scopus, Web of Science, and eLibrary databases covering 2006–2024. Original studies, systematic reviews, and GWAS on the genetic and epigenetic mechanisms of thyroid disease were included; experimental studies lacking clinical validation and studies with small sample sizes were excluded. From more than 80 publications, the most informative sources were selected, including the work of Hishinuma (2012) and Rivolta & Targovnik (2006) [9, 10].

RESULTS AND DISCUSSION

In congenital hypothyroidism, mutations in the DUOX2 gene — which encodes an enzyme responsible for generating the hydrogen peroxide required for thyroid hormone synthesis — play an important role. Biallelic mutations have been shown to cause persistent hypothyroidism requiring lifelong replacement therapy, whereas monoallelic mutations more often produce transient forms of the disease [9]. Iodine transport is regulated by the SLC5A5 (NIS) and SLC26A4 (PDS) genes: the former mediates iodine uptake by thyrocytes, while the latter mediates its transport into the follicular lumen. By contrast, germline mutations in RET, as well as in PTEN and DICER1, characteristic of hereditary forms of the disease, carry direct clinical significance for early diagnosis and preventive measures in family members [1].

Table 1. Genes associated with thyroid diseases: mechanisms and clinical significance [9, 11]

Gene	Disease	Molecular mechanism	Clinical significance	Refs
HLA-DRβ1	GD, HT	Impaired negative thymic selection; the Arg74 variant alters the structure of the antigen-binding groove, making thyroid autopeptides "more suitable" for presentation	Increased risk of GD and HT across several ethnic groups; basis for antigen-specific immunotherapy	[1–4]
CTLA-4	GD, HT	Reduced competitive inhibition of B7 molecules; weakening of peripheral T-cell tolerance	Consistent association in European, Asian, and Latin American cohorts; potential target for abatacept	[2, 3]
PTPN22	GD, HT, T1D, RA	R620W variant: hyperactivation of the TCR signaling pathway; impaired clonal deletion of autoreactive lymphocytes	Pleiotropic — increases risk of several autoimmune diseases; points to a shared immunopathogenetic axis	[1–3, 6]
CD40	GD	Enhanced B-cell activation via the CD40–CD40L axis; overproduction of TRAb	Thyroid-stimulating antibodies → thyrotoxicosis; CD40 as a potential molecular target	[2, 3]
TSHR	GD	Altered expression and structure of the TSH receptor; facilitates TRAb binding; interacts with HLA-DRβ1-Arg74	Central autoantigen in GD; target for antigen-specific immunotherapy	[1, 3, 6]
TG	HT	Autoantigenic function; synergy between TG and HLA-DR variants exceeds simple additivity; the promoter variant is subject to epigenetic regulation via IFN-α	Dual role — substrate for hormonogenesis and autoantigen; classic example of gene–epigenome interaction	[2, 4]

TPO	CH, HT	Mutations impair thyroglobulin iodination; the protein simultaneously serves as an autoantigen (anti-TPO)	Anti-TPO antibodies in 90–95% of HT patients — main serological marker; cause of dyshormonogenesis in CH	[5, 7]
PAX8	CH (dysgenesis)	Transcription factor of thyroid embryogenesis: activates TG, TPO, NIS; heterozygous mutations → athyreosis/ectopia	Most frequently confirmed cause of thyroid dysgenesis; variable penetrance within families	[5, 7]
DUOX2	CH (dyshormonogenesis)	Biallelic mutations → severe, permanent H_2O_2 deficiency; monoallelic mutations → transient neonatal hypothyroidism	Most frequently mutated gene in dyshormonogenesis; allelic status determines severity and treatment strategy	[5, 7]
NIS/PDS	CH	NIS: impaired iodine uptake by thyrocytes; PDS: defective apical iodine transport → Pendred syndrome	Intrathyroidal iodine deficiency; Pendred syndrome (PDS) — CH plus sensorineural hearing loss	[5]
FOXE1	Thyroid cancer (papillary)	rs965513 — the most significant GWAS locus for thyroid cancer; impairs thyrocyte differentiation	OR ≈ 1.75; reproducible association across several independent GWAS	[9]
NRG1/DIRC3	Thyroid cancer	NRG1: activates ErbB/HER proliferation pathways; DIRC3 (2q32.3): function under investigation	Moderate-risk variants identified by GWAS	[9]
RET/PTEN/DICER1	Hereditary thyroid cancer	Highly penetrant germline mutations: RET → medullary thyroid carcinoma (MEN2A/2B); PTEN → Cowden syndrome; DICER1 → thyroid tumors	Indication for screening of relatives and prophylactic thyroidectomy in childhood (RET)	[8, 11]

Abbreviations: GD — Graves' disease; HT — Hashimoto's thyroiditis; CH — congenital hypothyroidism; T1D — type 1 diabetes; RA — rheumatoid arthritis.

CONCLUSION

Genetic and epigenetic mechanisms play a key role in the development of thyroid diseases. In autoimmune thyropathies, the HLA, CTLA-4, PTPN22, TG, TSHR, and TPO genes are of primary importance, underlying impaired immune tolerance and disease susceptibility. In congenital hypothyroidism, molecular diagnosis of DUOX2 and PAX8 mutations is important for treatment strategy and prognosis. In thyroid cancer, FOXE1 variants are used to assess genetic risk, whereas germline mutations in RET and PTEN determine personalized patient management strategy.

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GEOGRAPHIC INFORMATION SYSTEM-BASED ASSESSMENT OF POPULATION HEALTH UNDER THE INFLUENCE OF INDUSTRIAL ZONES: THE CASE OF NAVOI REGION

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Annotation*: This article presents a geographic information system-based model for the integrated assessment of industrial zones, sanitary protection zones, and population health indicators in Navoi Region. Health statistics from the Ministry of Health for 2025, territorial morbidity rates, and international experience in spatial epidemiology were compared. The results demonstrate the need for continuous monitoring of respiratory, cardiovascular, dermatological, endocrine, and oncological indicators in communities located near industrial areas.*

Keywords: *geographic information system, industrial exposure, sanitary protection zone, morbidity, buffer analysis, spatial join, accessibility analysis, Navoi Region.*

Abstract*: The article develops a geographic information system-based model for the integrated assessment of industrial exposure zones and population health indicators in Navoi Region. Health statistics for 2025, territorial morbidity rates, and international spatial epidemiology approaches were compared. The findings support continuous monitoring of respiratory, cardiovascular, dermatological, endocrine, and oncological indicators in settlements located near industrial areas.*

Keywords: *geographic information system, industrial exposure, sanitary protection zone, morbidity, buffer analysis, spatial join, accessibility analysis, Navoi Region.*

INTRODUCTION

The assessment of population health in industrialized areas should not be limited to counting the total number of disease cases. When medical and statistical data are not linked to their territorial context, it becomes difficult to determine which community, industrial source, or healthcare facility should be prioritized for preventive measures. Therefore, in modern healthcare management, morbidity indicators are analyzed together with environmental exposure, population distribution, travel time to healthcare facilities, and the workload of medical services [1,2].

Geographic information systems perform two important functions in this process. First, industrial facilities, settlements, community boundaries, and healthcare institutions are integrated within a single coordinate system. Second, distances, buffer zones, isochrone coverage, and spatial intersections between these objects are calculated. As a result, medical decisions are based not on a simple table, but on territorial evidence visualized on a map [11,12].

Navoi Region is one of the most highly industrialized areas of Uzbekistan. The region contains a concentration of chemical industries, mining activities, cement and construction-material production, energy facilities, transport and logistics flows, and settlements surrounding major cities. Under these conditions, respiratory and cardiovascular diseases, skin disorders, endocrine and metabolic disorders, and oncological indicators should be examined as distinct epidemiological signals.

The aim of the study was to assess population health indicators associated with the influence of industrial zones in Navoi Region using GIS, link Ministry of Health statistics with a territorial exposure model, and develop a medical-geographical monitoring algorithm based on international scientific and practical experience. The objectives were to analyze disease groups, construct a territorial signal index, substantiate an analysis of access to healthcare facilities, and develop a regulatory and practical proposal.

MATERIALS AND METHODS

The study was designed as an environmental geospatial epidemiological analysis. The main data were divided into three groups: first, Ministry of Health morbidity statistics for Navoi Region for 2025; second, the spatial data model defined in the technical specifications for the development of a healthcare geoportal; and third, methods for assessing air pollution, noise, industrial proximity, and spatial access to healthcare used in international scientific publications and organizational practice [1-5].

Ministry of Health statistics were treated as comprising three main layers: registered diseases, newly diagnosed cases, and persons under dispensary follow-up at the end of the reporting period. This three-component analysis makes it possible to distinguish the total burden of disease, the intensity of new case detection, and the burden of long-term follow-up. For example, the proportion of newly diagnosed cases may be high for respiratory diseases, whereas dispensary follow-up may predominate for cardiovascular and endocrine diseases.

Under the Healthcare Geoportal concept, healthcare facilities, communities, districts, and regions are stored in a Postgeographic information system-based spatial core; the administrative affiliation of each facility is determined using a point-in-polygon function; and only verified facilities are displayed on the public-facing geoportal. This approach was adopted as the technical foundation for the medical-statistical model presented in the article.

At the GIS stage, industrial facilities are entered as points or polygons. A point may represent an industrial stack, emission source, or enterprise center, whereas a polygon represents the boundary of a plant site, industrial zone, quarry, or production area. Each facility is assigned attributes describing the industrial sector, potential pollutants, regulatory sanitary protection zone, production capacity, and transport load.

The morbidity rate was calculated using the following formula: $K = H / A \times 100{,}000$, where H is the number of disease cases, A is the assigned or territorial

population, and K is the rate per 100,000 population. If the age structure differs substantially between territories, age-standardized rates should be used in subsequent stages. In this article, crude territorial rates and analytical signal indices were calculated on the basis of the available statistical dataset.

Five priority indicators were selected to construct the territorial signal index: diseases of the respiratory system, diseases of the circulatory system, diseases of the skin and subcutaneous tissue, newly diagnosed neoplasms, and endocrine and metabolic disorders. District and city values for each indicator were standardized as z-scores and then combined into a composite index. This index does not imply causality; rather, it is used to identify territories that should be prioritized for in-depth investigation within geographic information system-based monitoring.

Table 1. Data sources and GIS layers

Layer	Data content	GIS operation	Result indicator
Industrial facilities	Enterprise type, coordinates, SPZ, pollutant	Buffer, intersect, overlay	Exposure zone
Population and community	Population size, age structure, territorial boundary	Point-in-polygon, spatial join	Population within the zone
Morbidity	ICD groups, cases, rate per 100 000 population	Join by territory/zone	Healthcare burden map
Healthcare facilities	Coordinates, facility type, capacity, assigned population	Network/accessibility analysis	15/30/60-minute coverage
Environmental factors	PM2.5, PM10, NO2, SO2, CO, noise	Raster/vector overlay	Integrated risk index

RESULTS

The Ministry of Health statistical dataset for 2025 revealed a multilayered structure of the healthcare burden in Navoi Region. Among all registered diseases, respiratory diseases ranked first, with 142 557 cases and a rate of 12 920,9 per 100 000 population. Newly diagnosed cases in this group totaled 121 798, meaning that 85,4% of registered cases were associated with new diagnoses. This indicator suggests pronounced seasonality, airborne dust exposure, infectious factors, and high healthcare-seeking activity for respiratory diseases.

The second largest group comprised diseases of the digestive system, with 72 034 cases and a rate of 6 528,9 per 100 000 population. Diseases of the blood and blood-forming organs accounted for 69 493 cases, diseases of the circulatory system for 54 501 cases, and injuries and poisoning for 52 287 cases. From the perspective of industrial and environmental monitoring, respiratory, cardiovascular, dermatological, endocrine, and oncological indicators were analyzed separately because international literature has examined them most extensively in relation to air pollution, dust, NO2, PM2.5, noise, and proximity to industrial areas [5-10].

Table 2. Leading disease groups in Navoi Region, 2025

Disease group	Registered	Per 100 000 population	Newly diagnosed	Share newly diagnosed	Dispensary follow-up	Share under follow-up
Respiratory system	142 557	12 920,9	121 798	85,4%	22 470	15,8%
Digestive system	72 034	6 528,9	49 537	68,8%	21 791	30,3%
Blood and blood-forming organs	69 493	6 298,6	36 222	52,1%	36 510	52,5%
Circulatory system	54 501	4 939,8	16 149	29,6%	47 706	87,5%
Injuries and poisoning	52 287	4 739,1	51 094	97,7%	1 171	2,2%
Endocrine and metabolic disorders	30 892	2 800,0	8 228	26,6%	28 782	93,2%
Genitourinary system	29 665	2 688,7	15 041	50,7%	15 368	51,8%
Infectious and parasitic diseases	29 076	2 635,4	20 974	72,1%	7 964	27,4%

At the territorial level, the highest rate of respiratory diseases was observed in Navbahor District, at 23 732,4 per 100 000 population. This was followed by Konimex with 20 234,2, Karmana with 15 206,4, and Navoi City with 14 418,6. These differences cannot be interpreted as being directly caused by industry; however, air quality, dust exposure, traffic flow, seasonal respiratory infections, healthcare-seeking behavior, and the age structure of the population should be assessed jointly in these territories.

Navbahor, Gozgon City, Karmana, Qiziltepa, and Nurota were among the territories with the highest rates of circulatory system diseases. This group is

important for industrial and environmental analysis for two reasons. First, numerous international studies have linked air pollution to the risk of cardiovascular disease. Second, noise has also been associated with arterial hypertension, ischemic heart disease, and stroke [8-10].

Dermatological disease rates were relatively high in Nurota, Xatirchi, Gozgon City, Uchquduq, and Karmana. Skin diseases may be associated with airborne dust, water quality, household and hygienic conditions, occupational exposure, and allergic predisposition. Therefore, in geographic information system-based monitoring, dermatological indicators should be compared not only with outpatient visits but also with layers representing sanitary conditions, water supply, and industrial dust exposure.

The highest crude rate of newly diagnosed neoplasms was recorded in Gozgon City. Navoi City, Nurota, Xatirchi, Konimex, and Navbahor were also among the territories with relatively high rates. One year of statistics is insufficient to draw causal conclusions regarding oncological diseases. This group requires an integrated cohort or ecological analysis incorporating a trend of at least 5-10 years, age standardization, occupation, smoking, migration, screening coverage, and environmental measurements [8].

Higher rates of endocrine and metabolic disorders were observed in Karmana, Tomdi, Nurota, Gozgon City, and Navbahor. Endocrine diseases may be associated not only with industrial pollutants but also with lifestyle, nutrition, iodine deficiency, obesity, stress, the level of case detection, and the quality of dispensary follow-up. Therefore, GIS analysis of this group should be conducted together with assessments of access to healthcare, the availability of laboratory diagnostics, and coverage by preventive programs.

Table 3. Territorial signal indicators for industrial and environmental monitoring

Indicator	Territories with the highest rates	Rate per 100 000 population	Analytical interpretation
Respiratory system	Navbahor, Konimex, Karmana, Navoi City	23 732,4; 20 234,2; 15 206,4; 14 418,6	Assessed in relation to air quality, dust, seasonality, and healthcare-seeking activity

Indicator	Territories with the highest rates	Rate per 100 000 population	Analytical interpretation
Circulatory system	Navbahor, Gozgon City, Karmana, Qiziltepa	7 075,2; 6 761,6; 6 052,1; 5 669,2	Compared with PM2.5, NO2, noise, and age structure
Skin diseases	Nurota, Xatirchi, Gozgon City, Uchquduq	1 655,1; 1 559,4; 1 530,9; 1 306,9	Linked to dust, water, hygiene, and occupational exposure
Neoplasms	Gozgon City, Navoi City, Nurota, Xatirchi	1 084,4; 634,7; 530,9; 525,6	Requires multiyear trends and age standardization
Endocrine and metabolic	Karmana, Tomdi, Nurota, Gozgon City	3 851,2; 3 787,7; 3 623,3; 3 561,6	Assessed in relation to dispensary follow-up, laboratory diagnostics, and lifestyle

Diseases of the circulatory system showed a strongly age-dependent profile: 60,3% of cases were recorded among people aged 50-69 years, 19,1% among those aged 70 years and older, and 18,1% among those aged 30-49 years. This finding demonstrates the need for age standardization in industrial and environmental analysis. If the proportion of older people is high in a territory, the crude rate may reflect differences in demographic composition rather than an increased environmental effect alone.

For oncological indicators, the 50-69-year age group accounted for 50,0%, and the 30-49-year age group for 33,2%. Among skin diseases, people aged 50-69 years accounted for 32,4%, those aged 30-49 years for 30,2%, and those aged 18-29 years for 10,9%. For endocrine and metabolic disorders, the 50-69-year group ranked first with 39,4%, followed by the 30-49-year group with 23,3%. These data demonstrate that the age-sex pyramid must be incorporated into the GIS model together with territorial exposure.

Calculation of the territorial signal index identified Gozgon City, Nurota, Karmana, and Navbahor as priority areas for further investigation. Gozgon City had the highest integrated index because rates of neoplasms, circulatory system diseases, and skin diseases were simultaneously elevated. Navbahor showed strong respiratory and cardiovascular signals. In Karmana District, respiratory, cardiovascular, dermatological, and endocrine indicators were all relatively high.

Table 4. Territorial signal index for five priority indicators

Territory	Respiratory	Circulatory	Skin	Neoplasms	Endocrine	Signal index
Gozgon City	10 939,8	6 761,6	1 530,9	1 084,4	3 561,6	5,74
Nurota	11 753,2	5 397,7	1 655,1	530,9	3 623,3	2,75
Karmana	15 206,4	6 052,1	1 272,6	349,0	3 851,2	2,33
Navbahor	23 732,4	7 075,2	507,3	438,5	3 104,0	2,17
Konimex	20 234,2	4 534,6	837,2	499,6	2 357,8	-0,10
Xatirchi	9 528,8	4 823,4	1 559,4	525,6	2 125,0	-0,20

DISCUSSION

The WHO AirQ+ approach provides a standardized model for estimating the health burden of air pollution. It incorporates pollutant concentrations, the level of population exposure, and baseline morbidity or mortality rates. Full application of this model in Navoi requires monitoring-station or sensor data for PM2.5, PM10, NO2, SO2, CO, and industry-specific substances [1,2]. At the current stage, Ministry of Health statistics can be used to generate a GIS signal map, but causal estimation remains limited in the absence of pollutant concentration data.

The experience of the European Environment Agency focuses on linking industrial emissions with health and economic damage. EEA reports analyze emissions from major industrial facilities, pollutants, and external costs, demonstrating that a small number of high-emission facilities may account for a substantial share of the overall burden of damage [3,4]. In Navoi Region, the largest chemical, cement, energy, and mining facilities should likewise be represented as a separate layer, with automatic updates of the surrounding population and relevant health indicators.

International studies of the relationship between residence near industrial zones and respiratory symptoms demonstrate the practical value of proximity analysis. For example, studies comparing residents living within 5 km of industrial areas with those living more than 5 km away have reported differences in cough, sputum production, shortness of breath, chronic bronchitis, and asthma [5]. In Navoi, respiratory consultations may likewise be compared across zones of 0-500 m, 500-1 000 m, 1-3 km, 3-5 km, and more than 5 km.

Noise is particularly important for Navoi Region. Industry, heavy freight transport, railways, and urban traffic may jointly increase acoustic exposure. International reviews published in 2024-2025 indicate that transport noise may affect cardiovascular disease, arterial hypertension, sleep disorders, and mental health [9,10]. Industrial analysis should therefore extend beyond air pollution and also include daytime and nighttime noise maps.

Spatial access to healthcare should be considered together with environmental risk. If respiratory or cardiovascular indicators are high in an area near industrial facilities, while the nearest family polyclinic, laboratory, radiography unit, or emergency medical station is located far away, the health impact is compounded: the probability of disease increases while opportunities for early detection decrease. International geographic information system-based accessibility studies assess service coverage using 15-, 30-, and 60-minute isochrones, the 2SFCA method, and transport-network analysis [11,12].

The practical advantage of the model proposed for Navoi Region is that it integrates Ministry of Health statistics, the geoportal registry, and industrial-environmental layers into a single decision-making chain: industrial facility - buffer zone - community population - morbidity rate - healthcare-facility coverage - preventive measure. Once this chain is operational, the map can indicate where screening, laboratory surveillance, a new branch facility, or a mobile medical team is required.

Nevertheless, the available statistics already provide a sufficiently strong signal for management decisions. It is recommended to strengthen air-quality monitoring in territories with high respiratory disease rates; review hypertension screening and dispensary follow-up in territories with high cardiovascular disease rates; compare sanitary-hygienic conditions and water-supply layers in territories with high rates of skin disease; and geocode long-term registries and screening coverage for neoplasms.

Table 5. International experience and its potential application in Navoi Region

International approach	Core concept	Adaptation for Navoi
WHO AirQ+	Assessment of health burden using pollutant concentration and baseline rates	Linking PM2.5, PM10, NO2, and SO2 measurements with Ministry of Health statistics
EEA industrial emissions	Assessment of emissions from major enterprises and external health costs	Creating risk layers for chemical, cement, energy, and mining facilities
Proximity analysis	Comparison of distance to industrial zones and respiratory symptoms	Calculating morbidity in 0-500 m, 1-3 km, 3-5 km, and control zones
Noise health risk assessment	Assessment of noise-related cardiovascular, sleep, and mental-health outcomes	Combining daytime/nighttime noise maps with transport and industrial layers
Healthcare accessibility	15/30/60-minute isochrones, 2SFCA, network analysis	Justifying the location of new healthcare facilities using demographic need and environmental risk

PRACTICAL GIS ALGORITHM AND REGULATORY PROPOSAL

Based on the study findings, a practical algorithm suitable for use in a healthcare geoportal is proposed. In the first stage, industrial facilities are inventoried by entering the facility name, industrial sector, coordinates, area, sanitary protection zone, principal pollutants, operating schedule, and traffic flow. In the second stage, point-in-polygon and spatial join operations are performed using community and healthcare-facility layers. In the third stage, the population, age groups, disease cases, and rate per 100 000 population are calculated for each buffer zone.

In the fourth stage, the territorial signal index for priority indicators is updated automatically. Areas with high index values are marked in red or orange on the dashboard. Priority is assigned not to a single elevated value, but to a multi-indicator and multi-year signal. In the fifth stage, travel time to healthcare facilities is calculated by creating separate isochrones for walking, private vehicles, ambulances, and public transport.

In the sixth stage, the decision-support module is activated. If a large population lives within an industrial buffer, respiratory or cardiovascular indicators are high, and travel time to healthcare exceeds 30 minutes, the system recommends a preventive medical team, a new branch facility, a laboratory

point, or a screening campaign. If the proportion of persons under dispensary follow-up is high but the rate of new detection is low, the chronic disease registry and medicine supply are reviewed.

In the seventh stage, monitoring results are stored in an audit log. Because the technical specifications for the Healthcare Geoportal provide for multistage moderation, an audit log, Excel and PDF export, a public-facing geoportal, and a self-hosted architecture, this algorithm can be incorporated into the existing technical concept. This will support territorial planning in the healthcare system with digital evidence.

As a regulatory and practical proposal, the following provision should be incorporated into construction and healthcare standards: when establishing a new healthcare facility, expanding an existing facility, or opening a branch, GIS analysis of population travel time, the size of the assigned population, the existing healthcare burden, sanitary protection zones around industrial facilities, noise, and air-pollution risk shall be mandatory. The results of the analysis shall be attached to the design and cost-estimate documentation and stored in an electronic GIS database.

CONCLUSION

As a region with intensive industrial, mining, chemical, construction-material, and energy activities, Navoi Region is an important area for medical-geographical monitoring. According to Ministry of Health statistics for 2025, respiratory diseases created the greatest burden in the region, while cardiovascular, dermatological, endocrine-metabolic, and oncological indicators were identified as priority groups for industrial and environmental monitoring.

Separate analysis of registered cases, newly diagnosed cases, and persons under dispensary follow-up provides a deeper understanding of the nature of the healthcare burden. The proportion of newly diagnosed cases was high for respiratory diseases, whereas dispensary follow-up predominated for cardiovascular and endocrine diseases. These findings demonstrate the need for

differentiated approaches to prevention, chronic disease management, and the territorial allocation of healthcare resources.

The territorial signal index identified Gozgon City, Nurota, Karmana, and Navbahor as priority areas for advanced GIS monitoring. However, the index does not directly prove an industrial effect. It becomes a powerful epidemiological tool when supplemented with environmental measurements, age standardization, multiyear trends, and socioeconomic factors.

International experience supports three directions for Navoi Region: a health-risk calculation model such as AirQ+, an approach based on industrial emissions and external damage as used by the EEA, and an assessment of healthcare coverage based on GIS accessibility. If these approaches are integrated with the local healthcare geoportal, industrial facilities, the population, morbidity, and healthcare infrastructure can function within a unified decision-support system.

As a practical measure, accessibility analysis and GIS assessment should be introduced as mandatory requirements when determining the location of new healthcare facilities. This requirement would make it possible to assess population coverage, emergency medical care, prevention, environmental risk, and the efficiency of healthcare infrastructure simultaneously.

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JOINT RANGE-OF-MOTION PROFILE OF AN ELITE FEMALE KARATEKA DURING THE EXECUTION OF URA MAWASHI GERI: A SINGLE-CASE 3D MOTION CAPTURE STUDY

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Abstract

Background: The ura mawashi geri (reverse/hook roundhouse kick) is a technically demanding karate strike whose effectiveness depends on coordinated multi-joint rotation and asymmetric loading between the kicking and supporting sides of the body. Objective: To describe the three-dimensional joint range-of-motion (ROM) profile of an elite female karateka during execution of ura mawashi geri and to characterise the degree of left-right asymmetry across the trunk, neck, shoulders, elbows, hips, knees and ankles. Methods: A single elite female karate athlete (age 20 years) was assessed at the HI-TECH Sports Laboratory using an optoelectronic three-dimensional motion analysis system. Minimum, maximum and total range values were extracted for the trunk, neck, shoulders, elbows, hips, knees and ankles, with bilateral comparison where applicable. Results: Pronounced left-right asymmetries were observed at the elbow (60° vs 3°), shoulder flexion-extension (54° vs 29°), knee (55° vs 20°) and hip abduction-adduction (19° vs -11°), while neck and trunk ranges were comparatively small and symmetrical. Conclusion: The joint ROM profile reflects the unilateral, rotational demand of ura mawashi geri, with the active-side limbs displaying markedly greater angular excursion than the supporting side. Single-case 3D ROM profiling may be a useful adjunct to technical and physical preparation monitoring in elite karate.

Keywords: *karate; ura mawashi geri; range of motion; biomechanics; 3D motion capture; case study*

INTRODUCTION

Karate kumite and kata performance depend on the athlete's capacity to generate large, well-timed joint excursions while maintaining postural control, and the roundhouse family of kicks (mawashi geri and its variants, including ura mawashi geri) is repeatedly identified as biomechanically demanding because of

the coordinated hip rotation, knee flexion-extension and trunk stabilisation it requires.

Prior biomechanical work on karate and related striking sports has shown that hip rotation range is one of the parameters that most clearly distinguishes execution quality in the mawashi-geri family of kicks, and that knee flexion range differentiates other kicking techniques such as yoko-geri, underlining that joint ROM is technique-specific rather than uniform across kicks.

Comparative work across Muay Thai, karate and taekwondo has further shown that expert practitioners of different disciplines achieve comparable kicking outcomes through markedly different joint coordination strategies, which argues for describing ROM profiles at the level of the individual athlete and technique rather than relying only on group means.

Despite this, published ROM data specific to ura mawashi geri in elite female karateka remain scarce, and most available studies report either isolated passive ROM screening or group-averaged kinematics without reporting the bilateral asymmetry that is inherent to a unilateral kicking action. The present case study addresses this gap by reporting a full-body, joint-by-joint ROM profile, with explicit left-right comparison, for a single elite female karateka performing ura mawashi geri.

The aim of this study was therefore twofold: (1) to quantify the minimum, maximum and total range of motion at the trunk, neck, shoulders, elbows, hips, knees and ankles during execution of ura mawashi geri in an elite female karateka, and (2) to characterise the pattern of left-right asymmetry across these joints as a marker of the technique's unilateral demand.

METHODS

PARTICIPANT

The participant was a 20-year-old (born 19 January 2006) elite female karate athlete affiliated with a national training programme. The athlete had no reported musculoskeletal injury at the time of testing and provided informed

consent for the assessment and for the anonymised use of the resulting data for research purposes, in line with a single-subject case-study design.

TESTING ENVIRONMENT AND INSTRUMENTATION

Testing was conducted at the HI-TECH Sports Laboratory, Uzbek State University of Physical Education and Sport (Chirchik, Uzbekistan), using an optoelectronic three-dimensional motion analysis (3DMA) system with retroreflective marker tracking. The system computed joint angles in the sagittal, frontal and transverse planes for the trunk, neck, shoulders, elbows, hips, knees and ankles.

PROCEDURE

Following a standardised warm-up, the athlete performed the ura mawashi geri technique while full-body kinematic data were captured. For each joint and movement plane, the system extracted the minimum angle, maximum angle, and total range of motion (maximum minus minimum) reached during technique execution. Bilateral (left/right) values were recorded separately for the shoulders, elbows, hips, knees and ankles; trunk and neck values were recorded as single midline measures. Sign convention followed the laboratory's default axis definitions (e.g., flexion/anterior/right as positive, extension/posterior/left as negative, as applicable to each joint).

DATA ANALYSIS

As a single-case design, data are reported descriptively (minimum, maximum and range, in degrees) without inferential statistical testing. Bilateral asymmetry was examined qualitatively by comparing the range of motion of homologous left- and right-side joints.

RESULTS

Table 1 presents the minimum, maximum and range values recorded for each joint and movement plane. Trunk tilt and lateral flexion showed negligible excursion (0° range), whereas the neck showed small ranges of 5-12° across flexion-extension, lateral flexion and rotation.

Joint / Movement	Plane	Side	Min (°)	Max (°)	Range (°)	Notes
Trunk	Tilt (ant.[+]/post.[-])	—	0	0	0	
Trunk	Lateral flexion (R[+]/L[-])	—	0	0	0	
Neck	Flexion[+]/Extension[-]	—	-26	-14	12	
Neck	Lateral flexion (R[+]/L[-])	—	-26	-15	10	
Neck	Rotation (R[+]/L[-])	—	-63	-58	5	
Shoulder	Flexion[+]/Extension[-]	Left	-28	26	54	
Shoulder	Flexion[+]/Extension[-]	Right	-20	10	29	
Shoulder	Abduction[+]/Adduction[-]	Left	36	68	31	
Shoulder	Abduction[+]/Adduction[-]	Right	48	0	-49	Right shoulder remained adducted
Elbow	Flexion[+]/Extension[-]	Left	56	116	60	
Elbow	Flexion[+]/Extension[-]	Right	117	120	3	Right elbow near-fixed
Hip	Flexion[+]/Extension[-]	Left	12	41	28	
Hip	Flexion[+]/Extension[-]	Right	-6	0	5	
Hip	Abduction[+]/Adduction[-]	Left	8	28	19	
Hip	Abduction[+]/Adduction[-]	Right	10	0	-11	Right hip remained adducted
Knee	Flexion[+]/Extension[-]	Left	17	73	55	

Joint / Movement	Plane	Side	Min (°)	Max (°)	Range (°)	Notes
Knee	Flexion[+]/Extension[-]	Right	23	44	20	
Ankle	Dorsal[+]/Plantar[-]	Left	-18	2	20	
Ankle	Dorsal[+]/Plantar[-]	Right	0	26	26	

Table 1. Joint range-of-motion values recorded during ura mawashi geri execution.

The most striking finding was the consistent left-right asymmetry in the appendicular joints. At the elbow, the left side moved through a 60° flexion-extension range compared with only 3° on the right, which remained close to full flexion (117-120°) throughout the trial. At the shoulder, flexion-extension range was greater on the left (54°) than the right (29°), and the right shoulder showed a small negative abduction-adduction range (-49°), indicating it stayed in an adducted position rather than moving through abduction. The knee followed the same pattern, with the left knee ranging through 55° of flexion-extension against 20° on the right. At the hip, the left side showed a 28° flexion-extension range and 19° of abduction-adduction range, while the right hip showed a markedly smaller flexion-extension range (5°) and a negative abduction-adduction range (-11°), again consistent with the right hip remaining in a relatively fixed, adducted position. The ankles were the one segment pair with broadly comparable range on both sides (20° left, 26° right), though the left ankle operated in a more plantarflexed arc (-18° to 2°) and the right in a more dorsiflexed arc (0° to 26°).

DISCUSSION

The joint ROM profile obtained in this case study is consistent with the expected biomechanical signature of a unilateral kicking technique such as ura mawashi geri, in which one limb (and its ipsilateral arm, used for balance and guarding) executes the striking action while the contralateral side functions

predominantly as a stable base. The left-side elbow, shoulder, hip and knee all showed two- to twenty-fold greater range of motion than their right-side counterparts, whereas the right hip and shoulder abduction-adduction values were negative, indicating these joints remained adducted rather than moving through an active arc. This pattern is compatible with prior evidence that hip rotation range is a key discriminator of technique quality in the mawashi-geri kick family, since the markedly larger left hip and knee excursion recorded here would be expected on the kicking side of a roundhouse-type technique.

The comparatively small and symmetrical trunk and neck ranges suggest that, in this athlete, postural control of the trunk and head was maintained with minimal angular displacement while the appendicular joints produced the large excursions needed to generate kicking velocity, a strategy broadly in line with reports that expert strikers can achieve technique effectiveness through efficient, targeted joint coordination rather than large whole-body displacement.

The near-symmetrical ankle ranges, despite the pronounced asymmetry elsewhere, may reflect the dual role of both ankles in this technique: the kicking-side ankle contributing to foot orientation at impact, and the supporting-side ankle absorbing and redirecting ground reaction forces to maintain balance throughout the kick. This is consistent with observations in other kicking sports that supporting-limb joint behaviour, including ankle range, is closely linked to technique stability and accuracy.

From an applied perspective, these findings support the use of individualised, bilateral ROM profiling as part of technical and physical monitoring in elite karate. Marked and consistent side-to-side asymmetry, while functionally expected in a unilateral striking technique, may also carry implications for injury-risk screening and for prescribing targeted mobility or strengthening work for the non-dominant side.

LIMITATIONS

As a single-case study (n = 1), these findings describe one elite athlete's technique and cannot be generalised to karate populations as a whole. Data were collected during a single testing session without repeated trials, and no direct comparison group (e.g., male karateka, lower-level athletes, or the same athlete performing a different kicking technique) was included. Ground reaction force and temporal (timing) data were not reported here and would strengthen interpretation of the observed ROM asymmetries in future work.

CONCLUSION

This case study provides a detailed, joint-by-joint ROM profile of an elite female karateka performing ura mawashi geri, revealing pronounced left-right asymmetry at the elbow, shoulder, hip and knee alongside small, symmetrical trunk and neck excursion. These results illustrate the unilateral, rotation-dependent demand of the technique and support the value of individualised 3D ROM assessment for technical and physical preparation monitoring in elite karate. Future research should extend this approach to larger samples and multiple trials to establish normative bilateral ROM benchmarks for ura mawashi geri.

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TWO-PHASE KINEMATIC ANALYSIS OF THE URA MAWASHI GERI: FROM PREPARATORY STANCE TO KICK COMPLETION IN AN ELITE FEMALE KARATEKA

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Abstract

Background: Ura mawashi geri is a rotational, high-amplitude karate kick whose execution requires a rapid transition from a stable preparatory stance to a whip-like striking configuration. Objective: To quantify, and compare, the full-body joint kinematics of an elite female karateka at two discrete phases of ura mawashi geri execution - an initial preparatory (guard) posture and the completed kick (near-impact) posture - using synchronous three-dimensional motion capture. Methods: A single elite female karate athlete was recorded with a 19-point marker set at 240 Hz using an optoelectronic 3D motion analysis (3DMA) system. Two frames were extracted for analysis: frame 11440 (preparatory phase, session time 47.159 s) and frame 11605 (completion phase, session time 48.084 s), 165 frames (0.69 s) apart. Joint angles at the neck, trunk, shoulders, elbows, hips, knees and ankles, together with centre-of-gravity (COG) position, were compared between phases. Results: The transition was characterised by a large increase in trunk anterior tilt (4 degrees to 69 degrees) and lateral flexion (2 degrees to 62 degrees), marked left knee extension (35 degrees to -19 degrees, Delta -54 degrees) and left ankle plantarflexion (3 degrees to -43 degrees, Delta -46 degrees) on the kicking side, alongside a large increase in right hip flexion (-6 degrees to 54 degrees) and bilateral hip abduction (left +28 degrees, right +40 degrees) on the supporting side. COG rose 163 mm vertically and translated 549 mm anteriorly. Conclusion: The two-phase comparison captures the proximal-to-distal kinetic chain and support-limb repositioning that characterise ura mawashi geri, illustrating how trunk counter-lean, hip abduction and terminal knee-ankle extension combine to project the kicking limb toward the target.

Keywords: *karate; ura mawashi geri; kinematics; 3D motion capture; kinetic chain; case study*

INTRODUCTION

Roundhouse-type kicks, including mawashi geri and its reverse variant ura mawashi geri, are among the most frequently used and technically demanding scoring actions in competitive karate. Their effectiveness depends on the coordinated sequencing of trunk rotation, hip abduction/external rotation, knee extension and ankle orientation, commonly described as a proximal-to-distal kinetic chain in which each segment accelerates the next toward the target.

Recent kinematic and electromyographic comparisons of elite and sub-elite female karateka performing Mawashi Geri Jodan have shown that elite athletes complete the technique in significantly less time, display a smaller vertical centre-of-mass displacement during the striking phase, and achieve a greater hip joint range of motion than sub-elite athletes, indicating that hip mobility and trunk-pelvis control are central to high-level execution.

Earlier biomechanical modelling of the Mawashi Geri Jodan kick has similarly proposed that the coordinated sequencing of hip, thigh, shank and foot velocities, together with the athlete's postural stability, underlies successful technical execution, while comparative work across striking disciplines has shown that expert practitioners achieve comparable kicking outcomes via markedly different joint-coordination strategies. This underlines the value of describing full within-athlete kinematic transitions, rather than relying only on isolated joint values or group averages.

Most published analyses of roundhouse-type kicks report either time-averaged joint angles or discrete peak values, with comparatively few studies contrasting the athlete's posture at the start of the movement against the posture at (or near) target contact within a single trial. Such a two-phase comparison can nonetheless reveal, in a directly interpretable form, which joints contribute most to the movement and how the supporting limb repositions to preserve balance while the kicking limb is projected toward the target.

The present case study therefore aimed to (1) quantify the joint-by-joint kinematic change between a preparatory (guard) phase and a completion (near-impact) phase of ura mawashi geri in an elite female karateka, and (2) interpret the resulting pattern of change in light of the kinetic-chain and support-limb literature on roundhouse-type kicks.

METHODS

Participant

The participant was an elite female karate athlete tested as part of the laboratory's ongoing technical-biomechanical monitoring programme. The athlete had no reported injury at the time of testing and gave informed consent for the assessment and for the anonymised research use of the resulting data, consistent with a single-subject case-study design.

Instrumentation

Data were collected with a multi-camera optoelectronic three-dimensional motion analysis (3DMA) system (STT Systems) tracking a 19-point full-body marker set at a sampling rate of 240 Hz. The system's Metrics Dashboard computed, for each analysed joint and movement plane, the current (instantaneous) angle together with the minimum and maximum angle reached across the full capture session, with left- and right-side values reported separately for all bilateral joints.

Procedure

The athlete executed the ura mawashi geri technique while full-body kinematic data were recorded continuously. Two representative frames were selected for the present analysis: frame 11440 (session time 47.159 s), corresponding to a preparatory guard stance with the trunk upright and both knees flexed, and frame 11605 (session time 48.084 s, 165 frames / 0.69 s later), corresponding to the completion of the kicking action with the kicking leg elevated and the trunk inclined toward the supporting side. Instantaneous joint angles at the neck, trunk, shoulders, elbows, hips, knees and ankles, as well as

three-dimensional centre-of-gravity (COG) position, were extracted from the system dashboard at both frames.

Data Analysis

Data are reported descriptively, as a single-case comparison between the two phases. For each joint and plane, the change (Delta) between the completion and preparatory phase was calculated as completion value minus preparatory value. Session minimum and maximum values (recorded across the full capture, not limited to the two analysed frames) are reported alongside the two-phase comparison to contextualise how close each phase came to the athlete's overall recorded range for that trial.

Results

Figures 1 and 2 show the athlete's posture at the preparatory phase (frame 11440) and completion phase (frame 11605), respectively. Table 1 presents the full joint-by-joint comparison, and Table 2 the corresponding centre-of-gravity displacement.

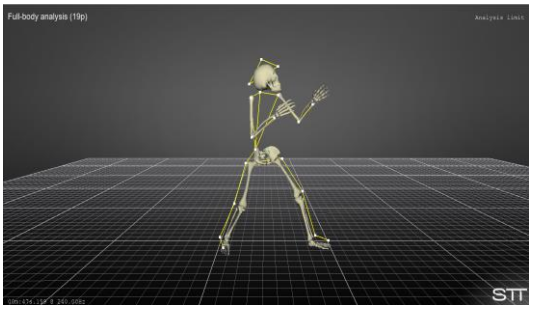

Figure 1. Preparatory phase - frame 11440, t=47.159 s.

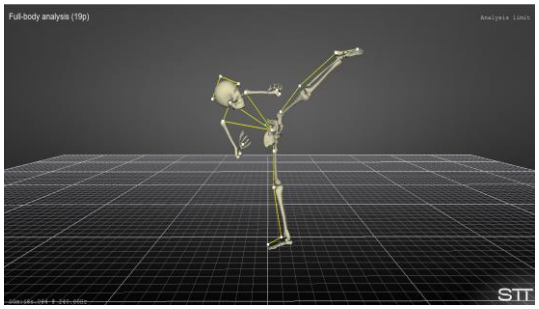

Figure 2. Completion phase - frame 11605, t=48.084 s.

Segment	Movement / Plane	Side	Prep. phase (°) t=47.159 s	Completion (°) t=48.084 s	Δ (°)	Session Min (°)	Session Max (°)
Neck	Flexion[+]/Extension[-]	—	-26	30	+56	0	0
Neck	Lateral flexion R[+]/L[-]	—	-15	-26	-11	-28	-13
Neck	Rotation R[+]/L[-]	—	-58	-73	-15	0	-48

Segment	Movement / Plane	Side	Prep. phase (°) t=47.159 s	Completion (°) t=48.084 s	Δ (°)	Session Min (°)	Session Max (°)
Trunk	Ant.[+]/Post.[-] tilt	—	4	69	+65	0	0
Trunk	Lateral flexion R[+]/L[-]	—	2	62	+60	0	0
Shoulder	Flexion[+]/Extension[-]	Left	21	-4	-25	26	34
Shoulder	Flexion[+]/Extension[-]	Right	22	-6	-28	-12	10
Shoulder	Abduction[+]/Adduction[-]	Left	52	50	-2	34	52
Shoulder	Abduction[+]/Adduction[-]	Right	72	68	-4	45	0
Elbow	Flexion[+]/Extension[-]	Left	105	105	0	46	0
Elbow	Flexion[+]/Extension[-]	Right	122	126	+4	127	129
Hip	Flexion[+]/Extension[-]	Left	22	22	0	12	43
Hip	Flexion[+]/Extension[-]	Right	-6	54	+60	0	0
Hip	Abduction[+]/Adduction[-]	Left	32	60	+28	9	0
Hip	Abduction[+]/Adduction[-]	Right	25	65	+40	11	0
Knee	Flexion[+]/Extension[-]	Left	35	-19	-54	27	77
Knee	Flexion[+]/Extension[-]	Right	30	11	-19	24	49
Ankle	Dorsal[+]/Plantar[-] flexion	Left	3	-43	-46	19	7
Ankle	Dorsal[+]/Plantar[-] flexion	Right	26	8	-18	2	21

Table 1. Joint kinematic comparison between the preparatory and completion phases of ura mawashi geri.

COG axis	Prep. phase (mm)	Completion (mm)	Δ (mm)
X (medio-lateral)	-93	-129	-36
Y (vertical)	760	923	+163
Z (anterior-posterior)	-567	-18	+549

Table 2. Centre-of-gravity (COG) displacement between the preparatory and completion phases.

The largest changes were recorded at the trunk, which moved from a near-neutral anterior tilt (4 degrees) to a pronounced 69-degree anterior/lateral inclination, and in lateral flexion (2 degrees to 62 degrees). On the kicking (left) side, the knee moved from 35 degrees of flexion to -19 degrees (Delta -54 degrees), indicating near-full extension at completion, while the left ankle moved from a near-neutral 3 degrees to -43 degrees of plantarflexion (Delta -46 degrees). Left hip abduction increased from 32 to 60 degrees (Delta +28 degrees). On the supporting (right) side, hip flexion increased sharply from -6 to 54 degrees (Delta +60 degrees) and hip abduction increased from 25 to 65 degrees (Delta +40 degrees), while the right knee showed a smaller flexion decrease (30 to 11 degrees) and the right ankle a moderate reduction in dorsiflexion (26 to 8 degrees). Upper-limb changes were comparatively small: both shoulders moved toward extension (left -25 degrees, right -28 degrees) while abduction changed little (-2 to -4 degrees), and elbow flexion was essentially unchanged (left 0 degrees, right +4 degrees). The neck and trunk rotation-related values also shifted (neck rotation -58 to -73 degrees), consistent with the head/trunk orienting toward the kicking direction. COG rose 163 mm vertically and translated 549 mm in the anterior-posterior axis, with a smaller 36 mm medio-lateral shift, reflecting the athlete's forward-upward projection during the kick.

DISCUSSION

The pattern of change observed between the preparatory and completion phases is consistent with the proximal-to-distal kinetic-chain organisation reported for roundhouse-type karate kicks. The pronounced increase in right (supporting) hip flexion and bilateral hip abduction, together with the rise in COG height, indicates that the supporting limb extended and the pelvis elevated and rotated to lift and project the kicking leg, in line with modelling work identifying hip-thigh-shank-foot velocity sequencing and postural stability as central to Mawashi Geri Jodan execution.

The near-complete left knee extension (Delta -54 degrees) recorded at the completion frame, combined with a substantial increase in left ankle plantarflexion, is consistent with the terminal 'whip' portion of the kicking action, in which knee extension and ankle orientation contribute the final increment of foot velocity and determine striking-surface alignment at the target. The comparatively small change in left hip abduction relative to the large knee and ankle changes suggests that, by the completion frame captured here, the hip had already reached much of its rotational excursion, with the terminal segments (knee, ankle) contributing the remaining velocity - a pattern broadly compatible with reports that elite karateka achieve greater hip range of motion earlier in the kicking action while limiting vertical centre-of-mass displacement during the striking phase.

The large trunk anterior and lateral inclination (to 69 degrees and 62 degrees, respectively) reflects the counter-lean typically adopted to keep the COG within the base of support as the kicking leg is raised toward head height, and is consistent with descriptions of postural-stability control as a determinant of technical quality in the mawashi-geri family of kicks. The comparatively modest upper-limb changes (small shoulder extension, near-unchanged elbow flexion) suggest that, in this athlete, the arms were used mainly for guard maintenance and balance rather than as active contributors to the kicking action, which is consistent with the technique's lower-limb-dominant kinetic chain.

The 549 mm anterior COG translation over 0.69 s (approximately 0.8 m/s average horizontal COG velocity) together with the 163 mm vertical rise indicates a combined forward-and-upward drive typical of a kick directed at a mid-to-high target, matching the general kinematic description of Mawashi Geri Jodan as a technique requiring both horizontal closing distance and vertical elevation of the striking limb.

Limitations

This analysis is based on two discrete frames rather than a continuous phase-by-phase decomposition of the full kicking motion, so intermediate events (e.g., peak angular velocity, exact ground contact/toe-off timing) could not be characterised. As a single-case design (n = 1, one trial), the findings describe this athlete's technique on this occasion and should not be generalised without further sampling across trials and athletes. Ground reaction force and electromyographic data were not collected, limiting kinetic (as opposed to kinematic) interpretation of the observed joint changes.

CONCLUSION

Comparing the preparatory and completion phases of ura mawashi geri in a single elite female karateka revealed a coherent proximal-to-distal kinematic pattern: supporting-limb hip extension and abduction combined with pelvic/trunk counter-lean to elevate the centre of gravity, while the kicking-side knee and ankle contributed the terminal extension and plantarflexion associated with foot-velocity generation. This two-phase, whole-body comparison offers a practical, directly interpretable complement to continuous kinematic analysis for technical monitoring of roundhouse-type kicks in elite karate, and future work should extend it to multiple trials and athletes to establish normative phase-to-phase kinematic benchmarks for ura mawashi geri.

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SURUNKALI BUYRAK KASALLIGI BO'LGAN BOLALARDA CHAP QORINCHA GIPERTROFIYASINING UCHRASH CHASTOTASI VA DAVO REJASI

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NMedical klinikasi va RONS Uz laboratoriya vrachi:

Annotasiya. *Ushbu tadqiqot doirasida 2026-yilda Bolalar Milliy Tibbiyot Markazida surunkali buyrak kasalligi (SBK) tashxisi bilan statsionar davolangan bolalarning kasallik tarixlari retrospektiv tahlil qilindi. Yurak-qon tomir faoliyatining tuzilmaviy va funksional ko‘rsatkichlari hamda ularning SBKning turli bosqichlaridagi darajasi baholandi. Tadqiqot davomida kasallikning 3–5-bosqichlarida bo‘lgan bolalarda yurak-qon tomir tizimi tomonidan o‘zgarishlar, xususan, chap qorincha gipertrofiyasi uchrash chastotasi o’rganildi.*

Abstract. *This study involved a retrospective analysis of the medical histories of children hospitalized with a diagnosis of chronic kidney disease (CKD) at the National Children's Medical Center in 2026. Structural and functional parameters of cardiovascular activity and their values at various stages of CKD were assessed. The study examined the incidence of cardiovascular system changes, specifically left ventricular hypertrophy, in children with stages 3–5 of the disease.*

Kalit so’zlar*: surunkali buyrak kasalligi,chap qorincha gipertrofiyasi,bolalar,aritmiyalar,arterial gipertenziya*

Keywords*:chronic kidney disease, left ventricular hypertrophy,children, arrhythmia, arterial hypertension*

KIRISH

Chap qorincha gipertrofiyasi – bu chap qorincha miokardi massasining ortishi bo‘lib, uning devorlari qalinlashishi va (yoki) bo‘shlig‘i kengayishi bilan kechadi. Ushbu patologiyaning sabablari birlamchi va ikkilamchi arterial gipertenziya, klapanlar apparati nuqsonlari, kardiomiopatiya hamda infiltrativ kasalliklarni o‘z ichiga oladi. Ma’lumki, chap qorincha gipertrofiyasi (ChQG) aritmiya, to‘satdan o‘lim va yurak yetishmovchiligi kabi holatlarning muhim xavf omili hisoblanadi. ChQG va uning geometriyasining o‘zgarishi buyrak funksiyasi saqlangan, shuningdek, surunkali buyrak yetishmovchiligining (SBY) turli bosqichlarida bo‘lgan bemorlarda umumiy aholiga nisbatan 20-30 barobar ko‘proq aniqlanadi. Aynan shu holat mazkur bemorlarda yurak-qon tomir kasalliklaridan o‘lim xavfining yuqori bo‘lishini belgilab beradi. Ushbu tadqiqotdan maqsad – konservativ davo olayotgan, dializgacha bo‘lgan SBYli bemor bolalarda ChQGning yaqqolligi va xususiyatlarini o‘rganishdan iborat edi. Chap qorincha gipertrofiyasi – bu chap qorincha miokardi massasining ortishi bo‘lib, uning devorlari qalinlashishi va (yoki) bo‘shlig‘i kengayishi bilan kechadi. Ushbu patologiyaning sabablari birlamchi va ikkilamchi arterial gipertenziya, klapanlar apparati nuqsonlari, kardiomiopatiya hamda infiltrativ kasalliklarni o‘z ichiga oladi. Asosiy belgilari: jismoniy zo‘riqish paytida hansirash, yurak faoliyatida uzilishlar sezish, bosh aylanishi, ko‘krakda noqulaylik va og‘riqlar.

Maqsad va vazifalar. surunkali buyrak kasalligi (SBK) rivojlanishining turli bosqichlarida buyrak patologiyasiga chalingan bolalarda yurak-qon tomir tizimidagi o‘zgarishlar,xususan, chap qorincha gipertrofiyasi xarakterini baholash.

Metodika. Tadqiqot davomida 2026-yil yanvar-iyul oylari mobaynida surunkali buyrak kasalligi tashxisi bilan BMTMga yotqizilgan 1 yoshdan 17 yoshgacha bo‘lgan 50 nafar bolaning (shulardan 28 nafari (56%) o‘g‘il bola, 22 nafari (44%) qiz bola) kasallik tarixi tahlil qilindi.

Tashxis EKG, Exokardiografiya, yurak MRTsi va laboratoriya tahlillari, xususan qondagi kalmodulin oqsili miqdoriy ko'rsatkichi ma'lumotlariga asoslandi. O'tkazilgan barcha tekshiruvlar natijasida 50nafar bemor boladan 40(80%) nafarida (SBK 3-5 bosqichida bo'lgan bolalar)ning barchasida ma'lum darajadagi chap qorincha gipertrofiyasi aniqlandi. Uning asorati sifatida esa, Aritmiyalar 10(20%), yurak yetishmovchilik holatlari: hansirash 5(10%), qon bosimining oshishi 25(50%), holsizlik 25(50%), taxikardiya 15(30%) kuzatiladi.Davolash asosiy kasallikni korreksiyalash, dori-darmonlar yordamida kardioproteksiya qilish va o'zgartirilishi mumkin bo'lgan xavf omillarini bartaraf etishni o'z ichiga oladi.

Birinchi tanlov preparatlari sifatida: APF ingibitorlari (enalapril 0.08mg/kg/kun, lizinopril); Angiotenzin II reseptorlari blokatorlari (losartan-0.7mg/kg/kun); zarurat bolsa, kalsiy kanali blokatorlari (amlodipin-0.1mg/kg/kun), beta-blokatorlar va diuretiklar bilan davo o'tkazildi.

Undan tashqari bemorlarda suyuqlik yuklamasini kamaytirish(tuz miqdorini cheklash, suyuqlik balansini nazorat qilish), Anemiyani bartaraf etish (temir preparatlari, eritropoezni stimullovchi davo), minerallar almashinuvi buzilishini tuzatish chora-tadbirlari ko'rildi.

XULOSA

Ushbu tadqiqot chap qorincha gipertrofiyasi buyrak funksiyasi buzilishi yoki buyrak yetishmovchiligining terminal bosqichida bo'lgan bolalarda tez-tez uchraydigan holat ekanligini ko'rsatadi.. Transtorakal exokardiografiyada chap qorincha gipertrofiyasi va chap qorincha massasi indeksining oshishi aniqlanishi chap qorincha gipertrofiyasiga sabab bo'lishi mumkin bo'lgan barcha tuzatish mumkin bo'lgan omillarni, xususan, anemiya, semizlik va gipertenziyani sinchkovlik bilan baholashni talab etadi. Buyrak kasalligi bor bolalar o'rtasidan erta yurak-qon tomir kasalliklari va o'lim darajasida yurak qon-tomir tizimi o'zgarishlari,xususan, chap qorincha massasi indeksining oshishi qanchalik

ahamiyatli ekanini aniqlash uchun hozirda olib borilayotgan istiqbolli uzoq muddatli kuzatuv tadqiqotlari talab qilinadi.

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УЎК: 616.5-003.921-089.844-07

ПАТОЛОГИК ЧАНДИҚЛАРНИ ДАВОЛАШДА ФОТОДИНАМИК ТЕРАПИЯ ВА ЛАЗЕР ТЕХНОЛОГИЯЛАРИНИНГ САМАРАДОРЛИГИ

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Аннотация: *Патологик чандиқлар замонавий реконструктив ва пластик хирургиянинг долзарб тиббий-ижтимоий муаммоларидан бири ҳисобланади[1]. Уларнинг шаклланиши нафақат косметик нуқсонларни келтириб чиқаради, балки оғриқ синдроми, қичишиш, ҳаракат функциясининг чекланиши, тўқималар деформацияси ва беморлар ҳаёт сифати пасайишига сабаб бўлади[2,3]. Айниқса, гипертрофик ва келоид чандиқлар юқори рецидивланиш хусусияти билан ажралиб туради ва уларни даволашда қўлланилаётган анъанавий усулларнинг самарадорлиги ҳар доим ҳам қониқарли эмас. Сўнгги йилларда патологик чандиқларнинг ривожланишида ангиогенез, микроциркуляция бузилишлари ҳамда фибробластлар фаоллигининг ортиши муҳим патогенетик омиллар сифатида қаралмоқда[2,3,4]. Шу муносабат билан ушбу жараёнларга мақсадли таъсир кўрсатиш имконини берувчи фотодинамик терапия ва лазер технологияларини амалиётга жорий этиш алоҳида аҳамият касб этмоқда. Мазкур мақолада патологик чандиқларнинг клиник хусусиятлари, ташхислаш мезонлари ҳамда уларни даволашда фотодинамик терапия ва лазер технологияларини комплекс қўллашнинг замонавий имкониятлари ёритилган[1,5].*

Калит сўзлар: *патологик чандиқлар, гипертрофик чандиқлар, келоид чандиқлар, фотодинамик терапия, лазер технологиялари, ангиогенез, реконструктив хирургия.*

Аннотация: *Патологические рубцы остаются одной из наиболее актуальных проблем современной реконструктивной и пластической хирургии[1]. Их*

формирование сопровождается не только возникновением выраженных косметических дефектов, но и развитием функциональных нарушений, ограничением подвижности, болевым синдромом, зудом и снижением качества жизни пациентов[2,3]. Особую сложность представляют гипертрофические и келоидные рубцы, характеризующиеся склонностью к прогрессированию и высокой частотой рецидивов после лечения. Несмотря на значительное количество существующих методов коррекции рубцовых деформаций, проблема достижения стойкого клинического результата остаётся окончательно нерешённой[2,3,4]. Современные представления о патогенезе патологических рубцов свидетельствуют о важной роли нарушений ангиогенеза, микроциркуляции и процессов ремоделирования соединительной ткани. В связи с этим всё большее внимание уделяется внедрению технологий, способных воздействовать на основные звенья патологического процесса. В статье представлены современные данные о клинических особенностях патологических рубцов, возможностях их диагностики и перспективах применения фотодинамической терапии и лазерных технологий в составе комплексного лечения[1,5].

Ключевые слова: *патологические рубцы, гипертрофические рубцы, келоидные рубцы, фотодинамическая терапия, лазерные технологии, ангиогенез, реконструктивная хирургия.*

Abstract: *Pathological scars remain one of the most important challenges in modern reconstructive and plastic surgery[1]. Their development is associated not only with significant aesthetic defects but also with functional impairment, restricted mobility, pain, pruritus, tissue deformation, and a reduced quality of life[2,3]. Hypertrophic and keloid scars are particularly problematic because of their tendency toward progression and recurrence after treatment. Despite the wide range of available therapeutic approaches, achieving stable long-term clinical outcomes remains a major challenge. Current evidence suggests that pathological angiogenesis, microcirculatory disturbances, and abnormal connective tissue remodeling play a crucial role in scar formation and progression[2,3,4]. Therefore, increasing attention has been directed toward treatment modalities capable of targeting the key pathogenetic mechanisms involved in scar development. This article discusses current concepts regarding the clinical characteristics of pathological scars, diagnostic approaches, and the potential role of photodynamic therapy and laser technologies in comprehensive scar management[1,5].*

Keywords: *pathological scars, hypertrophic scars, keloid scars, photodynamic therapy, laser technologies, angiogenesis, reconstructive surgery.*

КИРИШ

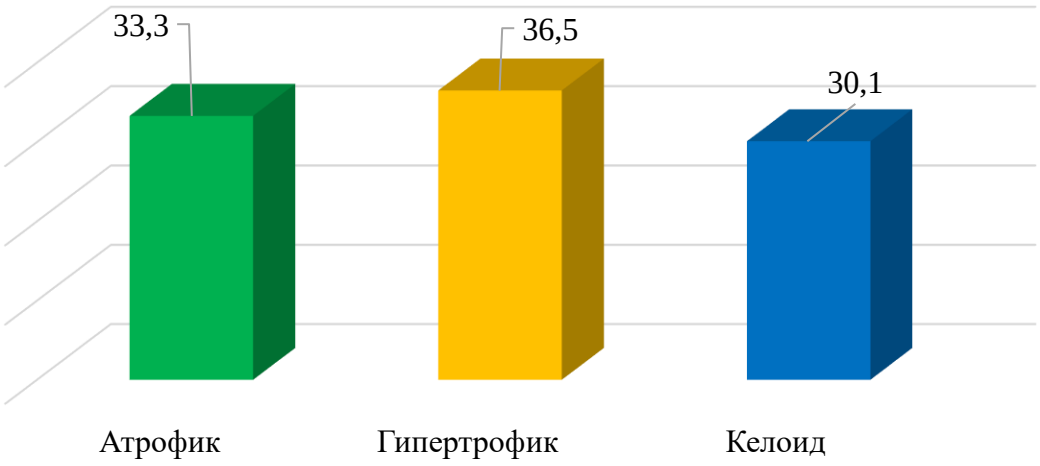
Патологик чандиқлар реконструктив ва пластик хирургиянинг энг долзарб муаммоларидан бири ҳисобланади. Улар ташқи кўринишнинг бузилиши, ҳаракат функциясининг чекланиши, оғриқ синдроми, қичишиш ва психоэмоционал ноқулайлик билан кечади. Жаҳон соғлиқни сақлаш ташкилоти маълумотларига кўра, ҳар йили миллионлаб беморларда жароҳатлар, куйишлар ва хирургик аралашувлардан кейин патологик чандиқлар шаклланади. Гипертрофик ва келоид чандиқларнинг юқори рецидив бериш хусусияти мавжуд бўлиб, бу уларни даволашда янги технологияларни жорий этишни талаб этади Сўнгги йилларда фотодинамик терапия ва турли лазер технологиялари патологик чандиқларни даволашда истиқболли усул сифатида қаралмоқда. Ушбу усуллар патологик ангиогенезни сусайтириш, фибробластлар фаоллигини камайтириш ва коллаген ремоделизациясини яхшилаш имконини беради

Тадқиқот мақсади: Патологик чандиқларни даволашда фотодинамик терапия ва лазер технологияларининг клиник самарадорлигини баҳолаш.

Материал ва усуллар:Тадқиқот Республика шошилинч тиббий ёрдам илмий маркази Бухоро филиали, В.Воҳидов номидаги Республика ихтисослаштирилган хирургия илмий-амалий тиббиёт маркази ҳамда «RS Laser Clinic» клиникаларида 2023–2026 йиллар давомида ўтказилди. Тадқиқотга патологик чандиқлари мавжуд бўлган 189 нафар бемор киритилди. Беморларнинг 97 нафари (51,3%) эркаклар ва 92 нафари (48,7%) аёллардан иборат бўлди. Беморларнинг асосий қисмини меҳнатга лаёқатли ёшдаги шахслар ташкил қилди.Чандиқларнинг морфологик хусусиятларига кўра беморлар қуйидагича тақсимланди:

- атрофик чандиқлар – 63 нафар (33,3%);

- гипертрофик чандиқлар – 69 нафар (36,5%);
- келоид чандиқлар – 57 нафар (30,1%).



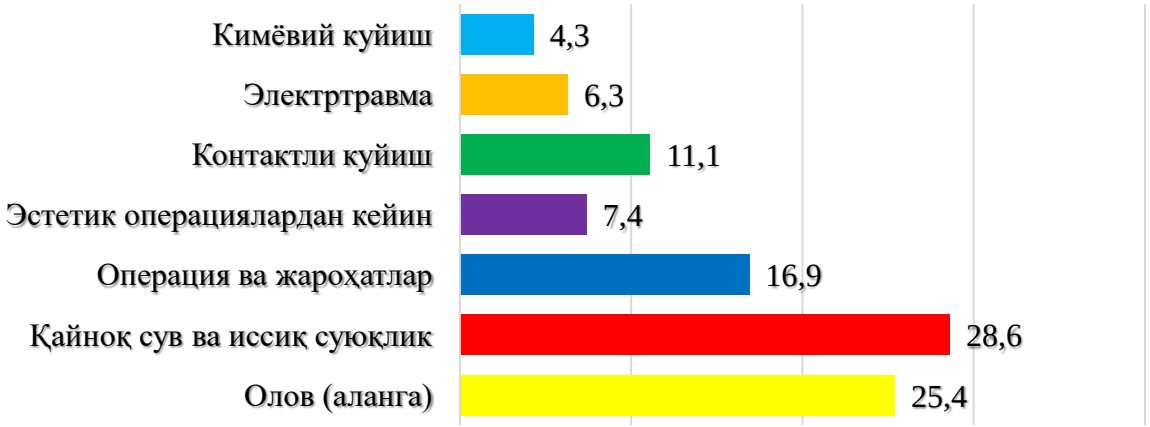
Расм 1.

Беморларнинг чандиқ турлари бўйича тақсимланиши.

Барча беморларда даволашнинг биринчи босқичида патологик чандиқ тўқимасини хирургик эксцизия қилиш амалга оширилди. Лазер терапияси босқичида фракцион CO_2 лазер (10600 нм) ҳамда сариқ лазер (577–585 нм) қўлланилди. CO_2 лазер патологик фиброз тўқимани абляция қилиш ва чандиқ релефини текислаш мақсадида ишлатилди. Сариқ лазер эса патологик ангиогенезни камайтириш ва микроциркуляцияни яхшилаш учун қўлланилди.Фотодинамик терапия жараёнида фотосенсибилизатор қўлланилиб, белгиланган экспозициядан кейин махсус нур манбаи орқали фотодинамик таъсир амалга оширилди. Клиник баҳолаш учун Vancouver Scar Scale (VSS), Patient and Observer Scar Assessment Scale (POSAS) ва Manchester Scar Scale (MSS) шкалаларидан фойдаланилди.

Натижалар: Тадқиқот давомида патологик чандиқлар ривожланишида патологик ангиогенез муҳим патогенетик омил эканлиги аниқланди. Қон томирлар зичлиги ошиши чандиқ оғирлиги ва клиник кўринишининг ёмонлашиши билан узвий боғлиқ эканлиги қайд этилди. Чандиқларнинг этиологик таҳлили натижалари уларнинг асосий қисми

жарроҳлик аралашувлари, куйишлар ва механик жароҳатлар оқибатида шаклланганлигини кўрсатди.



Расм 2. Беморларнинг чандиқ этиологияси бўйича тақсимланиши.

Клиник баҳолашда POSAS шкаласи патологик чандиқларни баҳолаш учун энг юқори информативликка эга эканлиги аниқланди.

Кузатувчи қисми			
Кўрсаткичлар	**Атрофик**	**Гипертрофик**	**Келоид**
Васкуляризация	1,84±0,48	6,62±0,4	9,35±0,74
Пигментация	2,46±0,77	6,81±0,35	8,8±0,63
Қалинлик	3,35±0,62	7,61±0,28	9,71±0,67
Релеф	3,8±0,59	6,7±0,4	9,52±0,6
Эластиклик	3,15±0,54	7,42±0,35	9,8±0,54
Юза майдони	1,93±0,24	6,88±0,4	9,31±0,82
Бемор қисми			
Оғриқ	1,76±0,49	4,81±0,42	4,21±0,64
Қичишиш	2,47±0,53	5,36±0,54	4,21±0,64
Ранги	4,2±0,62	6,26±0,56	8,57±0,9
Қаттиқлик	4,11±0,62	6,5±0,58	9,12±0,6
Қалинлик	3,88±0,65	6,18±0,4	9,75±0,43

Жадвал 3.

POSAS шкаласи бўйича баҳолаш натижалари.

Комплекс даволашдан кейин гипертрофик чандиқларда VSS кўрсаткичлари ўртача 42% га яхшиланди. Келоид чандиқларда мазкур кўрсаткич 37,9% ни ташкил қилди. Асосий гуруҳда яра эпителизацияси 5–7 кун ичида кузатилди. Назорат гуруҳларида ушбу кўрсаткич 21–28 кунни ташкил қилди. Кутометрия натижалари асосий гуруҳда тери эластиклиги сезиларли даражада яхшиланганлигини кўрсатди.

Даражалар	**Атрофик**	**Гипертрофик**	**Келоид**	**Назорат гуруҳи**
Умумий эластиклик	0,46±0,06	0,42±0,04	0,32±0,02	0,82±0,06
Соф эластиклик	0,41±0,05	0,31±0,02	0,28±0,02	0,65±0,05
Биологик эластиклик	0,34±0,03	0,27±0,02	0,24±0,03	0,54±0,04
Вискоэластиклик (суюқлик/шиш)	0,44±0,06	0,58±0,04	0,62±0,03	0,38±0,04

Жадвал 4.

Кутометрия кўрсаткичлари динамикаси.

Комплекс даволашдан кейин чандиқ майдони ўртача 33% га камайди. Морфологик таҳлилларда коллаген толаларининг тартибли жойлашиши ва патологик томирланишнинг камайиши қайд этилди.

ХУЛОСА

Патологик чандиқлар ривожланишида патологик ангиогенез муҳим патогенетик омил ҳисобланади. CO_2 лазер, 585 нм сариқ лазер ва фотодинамик терапияни ўз ичига олган комплекс даволаш усули патологик чандиқларни даволашда юқори самарадорлик кўрсатди. Комплекс даволаш яра битиш муддатини 21–28 кундан 5–7 кунгача қисқартириш имконини берди. Гипертрофик чандиқларда клиник яхшиланиш 42%, келоид чандиқларда эса 37,9% ни ташкил қилди. POSAS шкаласи патологик чандиқларни баҳолашда энг юқори диагностик аҳамиятга эга бўлди.

Фотодинамик терапия ва лазер технологияларини биргаликда қўллаш рецидивларнинг олдини олиш ва косметик натижаларни яхшилаш имконини беради.

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KUYDIRGI (SIBIR YARASI) KASALLIGI PROFILAKTIKASI VA EPIDEMIOLOGIK NAZORAT: ADABIYOTLAR SHARHI

Axmatova Munisa Azamat qizi

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KIRISH

Kuydirgi (lot. Anthrax, ruscha Сибирская язва) — o‘ta xavfli, zoonoz tabiatga ega bo‘lgan yuqumli kasallik bo‘lib, asosan qishloq xo‘jalik hayvonlari va odamlar orasida uchraydi. Ushbu kasallik qadim zamonlardan beri ma’lum bo‘lib, tarixiy manbalarda ham ko‘plab epidemiyalar sababchisi sifatida qayd etilgan. Hozirgi kunda ham kuydirgi global sog‘liqni saqlash tizimi uchun dolzarb muammo bo‘lib qolmoqda.

Kuydirgi kasalligi yuqori letallik darajasi, qo‘zg‘atuvchisining tashqi muhitda juda uzoq muddat saqlanishi hamda kasallikning tez va og‘ir kechishi bilan ajralib turadi. Ayniqsa, kasallikning o‘pka va septik shakllari qisqa vaqt ichida og‘ir asoratlar va o‘limga olib kelishi mumkin. Shu sababli kuydirgi "o‘ta xavfli infeksiyalar" guruhiga kiritilgan.

Zamonaviy tibbiyotda kuydirgini erta aniqlash, o‘z vaqtida davolash va oldini olish choralarini ko‘rish muhim ahamiyatga ega. Ushbu maqolada kuydirgi kasalligining etiologiyasi, epidemiologiyasi, patogenezi, klinik ko‘rinishlari, diagnostikasi, davolash va profilaktikasi ilmiy adabiyotlari asosida keng yoritilgan.

ВВЕДЕНИЕ

Сибирская язва (лат. Anthrax) — особо опасное инфекционное заболевание зоонозной природы, которое преимущественно поражает

сельскохозяйственных животных и человека. Данное заболевание известно с древних времён и в исторических источниках неоднократно упоминалось как причина многочисленных эпидемий. В настоящее время сибирская язва остаётся актуальной проблемой для глобальной системы здравоохранения.

Сибирская язва характеризуется высокой летальностью, способностью возбудителя длительное время сохраняться во внешней среде, а также быстрым и тяжёлым течением заболевания. Особенно опасны лёгочная и септическая формы, которые в короткие сроки могут приводить к тяжёлым осложнениям и летальному исходу. В связи с этим сибирская язва относится к группе «особо опасных инфекций».

В современной медицине большое значение имеет ранняя диагностика сибирской язвы, своевременное лечение и проведение профилактических мероприятий. В данной статье на основе научной литературы подробно освещены этиология, эпидемиология, патогенез, клинические проявления, диагностика, лечение и профилактика сибирской язвы.

INTRODUCTION

Anthrax (Latin: Anthrax, Russian: Sibirskaya yazva) is an extremely dangerous infectious disease of zoonotic nature that primarily affects agricultural animals and humans. This disease has been known since ancient times and has been recorded in historical sources as the cause of numerous epidemics. Even today, anthrax remains a pressing problem for the global healthcare system.

Anthrax is characterized by a high lethality rate, the long-term persistence of its causative agent in the external environment, and the rapid and severe course of the disease. In particular, the pulmonary and septic forms of the disease can lead to severe complications and death within a short period of time. For this reason, anthrax is classified as an “especially dangerous infection.”

In modern medicine, early detection of anthrax, timely treatment, and the implementation of preventive measures are of great importance. This article provides a comprehensive overview of the etiology, epidemiology, pathogenesis, clinical manifestations, diagnosis, treatment, and prevention of anthrax based on scientific literature.

Etiologiyasi

Kuydirgi kasalligining qo‘zg‘atuvchisi — Bacillus anthracis bo‘lib, grammusbat, harakatsiz, tayoqchasimon bakteriyadir. U aerob sharoitda yaxshi o‘sadi, oddiy oziqa muhitlarida koloniyalar hosil qiladi. Mikroorganizmdan tashqi muhitda saqlanib qolish imkonini beruvchi muhim xususiyat — spora hosil qilish qobiliyatidir.

Bacillus anthracis sporalarining chidamliligi juda yuqori bo‘lib, ular tuproqda, suvda va hayvon mahsulotlarida o‘nlab yillar davomida saqlanishi mumkin. Rus adabiyotlarida ayrim hududlarda sporalar 40–50 yilgacha hayotiy faolligini saqlab qolishi qayd etilgan. Bakteriyaning yana bir muhim patogenlik omili — polipeptid kapsula bo‘lib, u mikroorganizmlarni fagotsitozdan himoya qiladi.

Qo‘zg‘atuvchi ekzotoksin ishlab chiqaradi. Ushbu toksinlar organizmda umumiy intoksikatsiya, to‘qimalarning nekrozi va gemorragik jarayonlarni yuzaga keltiradi.

[Etiologiya bo‘limi: 1, 3, 4, 5]

Epidemiologiyasi

Kuydirgi tabiiy-o‘choqli infeksiya hisoblanadi. Kasallikning asosiy manbai — kasallangan yoki kuydirgidan nobud bo‘lgan qishloq xo‘jalik hayvonlari (qo‘y, qoramol, echki, ot, tuya). Infeksiya hayvonlardan odamlarga bevosita yoki bilvosita yo‘l bilan yuqadi.

Odamlarga kasallik asosan kasallangan hayvonlarni parvarishlash, so‘yish, terisini shilish, go‘shtini qayta ishlash jarayonida yuqadi. Shuningdek, kuydirgi sporalarining chang bilan nafas yo‘llari orqali tushishi yoki ifloslangan oziq-ovqat mahsulotlari iste’moli orqali ham infeksiya yuqishi mumkin.

Kasallik ko‘proq qishloq joylarda, chorvachilik rivojlangan hududlarda uchraydi. Mavsumiylik xususiyatiga ega bo‘lib, bahor va yoz oylarida kasallanish holatlari ko‘payadi. Bu davrda chorva mollari yaylovga chiqarilishi va tuproq bilan aloqa kuchayishi infeksiya tarqalishiga qulay sharoit yaratadi.

Rossiya, Markaziy Osiyo va Kavkaz hududlarida kuydirgining tabiiy o‘choqlari mavjudligi ilmiy adabiyotlarda ko‘p bor ta’kidlangan. Ayrim hududlarda kasallik yillar davomida saqlanib qolgan tuproq o‘choqlari bilan bog‘liq ekani aniqlangan.

[Epidemiologiya bo‘limi: 2, 6, 7]

Patogenezi

Infeksiya odam organizmiga uch xil asosiy yo‘l bilan kiradi: teri orqali, nafas yo‘llari orqali va ovqat hazm qilish tizimi orqali. Kirish darvozasida Bacillus anthracis sporalaridan vegetativ shakllar rivojlanib, mahalliy yallig‘lanish jarayoni yuzaga keladi.

Teri orqali kirganda avval mahalliy infiltratsiya, shish va giperemiya paydo bo‘ladi. Keyinchalik bakteriyalar limfa tomirlari orqali regional limfa tugunlariga, undan esa qon oqimiga tushib, butun organizmga tarqaladi.

Kuydirgi qo‘zg‘atuvchisining asosiy patogenlik omili — ekzotoksin bo‘lib, u uch komponentdan iborat. Ushbu toksinlar qon tomirlar o‘tkazuvchanligini oshiradi, kuchli shish, gemorragiyalar va to‘qimalar nekrozini keltirib chiqaradi. Og‘ir hollarda umumiy intoksikatsiya va sepsis rivojlanadi. O‘pka va ichak shakllarida patogen jarayon tez rivojlanib, qisqa vaqt ichida hayot uchun xavfli holatga olib keladi.

[Patogenez bo‘limi: 3, 5, 8]

Klinik shakllari

Inkubatsion davr muddati bir necha soatdan bir necha kungacha bo’lishi mumkin, ko’pincha 2-3 kun oralig’ida o’zgarib turadi. Kasallik lokalizatsiyalangan (teri) yoki generalizatsiyalangan (o’pka, ichak va septik) shaklda kechishi mumkun.

Kuydirgi klinik jihatdan bir nechta shaklda namoyon bo‘ladi:

Teri shakli — eng ko‘p uchraydigan turi. Avval qizarish, so‘ng pufakcha va qora rangli yara (karbunkul) hosil bo‘ladi.

Kuydirgining teri shakli

Bu kuydirgi kasalligi holatlarining 98-99 foizida kuzatiladi. Uning eng keng tarqalgan shakli karbunkulyar shaklidir, kamroq tarqalganlari kasallikning edematoz, bullyoz va erizipeloid shakllari. Ko'pincha tananing ochiq qismlari shikastlanadi; karbunkullar bosh, bo'yin, burun va og'izning shilliq qavatida joylashganida kasallik ayniqsa og'ir kechadi.

Kuydirgi infektsiyasining generalizatsiyasi klinikasi shaklidan (teri yoki vistseral) qat'iy nazar, kasallikning boshlang'ich davrining terminal bosqichida namoyon bo'lishlarning turfaligi bir xil: u konsentratsiyasi 1mm3 qonda yuz ming va hatto millionlab bakterial hujayrasi bo'lgan kuydirgi bakteriyalarining periferik qonga chiqishi bilan kechadi.

Bunday konsentratsiya esa kuydirgili sepsis deb qaralishi mumkin va o'zi bilan infektsion-toksik shok klinikasini taqdim qiladi. Bu qonning koagulyatsion (ivish) va antikoagulyatsion tizimining jiddiy buzilishlari, atsidoz, o'tkir buyrak yetishmovchiligi buyrak-yetishmovchiligi, tana haroratining me'yordan pasayib ketishi, o'ta kuchli intoksikatsiya demakdir.

Odatda karbunkul bitta bo'ladi, biroq ba'zan ularning soni 10-20 yoki undan ko'p bo'lishi mumkin. Infektsiyaning kirish darvozasi joyida ketma-ketlikda dog', papula, vezikula, yara rivojlanadi. Og'riqsiz ko'k-qizg'ish rangli va 1-3 mm diametrli, hasharot chaqishi izini eslatadigan dog', bir necha soat ichida mis-qizg'ish rangli papulaga aylanadi. Qichish va achish hissi kuchayadi.

12-24 soatdan so'ng papula diametri 2-3 mm bo'lgan suyuqlik bilan to'lgan pufakchaga aylanadi, suyuqlik bir muddatdan keyin qorayadi va qonsimon bo'ladi. Qashilaganda (ba'zan esa o'z-o'zidan) pufakcha yoriladi va uning o'rnida to'q jigarrang tagli, chetlari ko'tarilgan va seroz-gemorragik ajralmali yara hosil bo'ladi. Bir sutkadan keyin yara diametri 8-15 mm ga yetadi.

Nekroz natijasida, yaraning markaziy qismida 1-2 hafta o'tgach zich, og'rimaydigan qattiq chaqa hosil bo'ladi va uning atrofi qizil rangli sezilarli yallig'llanishli bolish qayd qilinadi. Tashqi tomondan, qattiq chaqa olovdagi

ko’mirni eslatadi, aynan shu ko’rinish kasallikning nomlanishiga sabab bo’lgan (Antrax — ko’mir). Ushbu shikastlanish karbunkul nomini olgan.

O‘pka shakli — nafas yo‘llari orqali yuqadi, og‘ir intoksikatsiya va nafas yetishmovchiligi bilan kechadi.

Ichak shakli — ifloslangan oziq-ovqat iste’moli natijasida rivojlanadi.

Septik shakl — kasallikning eng og‘ir turi bo‘lib, ko‘pincha o‘lim bilan tugaydi.

[Klinik shakllar bo‘limi: 1, 6, 9]

Diagnostikasi

Kuydirgini aniqlash uchun maxsus laborator tahlillar o‘tkaziladi. Bunga quyidagilar kiradi:

Qon va yara suyuqligini tekshirish: Kasallik bakteriyalarini aniqlash uchun mikroskopik tahlil.

Polimeraza zanjir reaksiyasi (PCR): Bakteriya DNKini aniqlash

Kuydirgi diagnostikasi klinik belgilarning xosligi, epidemiologik anamnez va laborator tekshiruv natijalariga asoslanadi. Bemorning kasbi, hayvonlar bilan aloqasi va yashash hududi muhim ahamiyatga ega.

Laborator diagnostikada bakteriologik usul yetakchi hisoblanadi. Teri yaralaridan olingan material, qon, balg‘am yoki najas namunalarida Bacillus anthracis aniqlanadi. Mikroskopiya, oziqa muhitlariga ekish va serologik reaksiyalar qo‘llaniladi.

Zamonaviy diagnostikada polimeraza zanjir reaksiyasi (PCR) yuqori aniqlikka ega usul sifatida keng joriy etilmoqda. Differensial diagnostika boshqa yiringli-terili kasalliklar, sepsis va ichak infeksiyalari bilan olib boriladi.

[Diagnostika bo‘limi: 4, 10]

Davolash

Kuydirgi bilan kasallangan bemorlar majburiy ravishda infeksion statsionar sharoitda davolanadi. Davolash imkon qadar erta boshlanishi zarur, chunki bu kasallik oqimini yengillashtiradi va asoratlar xavfini kamaytiradi.

Asosiy etiotrop davolash antibiotiklar yordamida olib boriladi. Penitsillinlar, doksisiklin, siprofloksasin va boshqa ftorxinolonlar keng qo‘llaniladi. Og‘ir hollarda bir nechta antibiotiklar kombinatsiyasi tavsiya etiladi.

Bundan tashqari, dezintoksikatsion terapiya, yurak-qon tomir faoliyatini qo‘llab-quvvatlovchi vositalar va simptomatik davolash choralariga katta e’tibor qaratiladi. Zarur hollarda reanimatsion yordam ko‘rsatiladi.

[Davolash bo‘limi: 5, 9, 11]

Oldini olish

Kuydirgining oldini olish veterinariya va tibbiyot xodimlarining hamkorlikdagi faoliyatini talab qiladi. Profilaktikaning asosiy yo‘nalishi — chorva hayvonlarini muntazam emlash va veterinariya-sanitariya nazoratini kuchaytirishdir.

Kasallangan yoki kuydirgidan nobud bo‘lgan hayvonlar maxsus qoidalarga muvofiq yo‘q qilinadi. Ularning go‘shti va terisini iste’mol qilish qat’iyan man etiladi. Tuproq o‘choqlarini dezinfeksiya qilish muhim ahamiyatga ega.

Xavf guruhiga mansub shaxslar (veterinarlar, chorvadorlar, go‘shtni qayta ishlovchi ishchilar) profilaktik emlashdan o‘tkaziladi. Aholi o‘rtasida sanitariya-ma’rifiy ishlar olib borish ham kasallikning oldini olishda muhim rol o‘ynaydi.

[Oldini olish bo‘limi: 2, 7, 12]

Qo‘shimcha ma’lumotlar (tarixiy va amaliy jihatlar)

Kuydirgining tarixiy ahamiyati

Kuydirgi insoniyatga qadim zamonlardan beri ma’lum bo‘lgan kasalliklardan biridir. Tarixiy manbalarda ushbu kasallik chorva mollari orasida ommaviy o‘limga sabab bo‘lgani, natijada iqtisodiy va ijtimoiy muammolarni keltirib chiqargani qayd etilgan. XIX asrda mashhur olim R. Kox tomonidan Bacillus anthracis ning aniqlanishi infeksion kasalliklar rivojida muhim bosqich

bo‘ldi. Aynan kuydirgi misolida "mikroorganizmlar kasallik qo‘zg‘atadi" degan nazariya ilmiy jihatdan isbotlangan.

Rossiya tibbiyot maktabida kuydirgi alohida e’tibor qaratilgan infeksiyalardan biri bo‘lib, uning tabiiy o‘choqlari, tarqalish mexanizmlari va profilaktikasi bo‘yicha ko‘plab fundamental tadqiqotlar olib borilgan. Bu tadqiqotlar zamonaviy epidemiologiya va infektologiya fanining rivojiga katta hissa qo‘shgan.

[Tarixiy ma’lumotlar: 1, 5, 8]

Kuydirgining ijtimoiy va sanitariya ahamiyati

Kuydirgi nafaqat tibbiy, balki ijtimoiy ahamiyatga ega kasallik hisoblanadi. Chorvachilik bilan shug‘ullanadigan hududlarda kasallik tarqalishi aholining daromShuningdek, kasallikning o‘ta xavfli infeksiya sifatida baholanishi sog‘liqni saqlash tizimidan yuqori darajadagi tayyorgarlikni talab qiladi.

Sanitariya-epidemiologiya xizmatlari tomonidan kuydirgi o‘choqlarini doimiy monitoring qilish, kasallik holatlari aniqlanganda tezkor choralar ko‘rish muhim ahamiyatga ega. Ushbu tadbirlar kasallikning keng tarqalishining oldini olishga xizmat qiladi.

[Ijtimoiy ahamiyat bo‘limi: 2, 7, 12]

Kuydurgi (Sibir yarasi) kasalligi statistikasi.

Jahon bo‘yicha

Har yili dunyo bo‘yicha o‘rtacha 2 000 – 5 000 ta kuydurgi holati qayd etiladi

Kasallik asosan Afrika, Osiyo va Sharqiy Yevropa mamlakatlarida uchraydi

Rivojlangan davlatlarda juda kam (sporadik holatlar).

Kuydurgining eng keng tarqalgan shakli — teri shakli

Eng yuqori o‘lim — o‘pka shaklida

Asosan qishloq joylarida va veterinariya nazorati sust hududlarda uchraydi

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5-SECTION

SAVDO VA XIZMAT KO‘RSATISH OBYEKTLARI NOMLARI TASNIFI (CHIRCHIQ SHAHRI MISOLIDA)

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Annotatsiya. *Mazkur tezisda Toshkent viloyati Chirchiq shahridagi ergonimlar tasniflanadi. Tadqiqot natijasida savdo va xizmat ko‘rsatish obyektlari nomlarining qo‘llanish tendensiyalari aniqlangan.*

Kalit so‘zlar: *onomastika, ergonim, emporonim, neyming, tijorat obyektlari, servis obyektlari, xosnom, reklama funksiyasi, Chirchiq.*

Abstract. *This thesis presents a classification of the ergonyms of commercial and service establishments in Chirchiq, Tashkent Region, Uzbekistan. The study identifies the naming trends of commercial and service establishments based on the analysis of their ergonyms. The findings contribute to the linguistic investigation of urban naming practices and the functional characteristics of ergonyms within the field of onomastics.*

Keywords: *onomastics, ergonym, ergonomics, emporonym, naming, commercial establishments, service establishments, proper name, advertising function, Chirchiq.*

KIRISH

So‘nggi yillarda mamlakatimizda yangi ijtimoiy va texnologik hodisalar ta’sirida ko‘plab yangi leksik birliklar shakllanmoqda. Shu sababli, ergonimlar (savdo va xizmat ko‘rsatish obyektlari nomlari) ni tasniflash va ularni o‘rganish zamonaviy til taraqqiyotini anglashda muhim ahamiyat kasb etadi. Bunday nomlar endilikda faqat til hodisasi sifatida emas, balki iqtisodiyot, huquq va marketing sohalari kesimida ham muhim tadqiqot manbayiga aylanib bormoqda. Ushbu tezisning dolzarbligi shundaki, Chirchiq shahridagi savdo va xizmat ko‘rsatish obyektlari nomlari tasnifining ko‘rilishi kelgusida boshqa viloyatlar

va shaharlarning ergonimlar masalasini o‘rganishda muhim ilmiy tadqiqot manbasi vazifasini bajaradi.

Ergonimik makonni tartibga solish, ulardan foydalanishdagi nuqson va kamchiliklarni yuzaga chiqarish, shu bilan birga davlat tili qonunchiligi talablariga to‘g‘ri kelmaydigan nomlarning qay darajada tarqalganini kuzatish o‘zbek onomastika fanining bugungi kundagi muhim yo‘nalishlardan biri hisoblanadi.

ASOSIY QISM

Onomastikaning kichik birligi bo‘lgan ergonimlar masalasi o‘zbek tilshunosligida turli hududlar misolida o‘rganilmoqda. Chirchiq shahridagi tijorat va servis obyektlari peshlavhalarini tasniflash jarayonida klassifikatsiya, struktur (tarkibiy munosabatlarini tahlil qilish), statistik (ma’lumotlarni tahlil qilish va barqaror xususiyatlarini aniqlash), induktiv (dalil, kuzatuv va tajriba) va deduktiv (nazariya yoki qoidalar asosida xususiy xulosa chiqarish) metod[1]lardan foydalanildi. Tadqiqot natijasida emporonim (savdo obyektlari nomlari) lar va servis obyektlari nomlari leksik-semantik, derivatsion, motivatsion, funksional, etimologik, tematik jihatdan tahlil qilinib, ularning reklama va marketing bilan bog‘liq xususiyatlari ham yoritildi.

Tadqiqot doirasida Chirchiq shahridagi savdo va xizmat ko‘rsatish obyektlarining 100 ta ergonimi motivatsion belgilari asosida tahlil qilindi va beshta asosiy guruhga ajratildi. Tahlil natijalariga ko‘ra, shaxs ismlaridan kelib chiqqan antroponimik nomlar 22 % ni, geografik nomlar negizida shakllangan toponimik nomlar 6 % ni tashkil etdi. Obrazli-assotsiativ nomlar, ya’ni mavhum tushunchalar, badiiy timsollar, o‘simlik va hayvonot olami hamda tabiat hodisalari bilan bog‘liq nomlar eng salmoqli guruhlardan biri bo‘lib, ularning ulushi 28 % ga teng bo‘ldi. Obyektning faoliyat yo‘nalishi yoki ko‘rsatilayotgan xizmat turini bevosita ifodalovchi nomlar 15 % ni egalladi. Eng yuqori ko‘rsatkich esa 29 % bilan uyg‘unlashgan (aralash) nomlarga to‘g‘ri keldi.

[1] B,Mengliyev, Sh.Gulyamova. “Dissertatsiya yozish metodikasi”. O‘quv qo‘llanma. Toshkent-2025, 26-28 b

Mazkur guruh tarkibiga ikki yoki undan ortiq motivatsion omilning o‘zaro uyg‘unlashuvi asosida yuzaga kelgan ergonimlar kiritildi.

Ushbu tasnif nomlarning nafaqat til jihatidan tuzilishini, balki ularning ijtimoiy-madaniy va iqtisodiy asosini ham namoyon etadi. Tadqiqot yakunida uyg‘unlashgan (aralash) negizli nomlarning ulushi boshqalarga nisbatan yuqoriroq ekanligi qayd etildi, bu esa hozirgi neyming amaliyotida bir qancha motivatsion omilning bir vaqtning o‘zida ishga solinish tendensiyasini yaqqol tasdiqlaydi. Ergonim endilikda shunchaki obyektni ajratib ko‘rsatish vositasi bo‘libgina qolmasdan, balki xosnomning reklama vazifasini bajaruvchi muhim omilga aylanib bormoqda. Xosnom xaridor ongida obyekt to‘g‘risidagi ilk taassurotni shakllantirib, uni bozordagi boshqa raqiblardan ajratib turadi[2]. Ana shu bois neyming jarayonida nomning eslab qolinishi qulayligi, talaffuz osonligi va assotsiativ yuk ko‘tara olishi kabi jihatlarga alohida e’tibor qaratiladi[3].

Ergonimlarni tartibga solishning muhim jihatlaridan yana biri ularning O‘zbekiston Respublikasining “Davlat tili haqida”gi qonuni va tegishli normativ-huquqiy hujjatlar talablariga to‘liq mos kelishini ta’minlashdan iborat. Amaliyot shuni ko‘rsatadiki, davlat tili me’yorlariga zid, transliteratsiya va imloviy xatolarga yo‘l qo‘yilgan (“Modniki Shop”), shuningdek, asossiz ravishda chet tilida yozilgan nomlar ayrim sohalarda, xususan, umumiy ovqatlanish va kiyim-kechak savdosi yo‘nalishida boshqalarga nisbatan ko‘proq uchraydi. Bu holat aynan shu sohalarda xorijiy bozor ta’siri hamda xalqaro xosnomlarga taqlid qilish tendensiyasining kuchliroq ekanligini tasdiqlaydi.

XULOSA

Savdo va xizmat ko‘rsatish obyektlari nomlarini tizimli tasniflash ularning til tabiatini chuqurroq anglash, ergonimik makondagi mavjud kamchiliklarni aniqlash hamda amaliy tavsiyalar ishlab chiqish imkonini yaratadi. Neym

[2] Superanskaya A.V. Obshchaya teoriya imeni sobstvennogo. — Moskva: Nauka, 1973.
[3] Uluqov N. O‘zbek tili onomastikasi masalalari. — Toshkent, 2010.

shakllantirishda milliy nom tanlashning istiqbolli yo‘llarini belgilash, bir tomondan, o‘zbek tilining boyligi va milliy o‘ziga xosligini asrab qolishga xizmat qilsa, ikkinchi tomondan, zamonaviy marketing va brending talablariga javob beradigan raqobatbardosh nomlar yaratish imkonini beradi.

Xulosa qilib aytganda, hozirgi kunda Chirchiq shahri hududidagi savdo va xizmat ko‘rsatish obyektlari nomlari yetarlicha o‘rganilmagan. Kelajakda ergonimlarning huquqiy jihatdan tartibga solinishi va nazorat mexanizmlarini takomillashtirish masalalari alohida tadqiqot obyekti sifatida chuqurroq o‘rganilishi lozim.

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IMPROVING PARLIAMENTARY OVERSIGHT IN THE LEGISLATIVE CHAMBER OF UZBEKISTAN: INSTITUTIONAL INNOVATIONS FOR SUSTAINABLE GOVERNANCE

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Abstract. *This article examines digital and artificial-intelligence-assisted oversight in the Legislative Chamber of Uzbekistan. Doctrinal legal, documentary, comparative, and institutional analysis identifies information asymmetry, weak public tracking of follow-up, and insufficient enforcement of procedural duties as the main constraints. It proposes a citizen-initiated oversight mechanism, an open oversight register, parliamentary party-group hearings, and a minority rapporteur. AI should support classification, deadline monitoring, and pattern detection only under human supervision, data-protection safeguards, cybersecurity controls, and algorithmic transparency.*

Keywords: *parliamentary oversight, digital parliament, artificial intelligence, accountability, open register.*

INTRODUCTION

Parliamentary oversight is a central mechanism of democratic accountability and sustainable governance. It enables the legislature to verify the implementation of laws, scrutinize public expenditure, and require corrective action. Uzbekistan’s 2023 Constitution strengthened the Legislative Chamber: Articles 93 and 94 address important budgetary and institutional competences, while Article 118 permits the Chamber to hear a Cabinet member and submit a dismissal proposal to the President. Under Article 15 of the Law No. ZRU-403 of 11 April 2016 on Parliamentary Oversight, a public official must normally answer a deputy’s inquiry within ten days.

The research asks how digital and AI-assisted mechanisms can reduce information asymmetry and improve follow-up without replacing political judgment. The analysis is limited to the Legislative Chamber, ensuring consistency between the title, research object, and recommendations.

MATERIALS AND METHODS

The study applies four methods reflected in the results: doctrinal legal analysis of the Constitution, the Law on Parliamentary Oversight, and parliamentary procedure; documentary analysis of official Legislative Chamber reports for 2015–2019 and 2020–2024; comparative institutional analysis of selected foreign oversight practices; and principal-agent theory together with the "fire-alarm" model to explain information asymmetry and citizen-generated signals. Expert-survey, statistical, and SWOT methods are not claimed because independently reportable results were unavailable for this article.

RESULTS AND DISCUSSION

Official reports demonstrate measurable oversight effects. In 2018–2019, the Legislative Chamber held 14 Government Question Hours involving 16 ministers and heads of state committees. During scrutiny of the 2021 State Budget, factions and deputies secured 23 substantive amendments and the reallocation of approximately UZS 700 billion. These results show that oversight is most effective when a defined procedure leads to a measurable policy or fiscal outcome.

Indicator	Evidence	Implication
Question Hour	14 sessions; 16 officials (2018–2019)	Visibility requires follow-up.
Budget scrutiny	23 amendments to the 2021 budget bill	Parliament changed executive proposals.
Fiscal effect	About UZS 700 billion reallocated	Impact can be measured by outcomes.

Activity counts alone do not show whether recommendations were implemented or deadlines observed. A results-based register should therefore

track timely responses, implementation rates, repeated violations, remedy periods, and fiscal or regulatory effects. In principal-agent terms, executive bodies possess superior administrative information; parliament needs a transparent record of the complete oversight chain to reduce this asymmetry.

INSTITUTIONAL AND LEGAL PROPOSALS

First, a citizen-initiated oversight mechanism should allow a verified electronic petition to trigger committee consideration. Authentication should use the national digital-identification system; duplicates and automated submissions should be filtered; admissibility criteria should be published; and the competent committee should decide within fifteen working days whether to request information, hold a hearing, or issue a reasoned refusal. A numerical threshold should be fixed after pilot testing rather than selected arbitrarily.

Second, an Open Parliamentary Oversight Register should be introduced through amendments to the Rules of Procedure and implementing regulations of the Chamber's Secretariat. It should publish non-confidential information on inquiries, Question Hour commitments, hearings, legal deadlines, responsible institutions, responses, committee conclusions, and implementation status. This would make compliance with Article 15's ten-day rule publicly verifiable.

Third, the Law on Parliamentary Oversight should provide for parliamentary party-group hearings, allowing a faction to hear a state-body head on problems identified during constituency work. The Rules of Procedure should also introduce a minority rapporteur whose assessment accompanies the main committee report. These mechanisms would strengthen political competition and prevent oversight conclusions from merely reproducing executive explanations.

Fourth, Article 18 on parliamentary investigation should clarify the power of a special commission to request documents, summon relevant officials in accordance with law, and refer evidence of violations to competent authorities. Non-binding political recommendations must be distinguished from binding procedural duties. Unjustified delay, deliberate submission of materially

incomplete information, or repeated non-compliance should entail defined disciplinary or administrative consequences.

ARTIFICIAL INTELLIGENCE MODEL AND SAFEGUARDS

AI may support four limited functions in the register: document classification, deadline alerts, thematic clustering of recurring complaints, and detection of repeated non-compliance. The database should contain document type, subject, responsible institution, deadline, response, committee conclusion, and implementation status. AI must not determine political responsibility, recommend dismissal, or autonomously rank officials; every output should be traceable to source documents and reviewed by authorized staff.

Five safeguards are essential: human-in-the-loop review; data minimization and lawful-purpose processing; publication of classification criteria and correction procedures; cybersecurity protection against unauthorized alteration and service disruption; and a right to challenge inaccurate automated classifications. These requirements make AI a controlled analytical instrument rather than an opaque decision-maker.

CONCLUSION

The Legislative Chamber possesses important constitutional and statutory oversight powers, and official reports show measurable effects in Question Hour and budget scrutiny. The remaining task is to transform separate activities into a transparent and enforceable cycle. A citizen-initiated mechanism, open register, party-group hearings, minority rapporteur, and differentiated procedural responsibility can reduce information asymmetry and strengthen follow-up. AI can improve classification and monitoring only under human supervision, data-protection rules, cybersecurity safeguards, and algorithmic transparency.

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KICHIK BIZNES SUBYEKTLARI BOZORDAGI MAVQEINI INNOVATSION YONDASHUVLAR ASOSIDA MUSTAHKAMLASH (XUSUSIY TA'LIM MARKAZLARI MISOLIDA)

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Annotatsiya. *Ushbu maqolada kichik biznes subyektlari, xususan, xususiy ta'lim markazlarining raqobatbardoshligini innovatsion yondashuvlar asosida oshirish masalalari tadqiq etilgan. Tadqiqotning dolzarbligi ta'lim xizmatlari bozorida raqobatning yildan-yilga kuchayib borayotgani, buning natijasida faqat sifatli xizmat taklif etuvchi emas, balki innovatsion boshqaruv va marketing vositalaridan foydalanuvchi markazlargina barqaror rivojlanish imkoniyatiga ega bo'layotgani bilan izohlanadi. Tadqiqot jarayonida ekspert so'rovi, kontent-tahlil, statistik taqqoslash va keys-stadi metodlaridan foydalanilgan bo'lib, innovatsion yondashuvlarni — brendlashtirish va ijtimoiy tarmoqlar orqali targ'ibotni, gibrid (offlayn-onlayn) o'qitish formatini, mijozlar bilan uzoq muddatli munosabatlarni qo'llab-quvvatlash dasturlarini hamda o'qituvchilarni natijaga bog'liq rag'batlantirish tizimini — joriy etish xususiy ta'lim markazlarining bozordagi mavqeini, o'quvchilar sonini va o'qituvchilar faolligini sezilarli darajada yaxshilashi asoslab berilgan. Tadqiqot natijalari ta'lim markazlari rahbarlari va tegishli sohadagi mutaxassislar uchun amaliy ahamiyatga ega.*

Kalit so'zlar: *kichik biznes, raqobatbardoshlik, innovatsion yondashuv, xususiy ta'lim markazi, brendlashtirish, gibrid o'qitish, mijozlar sodiqligi.*

Annotation. *This article examines enhancing the competitiveness of small business entities, specifically private education centers, through innovative approaches. The relevance of the study is explained by the yearly intensification of competition in the education services market, as a result of which only centers that apply innovative management and marketing tools, rather than merely offering quality service, gain sustainable development opportunities. The study applied expert survey, content analysis, statistical comparison and case-study methods, demonstrating that introducing innovative approaches — branding and social-media-based promotion, a hybrid (offline-online) teaching format, long-term customer*

relationship support programs, and a performance-based teacher incentive system — considerably improves the market position, student enrollment and teacher engagement of private education centers. The findings are of practical value to education center managers and relevant specialists.

Keywords: *small business, competitiveness, innovative approach, private education center, branding, hybrid learning, customer loyalty.*

Аннотация. *В данной статье рассматривается повышение конкурентоспособности субъектов малого бизнеса, в частности частных образовательных центров, на основе инновационных подходов. Актуальность исследования объясняется ежегодным усилением конкуренции на рынке образовательных услуг, вследствие чего устойчивые возможности развития получают только те центры, которые применяют инновационные инструменты управления и маркетинга, а не только предлагают качественные услуги. В исследовании применены методы экспертного опроса, контент-анализа, статистического сравнения и кейс-стади, в результате чего доказано, что внедрение инновационных подходов — брендинга и продвижения через социальные сети, гибридного (офлайн-онлайн) формата обучения, программ поддержки долгосрочных отношений с клиентами и системы стимулирования преподавателей по результатам — существенно улучшает рыночную позицию, набор учащихся и вовлечённость преподавателей частных образовательных центров. Результаты исследования имеют практическую значимость для руководителей образовательных центров и профильных специалистов.*

Ключевые слова: *малый бизнес, конкурентоспособность, инновационный подход, частный образовательный центр, брендинг, гибридное обучение, лояльность клиентов.*

Bozor iqtisodiyoti sharoitida kichik biznes subyektlarining raqobatbardoshligini oshirish ularning barqaror faoliyat yuritishini ta’minlovchi asosiy shartlardan biri hisoblanadi. So‘nggi yillarda O‘zbekistonda ta’lim xizmatlari bozorining faollashishi, xususan, xususiy ta’lim markazlari sonining ortib borishi kuzatilmoqda. Biroq bozorga yangi ishtirokchilarning kirib kelishi natijasida raqobat kuchayib, faqat innovatsion yondashuvlarni qo‘llovchi markazlargina o‘z mavqeini saqlab qolish imkoniyatiga ega bo‘lmoqda.

Xususiy ta’lim markazlari — repetitorlik markazlari, xorijiy til o‘quv markazlari, bolalar rivojlantirish klublari — ko‘pincha bir-biriga o‘xshash xizmatlarni taklif etadi, bu esa mijozlarning e’tiborini jalb qilishda faqat narx va joylashuvga emas, balki brend obro‘si, o‘qitish formati va mijozlar bilan munosabatlar sifatiga ham e’tibor qaratishni taqozo etadi. Shu sababli xususiy ta’lim markazlari faoliyatiga innovatsion yondashuvlarni izchil joriy etish dolzarb ilmiy-amaliy masaladir.

Innovatsion yondashuv xususiy ta’lim markazi uchun nafaqat marketing vositasi, balki mijozlar bilan uzoq muddatli munosabatlarni shakllantirish, o‘quv jarayonini moslashuvchan tashkil etish va xodimlarni rag‘batlantirishning yaxlit tizimi sifatida namoyon bo‘ladi. Ushbu tizim brendlashtirish, raqamli targ‘ibot, o‘qitish formati va kadrlar siyosatiga oid komponentlarni o‘zaro bog‘liq holda birlashtiradi.

Tadqiqotning maqsadi innovatsion yondashuvlar asosida kichik biznes subyektlari, xususan, xususiy ta’lim markazlarining raqobatbardoshligini oshiruvchi amaliy metodikani ishlab chiqish va uning samaradorligini asoslashdan iborat. Ushbu maqsadga erishish uchun quyidagi vazifalar belgilangan: raqobatbardoshlikni oshirishning nazariy asoslarini o‘rganish; xususiy ta’lim markazlarida innovatsion vositalarni qo‘llash omillarini aniqlash; ishlab chiqilgan metodikani amaliyotda sinab ko‘rish va natijalarini tahlil qilish.

Mavzu doirasida mahalliy tadqiqotchilarning ishlari tahlil qilindi.

O.Rustamov “Kichik biznesda raqobatbardoshlikni oshirish yo‘llari” asarida kichik tadbirkorlik subyektlarining bozordagi mavqeini mustahkamlashda brend siyosatining o‘rnini alohida ta’kidlagan [1: 27]. Muallifning fikricha, kuchli brend obro‘siga ega bo‘lgan kichik korxonalar narx bo‘yicha raqobatga kamroq muhtoj bo‘ladi [1: 31].

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uyg‘unlashtirish o‘quvchilarning qulayligini oshirish bilan bir qatorda markaz xarajatlarini ham optimallashtirishini ko‘rsatgan [2: 44].

T.Yoqubov va L.Saidova (2022) “Ijtimoiy tarmoqlar orqali marketing” qo‘llanmasida kichik biznes subyektlarining ijtimoiy tarmoqlardan foydalanish strategiyalarini o‘rgangan. Mualliflar mijozlar bilan muntazam muloqot va foydali kontent taqdim etish brend sodiqligini shakllantirishning asosiy usuli ekanligini asoslaganlar [3: 36].

H.Egamberdiyev (2024) “O‘zbekistonda ta’lim xizmatlari bozorining rivojlanish tendensiyalari” tadqiqotida xususiy ta’lim markazlari o‘rtasidagi raqobat darajasini mintaqalar kesimida tahlil qilgan va yirik shaharlarda raqobat ayniqsa yuqori ekanligini statistik jihatdan asoslagan [4: 58].

D.Sattorova (2023) “O‘qituvchilarni rag‘batlantirishning zamonaviy modellari” ishida natijaga bog‘liq mukofotlash tizimlarining o‘qituvchilar faolligiga ta’sirini o‘rgangan va bunday tizimlar o‘qituvchilarning mehnat unumdorligini oshirishini ko‘rsatgan [5: 49].

Yuqoridagi manbalarning tahlili shuni ko‘rsatadiki, xususiy ta’lim markazlarining raqobatbardoshligini oshirish uchun brendlashtirish, gibrid o‘qitish, raqamli marketing va o‘qituvchilarni rag‘batlantirish mexanizmlarini uyg‘unlashtiruvchi yaxlit yondashuv zarur.

Tadqiqotda quyidagi metodlar qo‘llanildi: nazariy qismda ilmiy adabiyotlarni qiyosiy tahlil qilish; empirik qismda ekspert so‘rovi va keys-stadi metodi; natijalarni baholashda statistik taqqoslash metodi.

Ekspert so‘rovida o‘n beshta xususiy ta’lim markazi rahbari va o‘n oltita o‘qituvchi ishtirok etdi. Ular bilan innovatsion vositalarni qo‘llash tajribasi, ularning natijalari va uchraydigan qiyinchiliklar bo‘yicha so‘rovnoma o‘tkazildi.

Keys-stadi metodi doirasida Andijon shahridagi ikkita xususiy ta’lim markazi — biri innovatsion yondashuvlarni faol qo‘llovchi, ikkinchisi an’anaviy usulda faoliyat yurituvchi — bir yil davomida kuzatildi. Markazlarning o‘quvchilar soni, brend tanilishi va daromadlilik ko‘rsatkichlari qiyoslandi.

Kuzatuv boshida ikkala markazning o‘quvchilar soni deyarli teng edi (farq besh foizdan oshmadi). Yil yakunida esa innovatsion markazda o‘quvchilar soni qirq ikki foizga o‘sgan bo‘lsa, an’anaviy markazda bu ko‘rsatkich atigi o‘n ikki foizni tashkil etdi.

Brend tanilishi bo‘yicha innovatsion markazda ijtimoiy tarmoqlardagi obunachilar soni uch baravardan ortiq oshdi, an’anaviy markazda esa bu ko‘rsatkich sezilarli o‘zgarmadi. Daromadlilik bo‘yicha innovatsion markazda o‘rtacha oylik daromad qirq to‘qqiz foiz punktga oshdi, an’anaviy markazda esa o‘n uch foiz punktga oshdi.

Ekspert so‘rovi natijalariga ko‘ra, so‘rovda ishtirok etgan rahbarlarning sakson to‘rt foizi brendlashtirish va ijtimoiy tarmoqlar orqali targ‘ibotni eng samarali innovatsion vosita sifatida baholadi. O‘qituvchilarning yetmish sakkiz foizi esa natijaga bog‘liq rag‘batlantirish tizimi ularning ish faoliyatidan qoniqish darajasini oshirganini qayd etdi.

Olingan natijalar innovatsion yondashuvlarning xususiy ta’lim markazlari raqobatbardoshligini oshirishdagi ahamiyatini tasdiqladi.

Birinchidan, innovatsion markazda kuzatilgan o‘quvchilar sonining sezilarli o‘sishi O.Rustamovning kuchli brend obro‘siga ega kichik korxonalar narx raqobatiga kamroq muhtoj bo‘lishiga oid xulosasini tasdiqlaydi.

Ikkinchidan, gibrid o‘qitish formatining qo‘llanilishi Z.Karimovaning ushbu format o‘quvchilar qulayligi va xarajatlar optimallashuviga ijobiy ta’sir ko‘rsatishiga oid xulosasini amalda tasdiqladi.

Uchinchidan, ijtimoiy tarmoqlardagi obunachilar sonining sezilarli o‘sishi T.Yoqubov va L.Saidovaning muntazam muloqot brend sodiqligini shakllantirishning asosiy usuli ekanligiga oid xulosasini mustahkamlaydi.

To‘rtinchidan, o‘qituvchilarning ish faoliyatidan qoniqish darajasining oshishi D.Sattorovaning natijaga bog‘liq mukofotlash tizimlari mehnat unumdorligini oshirishiga oid xulosasini tasdiqladi.

Tadqiqotning cheklovi sifatida uning faqat Andijon shahridagi ikkita markaz misolida o‘tkazilganini ta’kidlash lozim. Kelajakdagi tadqiqotlarda namuna hajmini kengaytirish va boshqa mintaqalarni ham qamrab olish tavsiya etiladi.

Ushbu tadqiqot kichik biznes subyektlari, xususan, xususiy ta’lim markazlarining raqobatbardoshligini innovatsion yondashuvlar asosida oshirish metodikasini ishlab chiqishga bag‘ishlandi. Tadqiqot davomida quyidagi xulosalarga kelindi: birinchidan, brendlashtirish va raqamli targ‘ibot mijozlarni jalb qilishning eng samarali vositalaridan biridir; ikkinchidan, gibrid o‘qitish formati o‘quvchilar sonini oshirish va xarajatlarni optimallashtirishga xizmat qiladi; uchinchidan, o‘qituvchilarni natijaga bog‘liq rag‘batlantirish tizimi ularning faolligini oshiradi. Ishlab chiqilgan metodika O‘zbekistondagi xususiy ta’lim markazlari faoliyatida qo‘llanilishi tavsiya etiladi.

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KICHIK BIZNES SUBYEKTLARI RAQOBATBARDOSHLIGINI INNOVATSION YONDASHUVLAR ASOSIDA OSHIRISH (XUSUSIY TA'LIM MARKAZLARI MISOLIDA)

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Annotatsiya. *Ushbu maqolada kichik biznes subyektlari, xususan, xususiy ta'lim markazlarining raqobatbardoshligini innovatsion yondashuvlar asosida oshirish masalalari tadqiq etilgan. Tadqiqotning dolzarbligi ta'lim xizmatlari bozorida raqobatning yildan-yilga kuchayib borayotgani, buning natijasida faqat sifatli xizmat taklif etuvchi emas, balki innovatsion boshqaruv va marketing vositalaridan foydalanuvchi markazlargina barqaror rivojlanish imkoniyatiga ega bo'layotgani bilan izohlanadi. Tadqiqot jarayonida ekspert so'rovi, kontent-tahlil, statistik taqqoslash va keys-stadi metodlaridan foydalanilgan bo'lib, innovatsion yondashuvlarni — brendlashtirish va ijtimoiy tarmoqlar orqali targ'ibotni, gibrid (offlayn-onlayn) o'qitish formatini, mijozlar bilan uzoq muddatli munosabatlarni qo'llab-quvvatlash dasturlarini hamda o'qituvchilarni natijaga bog'liq rag'batlantirish tizimini — joriy etish xususiy ta'lim markazlarining bozordagi mavqeini, o'quvchilar sonini va o'qituvchilar faolligini sezilarli darajada yaxshilashi asoslab berilgan. Tadqiqot natijalari ta'lim markazlari rahbarlari va tegishli sohadagi mutaxassislar uchun amaliy ahamiyatga ega.*

Kalit so'zlar: *kichik biznes, raqobatbardoshlik, innovatsion yondashuv, xususiy ta'lim markazi, brendlashtirish, gibrid o'qitish, mijozlar sodiqligi.*

Annotation. *This article examines enhancing the competitiveness of small business entities, specifically private education centers, through innovative approaches. The relevance of the study is explained by the yearly intensification of competition in the education services market, as a result of which only centers that apply innovative management and marketing tools, rather than merely offering quality service, gain sustainable development opportunities. The study applied expert survey, content analysis, statistical comparison and case-study methods, demonstrating that introducing innovative approaches — branding and social-*

media-based promotion, a hybrid (offline-online) teaching format, long-term customer relationship support programs, and a performance-based teacher incentive system — considerably improves the market position, student enrollment and teacher engagement of private education centers. The findings are of practical value to education center managers and relevant specialists.

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Аннотация. *В данной статье рассматривается повышение конкурентоспособности субъектов малого бизнеса, в частности частных образовательных центров, на основе инновационных подходов. Актуальность исследования объясняется ежегодным усилением конкуренции на рынке образовательных услуг, вследствие чего устойчивые возможности развития получают только те центры, которые применяют инновационные инструменты управления и маркетинга, а не только предлагают качественные услуги. В исследовании применены методы экспертного опроса, контент-анализа, статистического сравнения и кейс-стади, в результате чего доказано, что внедрение инновационных подходов — брендинга и продвижения через социальные сети, гибридного (офлайн-онлайн) формата обучения, программ поддержки долгосрочных отношений с клиентами и системы стимулирования преподавателей по результатам — существенно улучшает рыночную позицию, набор учащихся и вовлечённость преподавателей частных образовательных центров. Результаты исследования имеют практическую значимость для руководителей образовательных центров и профильных специалистов.*

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Xususiy ta’lim markazlari — repetitorlik markazlari, xorijiy til o‘quv markazlari, bolalar rivojlantirish klublari — ko‘pincha bir-biriga o‘xshash xizmatlarni taklif etadi, bu esa mijozlarning e’tiborini jalb qilishda faqat narx va joylashuvga emas, balki brend obro‘si, o‘qitish formati va mijozlar bilan munosabatlar sifatiga ham e’tibor qaratishni taqozo etadi. Shu sababli xususiy ta’lim markazlari faoliyatiga innovatsion yondashuvlarni izchil joriy etish dolzarb ilmiy-amaliy masaladir.

Innovatsion yondashuv xususiy ta’lim markazi uchun nafaqat marketing vositasi, balki mijozlar bilan uzoq muddatli munosabatlarni shakllantirish, o‘quv jarayonini moslashuvchan tashkil etish va xodimlarni rag‘batlantirishning yaxlit tizimi sifatida namoyon bo‘ladi. Ushbu tizim brendlashtirish, raqamli targ‘ibot, o‘qitish formati va kadrlar siyosatiga oid komponentlarni o‘zaro bog‘liq holda birlashtiradi.

Tadqiqotning maqsadi innovatsion yondashuvlar asosida kichik biznes subyektlari, xususan, xususiy ta’lim markazlarining raqobatbardoshligini oshiruvchi amaliy metodikani ishlab chiqish va uning samaradorligini asoslashdan iborat. Ushbu maqsadga erishish uchun quyidagi vazifalar belgilangan: raqobatbardoshlikni oshirishning nazariy asoslarini o‘rganish; xususiy ta’lim markazlarida innovatsion vositalarni qo‘llash omillarini aniqlash; ishlab chiqilgan metodikani amaliyotda sinab ko‘rish va natijalarini tahlil qilish.

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Yuqoridagi manbalarning tahlili shuni ko‘rsatadiki, xususiy ta’lim markazlarining raqobatbardoshligini oshirish uchun brendlashtirish, gibrid o‘qitish, raqamli marketing va o‘qituvchilarni rag‘batlantirish mexanizmlarini uyg‘unlashtiruvchi yaxlit yondashuv zarur.

Tadqiqotda quyidagi metodlar qo‘llanildi: nazariy qismda ilmiy adabiyotlarni qiyosiy tahlil qilish; empirik qismda ekspert so‘rovi va keys-stadi metodi; natijalarni baholashda statistik taqqoslash metodi.

Ekspert so‘rovida o‘n beshta xususiy ta’lim markazi rahbari va o‘n oltita o‘qituvchi ishtirok etdi. Ular bilan innovatsion vositalarni qo‘llash tajribasi, ularning natijalari va uchraydigan qiyinchiliklar bo‘yicha so‘rovnoma o‘tkazildi.

Keys-stadi metodi doirasida Andijon shahridagi ikkita xususiy ta’lim markazi — biri innovatsion yondashuvlarni faol qo‘llovchi, ikkinchisi an’anaviy usulda faoliyat yurituvchi — bir yil davomida kuzatildi. Markazlarning o‘quvchilar soni, brend tanilishi va daromadlilik ko‘rsatkichlari qiyoslandi.

Kuzatuv boshida ikkala markazning o‘quvchilar soni deyarli teng edi (farq besh foizdan oshmadi). Yil yakunida esa innovatsion markazda o‘quvchilar soni qirq ikki foizga o‘sgan bo‘lsa, an’anaviy markazda bu ko‘rsatkich atigi o‘n ikki foizni tashkil etdi.

Brend tanilishi bo‘yicha innovatsion markazda ijtimoiy tarmoqlardagi obunachilar soni uch baravardan ortiq oshdi, an’anaviy markazda esa bu ko‘rsatkich sezilarli o‘zgarmadi. Daromadlilik bo‘yicha innovatsion markazda o‘rtacha oylik daromad qirq to‘qqiz foiz punktga oshdi, an’anaviy markazda esa o‘n uch foiz punktga oshdi.

Ekspert so‘rovi natijalariga ko‘ra, so‘rovda ishtirok etgan rahbarlarning sakson to‘rt foizi brendlashtirish va ijtimoiy tarmoqlar orqali targ‘ibotni eng samarali innovatsion vosita sifatida baholadi. O‘qituvchilarning yetmish sakkiz foizi esa natijaga bog‘liq rag‘batlantirish tizimi ularning ish faoliyatidan qoniqish darajasini oshirganini qayd etdi.

Olingan natijalar innovatsion yondashuvlarning xususiy ta’lim markazlari raqobatbardoshligini oshirishdagi ahamiyatini tasdiqladi.

Birinchidan, innovatsion markazda kuzatilgan o‘quvchilar sonining sezilarli o‘sishi O.Rustamovning kuchli brend obro‘siga ega kichik korxonalar narx raqobatiga kamroq muhtoj bo‘lishiga oid xulosasini tasdiqlaydi.

Ikkinchidan, gibrid o‘qitish formatining qo‘llanilishi Z.Karimovaning ushbu format o‘quvchilar qulayligi va xarajatlar optimallashuviga ijobiy ta’sir ko‘rsatishiga oid xulosasini amalda tasdiqladi.

Uchinchidan, ijtimoiy tarmoqlardagi obunachilar sonining sezilarli o‘sishi T.Yoqubov va L.Saidovaning muntazam muloqot brend sodiqligini shakllantirishning asosiy usuli ekanligiga oid xulosasini mustahkamlaydi.

To‘rtinchidan, o‘qituvchilarning ish faoliyatidan qoniqish darajasining oshishi D.Sattorovaning natijaga bog‘liq mukofotlash tizimlari mehnat unumdorligini oshirishiga oid xulosasini tasdiqladi.

Tadqiqotning cheklovi sifatida uning faqat Andijon shahridagi ikkita markaz misolida o‘tkazilganini ta’kidlash lozim. Kelajakdagi tadqiqotlarda namuna hajmini kengaytirish va boshqa mintaqalarni ham qamrab olish tavsiya etiladi.

Ushbu tadqiqot kichik biznes subyektlari, xususan, xususiy ta’lim markazlarining raqobatbardoshligini innovatsion yondashuvlar asosida oshirish metodikasini ishlab chiqishga bag‘ishlandi. Tadqiqot davomida quyidagi xulosalarga kelindi: birinchidan, brendlashtirish va raqamli targ‘ibot mijozlarni jalb qilishning eng samarali vositalaridan biridir; ikkinchidan, gibrid o‘qitish formati o‘quvchilar sonini oshirish va xarajatlarni optimallashtirishga xizmat qiladi; uchinchidan, o‘qituvchilarni natijaga bog‘liq rag‘batlantirish tizimi ularning faolligini oshiradi. Ishlab chiqilgan metodika O‘zbekistondagi xususiy ta’lim markazlari faoliyatida qo‘llanilishi tavsiya etiladi.

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TURIZMNI BARQAROR RIVOJLANTIRISHNING TASHKILIY-IQTISODIY MEXANIZMI: XALQARO TAJRIBA TAHLILI

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Annotatsiya: *turizmni barqaror rivojlantirish zamonaviy iqtisodiyotning ustuvor yo‘nalishlaridan biri bo‘lib, iqtisodiy o‘sish, ijtimoiy farovonlik va ekologik muvozanatni ta’minlashda muhim ahamiyat kasb etadi. Jahon amaliyoti shuni ko‘rsatadiki, samarali tashkiliy-iqtisodiy mexanizmlarni joriy etish turizm sohasining raqobatbardoshligini oshirish va mavjud resurslardan oqilona foydalanishga xizmat qiladi. Mazkur maqolada turizmni barqaror rivojlantirishning tashkiliy-iqtisodiy mexanizmlari xalqaro tajriba asosida tahlil qilinib, ularni milliy amaliyotga moslashtirish imkoniyatlari yoritiladi.*

Kalit so‘zlar: *barqaror turizm, turizmni rivojlantirish, tashkiliy-iqtisodiy mexanizm, xalqaro tajriba, turizm siyosati, innovatsiyalar, ekologik barqarorlik, iqtisodiy samaradorlik.*

Abstract: *Sustainable tourism development has become one of the key priorities of the modern economy, contributing to economic growth, social well-being, and environmental sustainability. International practice demonstrates that effective organizational and economic mechanisms enhance the competitiveness of the tourism sector while ensuring the rational use of available resources. This article analyzes organizational and economic mechanisms for sustainable tourism development based on international experience and examines the possibilities of adapting successful practices to the national context.*

Keywords: *sustainable tourism, tourism development, organizational and economic mechanism, international experience, tourism policy, innovation, environmental sustainability, economic efficiency.*

KIRISH

Jahon iqtisodiyotida turizm eng tez rivojlanayotgan tarmoqlardan biri hisoblanadi. Butunjahon turizm tashkilotining ma’lumotlariga ko‘ra 2025-yilda dunyo bo‘ylab sayohat qilgan xorijiy turistlar soni 1,52 milliard nafarni tashkil

etgan bo‘lib, bu ko‘rsatkich 2024-yilga nisbatan 4 foizlik o‘sishni (60 million turist) tashkil etadi [1]. Mazkur soha millionlab ish o‘rinlarini yaratish, hududlarning investitsion jozibadorligini oshirish va milliy daromadlarni ko‘paytirishda muhim rol o‘ynaydi. Biroq turizm oqimlarining keskin ortishi ayrim hududlarda ekologik muammolar, resurslardan haddan tashqari foydalanish va mahalliy aholi manfaatlariga salbiy ta’sir ko‘rsatishi mumkin.

Shu sababli turizmni barqaror rivojlantirish konsepsiyasi xalqaro hamjamiyat tomonidan ustuvor yo‘nalish sifatida e’tirof etilmoqda. Barqaror turizm iqtisodiy foyda olish bilan bir qatorda ekologik muvozanatni saqlash va ijtimoiy manfaatlarni ta’minlashni nazarda tutadi. Mazkur tadqiqotning maqsadi turizmni barqaror rivojlantirishning tashkiliy-iqtisodiy mexanizmlarini xalqaro tajriba asosida tahlil qilish hamda ularni amaliyotga tatbiq etish bo‘yicha tavsiyalar ishlab chiqishdan iborat.

Adabiyotlar tahlili. 1987-yilda qabul qilingan Brutland Komissiyasining fikriga ko‘ra “Barqaror rivojlanish bu hozirgi avlod ehtiyojlarini kelajak avlodlarning o‘z ehtiyojlarini qondirish imkoniyatiga putur yetkazmagan holda ta'minlaydigan rivojlanishdir” [2]. Olim Batlerning ta’kidlashicha “Barqaror turizm — bu ma'lum hududda uzoq muddat davomida o‘z hayotiyligini saqlab qoladigan tarzda rivojlantiriladigan va boshqariladigan turizmdir” [3]. Tadqiqotchi Jefreyning fikricha “Turizmni rivojlantirish mahalliy aholi turmush sifatini yaxshilashi bilan birga tabiiy va madaniy resurslarni ham muhofaza qilishi kerak” [4].

Metodologiya. Tadqiqotda turizmni boshqarishning turli mamlakatlarda qo‘llanilayotgan mexanizmlarini solishtirish orqali qiyosiy tahlil, turizm tizimining iqtisodiy, ekologik va ijtimoiy elementlari o‘rtasidagi o‘zaro bog‘liqlikni aniqlash orqali tizimli yondashuv, xalqaro tashkilotlar, ilmiy maqolalar va normativ hujjatlar mazmunini o‘rganish orqali kontent tahlili, olingan natijalarni umumlashtirish va amaliy tavsiyalar ishlab chiqish orqali analiz-sintez usullaridan foydalanildi.

Natijalar. Turizm tarmog‘ining barqaror taraqqiyoti mamlakat iqtisodiyotini rivojlantirish, aholi bandligini ta’minlash hamda tabiiy va madaniy merosni asrab-avaylash jarayonlarida muhim omil sifatida namoyon bo‘ladi. Mazkur maqsadlarga erishishda turizm faoliyatini samarali boshqarishga xizmat qiluvchi tashkiliy va iqtisodiy mexanizmlarni ishlab chiqish va amaliyotga joriy etish ustuvor ahamiyat kasb etadi. Olim I.Ivanovning fikricha, “turizmni barqaror rivojlantirishning tashkiliy-iqtisodiy mexanizmi esa turizm sohasining uzoq muddatli va muvozanatli rivojlanishini ta’minlashga yo‘naltirilgan boshqaruv, iqtisodiy va institutsional vositalar tizimini o‘zida mujassam etadi” [5].

Bugungi kunda dunyo davlatlarida turizmning salbiy oqibatlarini kamaytirish va sohani barqaror rivojlantirish ustida ko‘plab strategiyalar ishlab chiqilgan bo‘lib, ular barqaror turistik infratuzilmani izchil rivojlantirishga yo‘naltirilgan dastur hamda chora-tadbirlar majmuasi hisoblanadi. (1-jadval)

1-jadval

Turizmni barqaror rivojlantirish doirasida ishlab chiqilgan dasturlar va chora-tadbirlar[4]

Davlat	Dastur va chora-tadbirlar
Fransiya	“Paris Low Emission Zone” – Parijda karbon izini kamaytirish maqsadida ekologik transport tizimi joriy qilingan, “Eco-Tourism Labels” – sayyohlik ob’ektlari uchun ekologik standartlar joriy etilgan, “Green France” – ekologik mehmonxonalar va qayta tiklanuvchi energiya loyihalari;
Shvesiya	Mehmonxonalar va turistik ob’ektlar barqarorlik standartlariga javob berishi uchun “Nordic Swan” ekologik markeriga ega bo‘lishi, “Green Tourism” dasturi – karbon izini kamaytirish, Ekologik mehmonxonalarda qayta tiklanuvchi energiya manbalaridan foydalanish;

[4] Muallif ishlanmasi

Ispaniya	“Sustainable Spain” dasturi doirasida turizmning salbiy ekologik ta’sirini kamaytirish, “Plastic Free Beaches” – Balear orollarida plastik chiqindilarni kamaytirish, Balear va Kanar orollarida turistlar sonini cheklash, Barselona va Valensiyada quyosh energiyasidan foydalanuvchi mehmonxonalar;
Yaponiya	“Go Green Japan” dasturi – ekologik mehmonxonalar tarmog‘I, “Sustainable Travel Japan” – madaniy merosni muhofaza qilish, tabiatga zarar yetkazmaydigan “smart tourism”;
Hindiston	“Incredible India Green” – tarixiy ob’ektlar atrofini himoya qilish dasturi, Assam va Uttarakxand shtatlari maxsus ekoturizm hududlari, mahalliy jamoalarni jalb qilish va turizmdan tushgan daromadni ularga yo‘naltirish;
Kanada	“Eco Parks Canada” dasturi asosida sayyohlarning tabiatga salbiy ta’sirini kamaytirish, barqaror transport tizimi – turizmda velosiped va elektromobillar harakatini ommalashtirish;
Braziliya	Turizmda Amazonka o‘rmonlari muhofazasi va mahalliy qabilalar huquqlarini himoya qilish uchun “Sustainable Amazon” dasturi;
Birlashgan Arab Amirliklari	Dubay va Abu-Dabi toza energiya va barqaror infratuzilma asosida turizmni rivojlantirish, “Green Dubai” dasturi doirasida turizm ob’ektlarida quyosh energiyasidan foydalanish, “Smart City”da energiya tejovchi binolar faoliyatini yo‘lga qo‘yish;
Saudiya Arabistoni	“Vision 2030” dasturi orqali barqaror turizmni rivojlantirishga katta e’tibor qaratmoqda, Qizil dengizdagi korall riflarini himoya qilish dasturlari, Haj va Umra ziyoratlarida karbon izini kamaytirishga qaratilgan choralar, “NEOM” – kelajakdagi ekoshahar loyihasi.
Italiya	“Eco-Friendly Villages” dasturi – qishloq joylarida barqaror turizmni rivojlantirish, Venesiyada sayyohlar oqimini nazorat

	qilish uchun kruiz kemalarini shahar markaziga kiritishni cheklash, “Venice Green Tax” – Venesiyaga kirish uchun turistlardan ekologik to‘lov undirish.

XULOSA

Turizmning barqaror rivojlanishi tabiiy resurslardan oqilona foydalanish, ijtimoiy-iqtisodiy manfaatlarni ta’minlash hamda madaniy merosni muhofaza qilishni uyg‘unlashtirgan holda amalga oshiriladigan uzoq muddatli rivojlanish jarayonini anglatadi. Ushbu jarayonni samarali yo‘lga qo‘yish strategik boshqaruv va puxta rejalashtirish mexanizmlarini talab etadi. Shu jihatdan, turizmni barqaror rivojlantirish algoritmi mazkur sohani tizimli ravishda tashkil etish va boshqarishga qaratilgan bosqichma-bosqich amalga oshiriladigan chora-tadbirlar majmui sifatida talqin etiladi. Ilmiy nuqtai nazardan, bu algoritm huquqiy, iqtisodiy, ekologik va ijtimoiy mexanizmlar yig‘indisidan iborat bo‘lib, hudud yoki mamlakat miqyosida turizmning muvozanatli va barqaror rivojlanishini ta’minlashga xizmat qiladi. Xalqaro tajriba asosida turizmni barqaror rivojlantirish algoritmi uzviy, kompleks va ko‘p tomonlama yondashuvni talab qiladi. Xalqaro tajriba ushbu elementlarning uyg‘un qo‘llanilishi turizm sohasining raqobatbardoshligini oshirish, resurslardan oqilona foydalanish va uzoq muddatli iqtisodiy samaradorlikni ta’minlashini ko‘rsatadi.

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MHXS 15 (IFRS 15) STANDARTI ASOSIDA TOG‘-KON SANOATI KORXONALARIDA DAROMADLARNI TAN OLISH TIZIMINI TAKOMILLASHTIRISH: “NAVOIY KON-METALLURGIYA KOMBINATI” AJ MISOLIDA BARQAROR RIVOJLANISH KONSEPSIYASI

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Annotatsiya. *O‘zbekiston iqtisodiyoti xalqaro moliyaviy hisobot standartlariga integratsiyalashuvi sharoitida daromadlarni tan olish masalasi dolzarblik kasb etmoqda. Tadqiqotda “Navoiy kon-metallurgiya kombinati” AJ (NKMK) misolida milliy buxgalteriya hisobi standartlari (BHMS) bilan MHXS 15 (IFRS 15) o‘rtasidagi tafovutlar tahlil qilinadi. Maqsad — uzoq muddatli yetkazib berish shartnomalari bo‘yicha daromadni besh bosqichli model asosida taqsimlash mexanizmini ishlab chiqishdir. Tahliliy qiyoslash va gipotetik modellashtirish usullari yordamida amaliy keys taqdim etiladi hamda raqamli avtomatlashtirish bo‘yicha takliflar beriladi. Natijalar korxonaning moliyaviy shaffofligi va investitsiyaviy jozibadorligini oshirishga xizmat qiladi.*

Abstract. *As Uzbekistan integrates with international financial reporting standards, revenue recognition has become increasingly important. This study analyses discrepancies between national accounting standards (BHMS) and IFRS 15 using the example of Navoi Mining and Metallurgical Combinat JSC. It develops a mechanism for allocating revenue from long-term supply contracts under the five-step model, presenting a hypothetical case study and proposals for digital automation that enhance financial transparency and investment attractiveness within a sustainable development framework.*

Kalit so‘zlar: *daromadlarni tan olish, MHXS 15 (IFRS 15), besh bosqichli model, tog‘-kon sanoati, barqaror rivojlanish, raqamli avtomatlashtirish.*

Key words: *revenue recognition, IFRS 15, five-step model, mining industry, sustainable development, digital automation.*

KIRISH

So‘nggi o‘n yillikda O‘zbekiston iqtisodiyotining xalqaro moliya bozorlariga integratsiyalashuvi strategik ustuvorlik sifatida belgilanmoqda, buning muhim tarkibiy qismi — milliy buxgalteriya hisobi tizimini MHXS

(IFRS) talablariga muvofiqlashtirishdir. Xususiylashtirish, xorijiy investitsiyalarni jalb qilish va qimmatli qog‘ozlar bozorini rivojlantirish borasidagi me’yoriy hujjatlar korxonalarni xalqaro standartlar asosida hisobot tuzishga undamoqda. Shu boisdan daromadni to‘g‘ri va shaffof tan olish strategik-boshqaruv ahamiyatiga ega bo‘lib bormoqda, chunki daromad moliyaviy natijaning asosiy ko‘rsatkichi va investorlar uchun birlamchi parametrdir.

Daromadni tan olish tartibidagi noaniqlik moliyaviy hisobotga bo‘lgan ishonchni pasaytiradi, kredit reytingga salbiy ta’sir ko‘rsatadi va xalqaro kapital bozorlariga chiqish imkoniyatini cheklaydi. Bu masala, ayniqsa, uzoq muddatli shartnomalar va murakkab yetkazib berish sxemalari keng qo‘llaniladigan tog‘-kon-metallurgiya tarmog‘i uchun dolzarbdir. 2018-yildan kuchga kirgan MHXS 15 “Xaridorlar bilan shartnomalar bo‘yicha tushumlar” standarti avvalgi tarmoq bo‘yicha parchalangan me’yorlarni yagona, besh bosqichli model bilan almashtirdi — bu model daromadni nazoratning xaridorga o‘tishi asosida tan olishni talab qiladi, an’anaviy “yuklab jo‘natish — hisob-faktura” mantig‘idan tubdan farqlanadi.

NKMK O‘zbekiston tog‘-kon sanoatining yetakchi korxonasi sifatida uran, oltin va boshqa metallarni qazib chiqarish, boyitish va xalqaro bozorlarga yetkazib berish bo‘yicha uzoq muddatli shartnomalar tuzadi. Bunday shartnomalarda mahsulot sifati, yetkazib berish bosqichlari, narx tuzatish mexanizmlari va logistika xarajatlarini taqsimlash kabi murakkab shartlar mavjud bo‘lib, daromadni bir necha ijro majburiyati kesimida tan olishni taqozo etadi. Shu sababli tadqiqot maqsadi — NKMK misolida MHXS 15 talablarini amaliy qo‘llash mexanizmini ishlab chiqish, milliy standart bilan tafovutlarni aniqlash va daromad hisobini avtomatlashtirish bo‘yicha takliflar berishdan iborat bo‘lib, u BMTning Barqaror rivojlanish maqsadlari (BRM-8, BRM-9, BRM-12) kontekstida korporativ shaffoflik masalasini ham qamrab oladi.

METODOLOGIYA

Tadqiqot metodologiyasi umumilmiy va maxsus iqtisodiy-buxgalteriya tahlil usullariga asoslanadi. Milliy BHMS (4-son va 21-son) hamda MHXS 15 matnini o‘rganishda tahliliy qiyoslash usuli qo‘llanildi. Induksiya usuli yordamida tarmoqdagi amaliy holatlar umumlashtirilib, kon-metallurgiya korxonalari uchun xarakterli tendensiyalar aniqlandi, deduksiya usuli esa besh bosqichli modelni NKMK faoliyatining aniq holatlariga tatbiq etishda qo‘llanildi. Tizimli yondashuv daromadni tan olish jarayonini korxonaning umumiy moliyaviy boshqaruvi bilan bog‘liqlikda ko‘rib chiqishga imkon berdi.

NKMK bo‘yicha rasmiy statistik ma’lumotlarning cheklanganligini hisobga olib, amaliy qismda gipotetik modellashtirish (illustrative case modelling) usuli qo‘llanildi: tarmoq o‘rtacha ko‘rsatkichlari asosida shartli-hisob ma’lumotlari ishlab chiqildi, bu maxfiy korporativ ma’lumotlarni oshkor qilmagan holda standartning amaliy qo‘llanilishini ko‘rsatishga xizmat qiladi. Manba bazasini IASB hujjatlari, O‘zbekiston Moliya vazirligi me’yoriy hujjatlari, Big Four uslubiy qo‘llanmalari va ilmiy nashrlar tashkil etdi.

NATIJALAR VA TAHLILLAR

Qiyoslash natijalari milliy standartlar bilan MHXS 15 o‘rtasida bir qator tafovutlar mavjudligini ko‘rsatdi. Eng muhim farq — tan olish mezonining o‘zida: milliy amaliyotda daromad ko‘pincha mahsulot jo‘natilishi faktiga bog‘lansa, MHXS 15 nazoratning xaridorga o‘tish momentini asos qilib oladi (substance over form tamoyili). Asosiy tafovutlar 1-jadvalda umumlashtirilgan.

1-jadval.

BHMS va MHXS 15 talablari o‘rtasidagi tafovutlar

Mezon	**Milliy BHMS amaliyoti**	**MHXS 15 talabi**
Tan olish asosi	Jo‘natish/bajarilish fakti	Nazoratning xaridorga o‘tishi
Kontseptual model	Yagona, batafsillashtirilmagan qoida	Besh bosqichli model

Ko‘p elementli shartnomalar	Alohida tartibga solinmagan	Har bir ijro majburiyati alohida ajratiladi
O‘zgaruvchan narx	Yakuniy hisob-fakturaga ko‘ra	Eng ehtimolli/kutilayotgan qiymat usulida, cheklanadi
Uzoq muddatli shartnomalar	Yagona vaqt nuqtasida	Davr mobaynida yoki vaqt nuqtasida
Oshkoralik	Cheklangan izoh	Kengaytirilgan izohlar talab etiladi

Jadvaldan ko‘rinadiki, milliy amaliyot yuridik-formal yondashuvga, MHXS 15 esa iqtisodiy mazmun va nazorat mezoniga asoslanadi. Bu farq NKMK kabi ko‘p bosqichli korxonalar uchun moliyaviy natijalarning davrlar kesimida boshqacha taqsimlanishiga olib kelishi mumkin.

MHXS 15 bo‘yicha daromadni tan olish besh bosqichdan iborat bo‘lib, ularni NKMKning tipik uzoq muddatli metall yetkazib berish shartnomasi misolida 2-jadvaldagidek talqin qilish mumkin.

2-jadval.

MHXS 15 asosida NKMK faoliyati mazmuni

№	**Bosqich**	**NKMK faoliyatidagi mazmuni**
1	Shartnomani aniqlash	Xorijiy xaridor bilan oltin/kontsentrat yetkazib berish bo‘yicha aniq shartnoma (miqdor, sifat, narx, muddat)
2	Ijro majburiyatlarini aniqlash	Yetkazib berish, sifat sertifikatlari, transport-logistika xizmati alohida ajratiladi
3	Operatsiya narxini aniqlash	LBMA birja narxlari, valyuta kursi va sifat chegirma/ustamalari hisobga olinadi

4	Narxni taqsimlash	Alohida sotish narxlari (stand-alone selling price) nisbatida taqsimlanadi
5	Daromadni tan olish	Nazorat portda/chegarada (FOB/CIP) o‘tgan vaqtda yoki bajarilish darajasiga mutanosib davr mobaynida

Ushbu model NKMK kabi korxonalarga shartnoma tuzilmasidagi har bir komponentni alohida qiymatga ega ob’ekt sifatida baholash imkonini beradi: qo‘shimcha xizmatlar (masalan, sifat nazorati) alohida ijro majburiyati sifatida ajratiladi va daromad faqat tegishli majburiyat bajarilgandan so‘ng tan olinadi — bu daromadni erta yoki kech tan olish xavfini kamaytiradi.

Amaliy qo‘llanilishni ko‘rsatish uchun shartli holat modellashtirildi: NKMK xorijiy xaridor bilan umumiy qiymati 1 200 000 AQSh dollari bo‘lgan shartnoma tuzgan, unda ikkita ijro majburiyati mavjud — kontsentratni yetkazib berish (alohida sotish narxi 1 100 000 dollar, 91,7%) va sifatni tasdiqlovchi texnik xizmat (100 000 dollar, 8,3%). Nazorat xaridorga port terminalida (CIP) o‘tgani va texnik xizmat alohida davr mobaynida ko‘rsatilgani sababli, daromad ikki bosqichda — yetkazib berilgan kunda 1 100 000 dollar va xizmat yakunlangach 100 000 dollar — tan olinadi. Tegishli provodkalar 3-jadvalda keltirilgan.

3-jadval.

Buxgalteriya provodkalari

Debet	**Kredit**	**Mazmuni**	**Summa, $**
4010	9030/6410	Shartnoma aktivi tan olinishi	1 200 000
4010	9030	Yetkazib berilgan kunda daromad tan olinishi	1 100 000
9110	1000/1500	Mahsulot tannarxining hisobdan chiqarilishi	(shartli)

4010	9030	Texnik xizmat yakunlangach daromad tan olinishi	100 000
5110	4010	Xaridordan pul mablag‘i kelib tushishi	1 200 000

Agar korxona MHXS 15ni e’tiborga olmay, butun summani yetkazib berish sanasida bitta yozuv bilan tan olganida, bu hali bajarilmagan majburiyat bo‘yicha daromadni muddatidan oldin tan olishga olib kelar edi. Besh bosqichli model daromad va xarajatlarning davrlar bo‘yicha mutanosib taqsimlanishini (matching principle) ta’minlaydi — bu investorlar uchun moliyaviy natijaning real manzarasini beradi.

Raqamli transformatsiya sharoitida MHXS 15ning ko‘p bosqichli mantig‘ini qo‘lda hisoblash xatolik xavfini oshiradi. Shu sababli quyidagi takliflar ishlab chiqildi: 1) ERP tizimlariga (1C:ERP, SAP S/4HANA) integratsiyalashgan “Contract & Revenue Management” modulini joriy etish; 2) mashinaviy o‘qitish algoritmlari yordamida stand-alone selling price’ni bashorat qilish modelini yaratish; 3) daromadni erta/kech tan olish holatlarini real vaqtda aniqlaydigan sun’iy intellekt tizimini joriy etish. Bunday avtomatlashtirish hisob sifatini oshiradi va BRM-9 hamda BRM-12 maqsadlariga muvofiq korporativ shaffoflikni kuchaytiradi, shuningdek auditorlik xarajatlarini qisqartirishga xizmat qiladi.

XULOSA

Tadqiqot natijalari milliy BHMS bilan MHXS 15 o‘rtasidagi kontseptual tafovutlarning NKMK kabi tog‘-kon-metallurgiya korxonalari moliyaviy hisobotiga sezilarli ta’sir ko‘rsatishini ko‘rsatdi. Besh bosqichli model asosidagi gipotetik tahlil daromadni ijro majburiyatlari bo‘yicha ajratib tan olish yondashuvi moliyaviy natijalarning davrlar kesimida aniqroq taqsimlanishini ta’minlashini va hisobotning xalqaro investorlar uchun ishonchliligini oshirishini tasdiqladi.

Amaliy tavsiyalar: 1) shartnomalarni ijro majburiyatlari kesimida tasniflash bo‘yicha ichki uslubiy qo‘llanma ishlab chiqish; 2) buxgalteriya xodimlarini

MHXS 15 bo‘yicha malaka oshirish tizimiga jalb etish; 3) ERP tizimlariga integratsiyalashgan avtomatlashtirilgan daromad hisobi modulini joriy etish; 4) shartnoma aktivlari va majburiyatlari bo‘yicha kengaytirilgan izohlar taqdim etish amaliyotini kuchaytirish. Bu chora-tadbirlar korxonaning moliyaviy shaffofligi, investitsiyaviy jozibadorligi va barqaror rivojlanish ko‘rsatkichlarini yaxshilashga xizmat qiladi. Kelgusi tadqiqotlar NKMKning haqiqiy moliyaviy ma’lumotlari asosida chuqurroq empirik tahlilga, shuningdek boshqa tarmoq korxonalari bilan solishtirma tahlilga qaratilishi mumkin.

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STRUCTURAL TRANSFORMATION OF THE ELECTRICITY SECTOR IN UZBEKISTAN AND THE ROLE OF QASHQADARYO REGION: A STATISTICAL AND CORRELATION ANALYSIS

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Abstract. *This article examines the structural transformation of Uzbekistan's electricity sector between 2016 and 2024, with particular attention to the position of Qashqadaryo region home to the Talimarjan Thermal Power Plant and the Hisorak Hydropower Plant within the national energy system. Using official statistical data published by the National Statistics Committee of the Republic of Uzbekistan, the study applies descriptive statistical analysis, dynamic (time-series) analysis, structural (share) analysis and Pearson correlation analysis to assess (i) the evolution of installed generation capacity by source, (ii) the growth of solar and wind electricity production, (iii) Qashqadaryo's share in national electricity output, and (iv) the relationship between regional GDP dynamics and electricity production dynamics. The results show that the share of solar and wind capacity in the national generation mix rose from a negligible level in 2021 to 12.5% in 2024, while renewable electricity output increased more than eightyfold over the same period, indicating an accelerating energy transition.*

Keywords: *electricity generation structure; renewable energy; regional energy economics; Qashqadaryo; Uzbekistan; correlation analysis; energy-GDP nexus*

INTRODUCTION

Ensuring a stable, efficient and increasingly low-carbon electricity supply is a central element of Uzbekistan's national development strategy. Over the past decade, the country has pursued a deliberate diversification of its power generation mix away from an almost exclusive reliance on thermal power plants toward a mix that increasingly incorporates hydropower, solar photovoltaic and wind generation, in line with national decrees on the development of renewable

energy sources and the broader regional trend across Central Asia toward reducing dependence on hydrocarbon-based electricity generation[5]. At the same time, the electricity sector in Uzbekistan exhibits pronounced regional heterogeneity: individual regions differ substantially in their generation capacity, their contribution to national output, and the pace at which they participate in the ongoing energy transition. Qashqadaryo region occupies a distinctive position in this respect. It hosts two of the country's most significant generation assets the Talimarjan Thermal Power Plant, one of the largest thermal facilities in Central Asia, and the Hisorak Hydropower Plant and consequently contributes a disproportionately large share of national electricity production relative to its share of national economic output. Understanding the dynamics of this contribution, and its relationship to the region's broader economic development, is a prerequisite for designing effective regional energy policy.

Prior research on energy efficiency in Central Asia and the post-Soviet space has increasingly applied quantitative benchmarking methods most notably Data Envelopment Analysis (DEA) and related non-parametric efficiency frontiers to evaluate the performance of energy systems at the national and regional level (e.g. Ratner, 2017[6]; Pokushko & Stupina, 2019[7], among others working on DEA-based energy efficiency assessment in the CIS). Uzbek-language scholarship has begun to extend this tradition to the national context (Mirzaxalilova, 2024[8]; Akromov et al., 2022), while international agencies such as the International Energy Agency (IEA) and the World Economic Forum's Energy Transition Index (WEF ETI) provide comparative benchmarks for energy intensity and transition readiness. However, region-specific structural and correlation analysis of the electricity sector particularly for Qashqadaryo,

[5] https://energyforum.uz/en/news/green-energy-generation-in-uzbekistan-since-the-beginning-of-the-year-amounted-to-1-billion-kwh

[6] https://www.scirp.org/reference/referencespapers?referenceid=2659454

[7]https://www.researchgate.net/publication/341740295_Data_Envelopment_Analysis_in_Performance_Assessment_of_Fuel_and_Energy_Complex_Enterprises

[8] Mirzaxalilova Azizaxon Alisherovna. O’zbekiston yoqilg‘i-energetika majmui korxonalarining barqaror rivojlanishini ta’minlash mexanizmlarini takomillashtirish. PhD dissertatsion

one of Uzbekistan's principal energy-producing regions remains scarce in the peer-reviewed literature, constituting a clear research gap that this study aims to address.

The aim of this article is threefold: (1) to document the structural transformation of Uzbekistan's electricity generation capacity and output between 2016 and 2024, with emphasis on the emergence of solar and wind generation; (2) to quantify Qashqadaryo region's contribution to, and volatility within, national electricity production over the same period; and (3) to test, using correlation analysis, whether regional and national electricity production growth is statistically associated with regional and national GDP growth, thereby providing an empirical starting point for a broader investigation into the mechanism of energy resource utilisation in regional economic development.

METHODS

The study relies exclusively on official statistical indicators published by the National Statistics Committee of the Republic of Uzbekistan , accessed through its SDMX-format open-data indicator system. The following annual indicators were used for the period 2016-2024 (unless otherwise noted): (a) total installed capacity of power plants, MW; (b) installed capacity of thermal power plants, MW; (c) installed capacity of hydropower plants, MW; (d) total volume of electricity production, million kWh; (e) volume of electricity production by solar power plants, million kWh; (f) volume of electricity production by wind power plants, million kWh; (g) volume of electricity production in Qashqadaryo region, million kWh; and (h) nominal gross regional product (GRP) of Qashqadaryo region and nominal GDP of the Republic of Uzbekistan, billion soums, for 2016-2025. Where 2025 regional and structural indicators had not yet been published in the official indicator system at the time of writing, the analysis was restricted to the latest available year, 2024, and this limitation is noted explicitly.

In article, complementary methods of analysis were applied: Descriptive statistical analysis computation of levels, absolute changes and multiplicative growth factors for capacity, production and GDP indicators over the study period. Dynamic (time-series) analysis year-on-year growth rates were calculated and compound growth over multi-year sub-periods was calculated as a growth factor. Structural (share) analysis the share of each generation source i in total capacity or production was calculated , applied separately to installed capacity (thermal, hydro, solar+wind) and to electricity production (conventional, solar, wind), and to Qashqadaryo's share of national electricity production and national GDP. Correlation analysis the Pearson product-moment correlation coefficient, $r = \Sigma(x_i-\bar{x})(y_i-\bar{y}) / \sqrt{[\Sigma(x_i-\bar{x})^2\Sigma(y_i-\bar{y})^2]}$, was used to test the linear association between (a) national year-on-year GDP growth and national year-on-year electricity production growth, (b) regional (Qashqadaryo) GDP growth and regional electricity production growth, and (c) the level of Qashqadaryo's GDP share and the level of its electricity production share across the study years.

All computations were performed on the raw published indicator values without seasonal or inflation adjustment; because gross domestic/regional product is reported in nominal (current-price) terms while electricity output is a physical quantity, this distinction is addressed explicitly when interpreting the correlation results

RESULTS

National installed electricity generation capacity increased from 14,102.1 MW in 2016 to 21,501.4 MW in 2024, a 1.52-fold increase. Throughout most of the period, thermal power plants dominated the capacity mix: their share stood at 86.67% in 2016 and remained above 85% through 2021. A pronounced structural shift occurred from 2022 onward, when the combined share of solar and wind capacity rose from near zero to 1.22% in 2023 and then sharply to 12.48% in 2024, corresponding to the commissioning of several large-scale solar

and wind facilities. The thermal share correspondingly fell to 72.94% by 2024, while the hydropower share remained comparatively stable, moving from 13.33% to 14.58% (Fig. 1, Table 1).

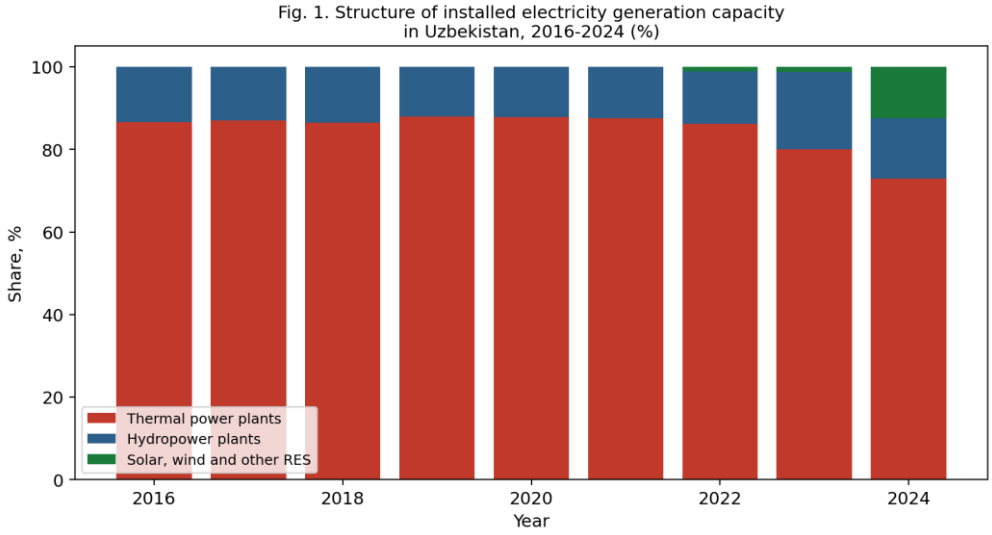

Fig. 1. Structure of installed electricity generation capacity in Uzbekistan, 2016-2024 (%).

Source: authors' calculation based on stat.uz data.

Total national electricity production rose from 59,100.5 million kWh in 2016 to 82,739.7 million kWh in 2024 (a factor of 1.40), a substantially slower rate of increase than installed capacity, reflecting the gradual ramp-up of newly commissioned plants to full output. The share of solar and wind sources in total production remained below 0.1% until 2021 and then rose to 5.75% by 2024. In absolute terms, solar electricity output increased from 49 million kWh in 2021 to 3,965.2 million kWh in 2024 — an approximately 81-fold increase — while wind output rose from 1.2 million kWh to 789.6 million kWh, a roughly 658-fold increase (Fig. 2). These figures indicate that, unlike the relatively gradual structural change observed in installed capacity, the growth of actual renewable electricity output has been markedly non-linear, consistent with a small number of large facilities being commissioned in rapid succession rather than a smooth, continuous expansion.

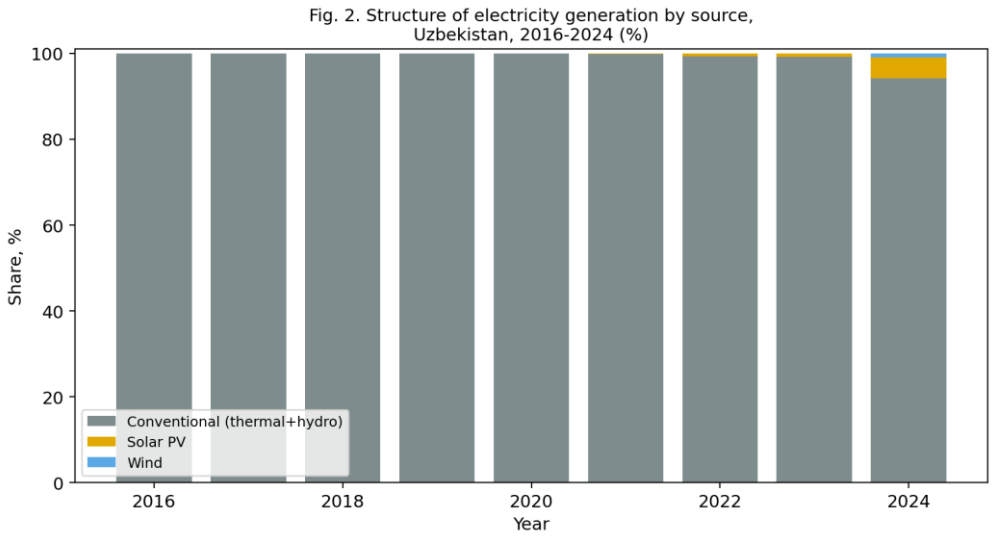

Fig. 2. Structure of electricity generation by source, Uzbekistan, 2016-2024 (%). Source: authors' calculation based on stat.uz data.

Qashqadaryo region's share of national electricity production fluctuated considerably over the study period, ranging from a minimum of 10.48% (2023) to a maximum of 22.04% (2018), with an average of 16.00% across 2016-2024 (Fig. 3, Table 2). This volatility in contrast to the more gradual national-level trends described above appears to reflect variation in the utilisation and technical availability of the region's generation assets (notably the Talimarjan Thermal Power Plant) rather than a structural or policy-driven trend, and points to the region's electricity output being more sensitive to plant-level operational factors than the national aggregate.

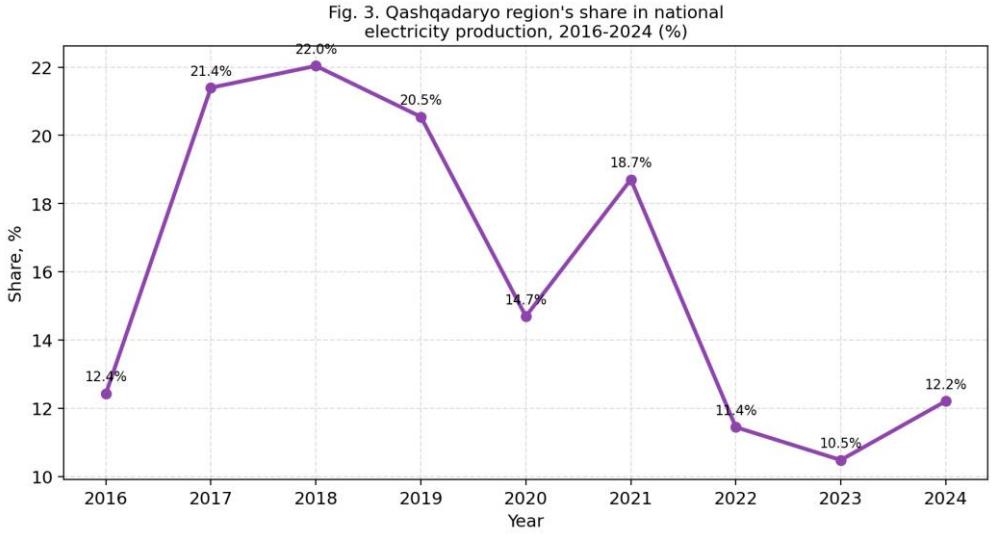

Fig. 3. Qashqadaryo region's share in national electricity production, 2016-2024 (%). Source: authors' calculation based on stat.uz data.

A comparison of Qashqadaryo's share in national electricity production with its share in national GDP reveals a marked asymmetry (Fig. 4). Whereas the region's electricity production share averaged 16.00% over 2016-2024, its share of national GDP averaged only 6.30% and, moreover, declined steadily from 8.18% in 2016 to 5.34% in 2025 (using the most recently available GDP figures). This indicates that Qashqadaryo contributes to national electricity generation roughly two-and-a-half times more, proportionally, than it contributes to national economic output consistent with the region's role as a net electricity-exporting production hub rather than a proportionally large final consumer or diversified economic centre.

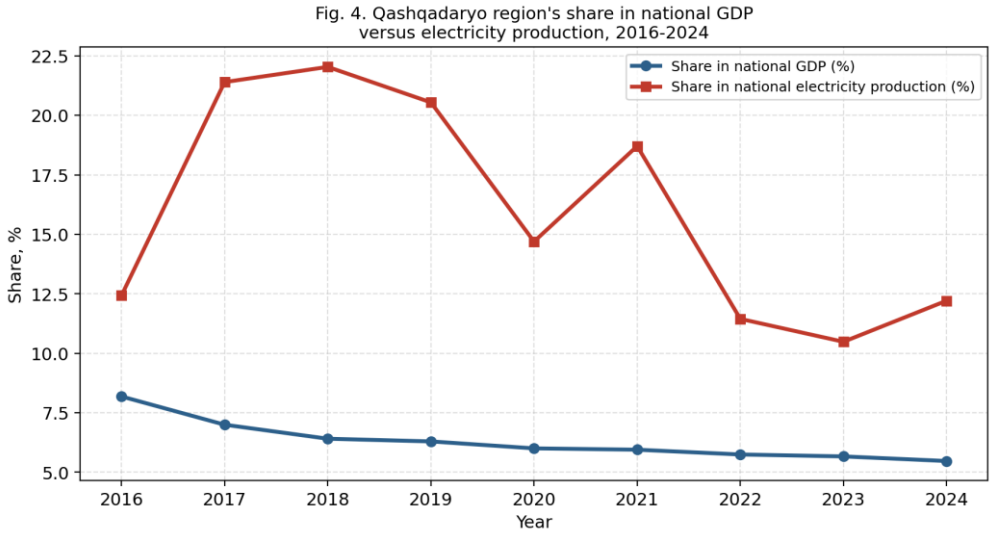

Fig. 4. Qashqadaryo region's share in national GDP versus electricity production, 2016-2024. Source: authors' calculation based on stat.uz data.

Indicator	2016	2024	Change
Total installed capacity, MW	14,102.1	21,501.4	1.52
Thermal power plants share, %	86.67	72.94	-13.72 %.
Hydropower share, %	13.33	14.58	1.24 %.
Solar + wind capacity share, %	0.00	12.48	+12.48 %
Total electricity production, mln kWh	59,100.5	82,739.7	1.40

Indicator	2016	2024	Change
Renewable (solar+wind) share of production, %	0.001	5.75	+5.75 %
Qashqadaryo share in national electricity production, %	12.43	12.21	-0.22 %.
Qashqadaryo share in national GDP, %	8.18	5.47	-2.71 %

Year	National capacity, MW	National production, mln kWh	Qashqadaryo production, mln kWh	Qashqadaryo share in electricity production, %	Qashqadaryo share in GDP, %
2016	14,102.1	59,100.5	7,344.3	12.43	8.18
2017	14,373.9	60,820.1	13,014.0	21.40	6.99
2018	14,191.4	62,896.6	13,860.2	22.04	6.40
2019	15,939.4	63,531.6	13,052.3	20.54	6.29
2020	16,643.0	66,500.7	9,770.7	14.69	6.00
2021	16,493.3	71,364.6	13,349.7	18.71	5.94
2022	17,658.9	74,269.3	8,499.0	11.44	5.74
2023	20,400.5	78,005.4	8,174.9	10.48	5.66
2024	21,501.4	82,739.7	10,099.9	12.21	5.47

Table 2. Annual capacity, production and share indicators, 2016-2024

Correlation between GDP growth and electricity production growth. Pearson correlation analysis of year-on-year growth rates for 2017-2024 shows a weak negative association between national nominal GDP growth and national electricity production growth (r = -0.41), and a similarly weak negative association at the regional level between Qashqadaryo's GDP growth and its electricity production growth (r = -0.19). At the level of shares (rather than growth rates), the correlation between Qashqadaryo's GDP share and its electricity production share across 2016-2024 is weakly positive (r = 0.20). None of the three coefficients indicates a strong linear relationship.

As a complementary perspective on the demand side, official data on the structure of electricity supply (consumption) by economic sector at the national level show that the share of the population and services sector rose from 44.3% of total supply in 2016 to 55.3% in 2024, while the share of industry declined

from 36.5% to 31.1% and the share of agriculture declined from 16.5% to 11.3% over the same period; construction and transport each accounted for under 2% throughout. Per-capita electricity supply rose from 1.8 thousand kWh in 2016 to 2.2 thousand kWh in 2024, a 22.2% increase, consistent with rising household electricity consumption nationally.

DISCUSSION

The results point to two energy transitions proceeding at different speeds. The transition in installed capacity where renewables reached 12.5% of the national total by 2024 has outpaced the transition in actual output, where renewables reached only 5.75% of production in the same year. This gap between capacity share and production share is consistent with newly commissioned solar and wind plants not yet operating at their full annual capacity factor in their first full year, and it implies that the renewable share of output can be expected to continue rising substantially in subsequent years purely as a function of existing (rather than additional) installed capacity reaching normal utilisation.

Qashqadaryo's persistently higher and more volatile share of national electricity production relative to its share of national GDP is consistent with its role as a specialised, capital-intensive energy-production hub rather than a broadly diversified regional economy. This has two policy implications. First, because a large share of the region's economic activity, in a broad sense, is tied to the performance of a small number of large generation facilities, national-level fluctuations in fuel supply, maintenance schedules, or dispatch decisions at these facilities are likely to have a disproportionate effect on the region's measured electricity output and, by extension, on any regional indicators derived from it. Second, the gap between the region's electricity-production share and its GDP share suggests that a substantial portion of the value associated with the region's electricity generation accrues outside the region for example, through wholesale electricity pricing and transmission to other regions a pattern that merits further

investigation using regional value-added accounting rather than production-volume data alone.

The weak, and in the case of growth rates, negative correlation between GDP growth and electricity production growth should be interpreted cautiously. Because GDP and GRP are reported in current (nominal) prices, their year-on-year growth rates partly reflect inflation rather than real output growth; national nominal GDP growth in the sample ranged from 13.7% to 33.9% per year, figures well in excess of plausible real growth, indicating a strong inflationary component. Physical electricity production, by contrast, is not subject to this distortion. The observed weak/negative correlation is therefore more plausibly explained by this measurement mismatch — and, to a lesser extent, by structural improvements in energy efficiency that would allow real GDP to grow without a proportional increase in electricity consumption than by a genuine decoupling of economic activity from electricity use. A more rigorous test of the energy-GDP nexus for Qashqadaryo would require real (inflation-adjusted or constant-price) regional GDP series and, ideally, energy-intensity indicators (electricity consumption per unit of real GRP) of the kind more commonly used in the energy economics literature; this is identified as a priority for future research and is consistent with the broader dissertation-level analysis of energy resource utilisation mechanisms in Qashqadaryo region, of which this article forms a preliminary empirical component.

These findings should also be read in light of several limitations. First, the study period is constrained by data availability: regional and structural electricity indicators for 2025 had not yet been published in the official statistical database at the time of writing, and only preliminary aggregate national figures (reported by the Ministry of Energy) were available for that year. Second, the analysis is based on nominal GDP; as discussed above, this limits the interpretability of the correlation results and should be addressed in follow-up work using deflated series. Third, the correlation analysis presented here is univariate and does not

control for other determinants of electricity production (e.g. maintenance downtime, export contracts, weather-dependent hydropower and renewable output); a multivariate regression framework, of the kind more commonly applied in regional energy-efficiency studies using DEA or panel-data methods, would allow these factors to be disentangled and is a natural extension of the present analysis.

CONCLUSION

This study documents a clear structural transformation in Uzbekistan's electricity sector between 2016 and 2024, characterised by a rapid, if still incomplete, shift toward solar and wind generation: the renewable share of installed capacity rose from near zero to 12.5%, and the renewable share of actual electricity production rose to 5.75%, driven by an approximately 81-fold increase in solar output and a 658-fold increase in wind output since 2021. Within this national picture, Qashqadaryo region emerges as a disproportionately important electricity-producing region, averaging 16.0% of national electricity production more than double its 6.3% average share of national GDP while also exhibiting substantially greater year-to-year volatility than the national aggregate. Correlation analysis finds no strong linear relationship between GDP growth and electricity production growth at either the national or the regional level, a result attributable in large part to the nominal (inflation-affected) nature of the GDP series rather than to a genuine absence of an energy-growth relationship.

From a policy perspective, these findings support the case for region-specific measures to stabilise and improve the efficiency of electricity generation in Qashqadaryo including the modernisation of existing thermal and hydropower assets at Talimarjan and Hisorak, the expansion of solar and wind capacity to diversify the region's generation portfolio in line with the national trend, and the development of regional value-added accounting that would allow the economic contribution of the region's electricity sector to be assessed independently of

production volume alone. Future research should extend the correlation analysis presented here using real (constant-price) regional GDP and multivariate or panel-data methods, and should incorporate efficiency-frontier techniques such as Data Envelopment Analysis to benchmark Qashqadaryo's generation assets against comparable regional and international facilities.

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6-SECTION

THE ROLE OF DIGITAL TECHNOLOGIES IN TEACHING HISTORY BASED ON AN INTERDISCIPLINARY INTEGRATIVE APPROACH

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Abstract. *The growing use of digital technologies has transformed history education. Combined with an interdisciplinary integrative approach, digital tools enable students to connect historical knowledge with geography, literature, economics, political science, sociology, art, and information technology. This article examines how digital technologies support historical thinking, source analysis, independent learning, and the integrated study of complex historical processes. It also identifies the pedagogical conditions required for their effective use.*

Keywords: *digital technologies, history teaching, interdisciplinary integration, historical thinking, digital resources.*

INTRODUCTION

History education is no longer limited to memorizing dates, events, and biographies. Modern teaching requires students to understand historical processes, identify causal relationships, compare periods, evaluate evidence, and form well-reasoned conclusions. These tasks require subject knowledge and the ability to connect history with other fields. The interdisciplinary integrative approach has therefore become an important principle of contemporary history education. Digital technologies expand the possibilities of this approach. Digital archives, interactive maps, virtual museums, timelines, multimedia materials, educational platforms, and data visualization tools allow students to study the past through different forms of evidence. They create conditions for active, inquiry-based, and collaborative learning. Digital technologies therefore function as pedagogical instruments for understanding historical reality.

History is inherently interdisciplinary because every historical process includes political, economic, social, cultural, geographical, technological, and ideological dimensions. A war must be examined through diplomacy, economics, geography, technology, and social psychology. Similarly, a civilization must be studied through its environment, trade, beliefs, science, art, and governance. An interdisciplinary integrative approach enables students to study historical events as complex and interconnected phenomena. Geography explains how natural conditions influence development. Economics reveals the role of production, trade, taxation, and inequality. Literature and art reflect the worldview and values of an era. Political science supports the analysis of power and institutions, while sociology helps explain social structure and collective behavior. Digital technologies bring this information into a single learning environment.[9] While studying the Silk Road, students may trace routes, examine artifacts, analyze trade, read travelers' accounts, and compare cultural influences. The lesson becomes a multidimensional investigation rather than a simple narrative.

One of the most important functions of digital technology is providing access to historical sources. Digitized manuscripts, newspapers, photographs, maps, letters, legal documents, statistical records, and audiovisual archives allow students to work directly with primary evidence. Students thereby learn that historical knowledge is constructed through interpreting evidence rather than received as unquestionable fact. Digital archives also facilitate comparative and interdisciplinary analysis. A student studying industrialization may examine factory photographs, workers' memoirs, demographic statistics, urban maps, literary texts, and economic reports. By comparing these materials, the student understands industrialization as a technological, economic, social, and cultural process. Interactive maps visualize historical change in space and time, including

[9] Stevens, L., Wood-Nartker, J., Hall, M., & Zuo, J. (2008). Integrating Technology as an Interdisciplinary Approach to History and Culture. International Journal of Technology, Knowledge and Society, 4(6), 107.

territorial expansion, migration, trade, military campaigns, and cultural diffusion. Digital timelines allow learners to place political events, scientific discoveries, social movements, and cultural developments within the same chronological framework.[10] This reveals continuity, simultaneity, and interaction among different areas of historical development. Virtual museums and three-dimensional reconstructions support experiential learning. Students can explore monuments, ancient cities, archaeological sites, and collections that may be geographically inaccessible. When combined with tasks in architecture, art history, archaeology, and geography, such environments deepen visual and spatial understanding.

The interdisciplinary use of digital technologies develops several important skills. First, it strengthens source criticism. Students must identify a source's author, date, purpose, audience, context, and reliability. This is especially important online because information may be incomplete, manipulated, biased, or historically inaccurate.

Second, digital learning supports comparison and interpretation. Students can compare several accounts of the same event, examine different maps, and evaluate contrasting explanations. They learn to distinguish historical evidence from interpretation and understand that the same event may be viewed differently by different societies or groups.

Third, digital tools support causal reasoning. Concept maps, diagrams, and data visualizations help students identify long-term and short-term causes, direct and indirect consequences, and relationships among political, economic, social, and cultural factors. Historical explanation therefore becomes more systematic and less dependent on memorized conclusions.[11]

[10] Solsona-Puig, J. (2026). Immersive media technology (imt) in teaching history: exploring elementary pre-service teachers' perceptions integrating technology. The Social Studies, 117(1), 17-32.
[11] Fakude, N. L. (2023). Integrating Digital technology in teaching History in the Primary School (Doctoral dissertation, University of Johannesburg).

Fourth, digital technologies promote communication and collaboration. Students may create presentations, podcasts, videos, online exhibitions, or group research projects. Through these tasks, they learn to organize evidence, construct arguments, communicate findings, and take responsibility for shared work.[12]

The effectiveness of digital and interdisciplinary history teaching depends largely on the teacher's competence. The teacher must select reliable resources, connect them with curricular objectives, and design tasks that require analysis rather than passive observation. Simply showing a video does not create meaningful learning. Technology becomes educationally valuable only when it supports a clear historical question, active inquiry, and reflection. Teachers must guide learners in evaluating online sources, recognizing misinformation, respecting copyright, and using digital information ethically. Interdisciplinary links should deepen historical understanding rather than distract from it. Every digital activity must therefore be connected to a specific historical concept, problem, or research task. Practical challenges may limit implementation. Unequal access to devices and internet services can reduce participation. Teachers may lack technical training or preparation time. Students may focus on visual effects, while excessive information can obscure relevant evidence. These challenges require institutional support, teacher training, reliable infrastructure, and carefully designed assessment. Assessment should measure historical reasoning, source use, interpretation, creativity, and interdisciplinary connections rather than factual recall alone. Source analysis, comparative essays, digital exhibitions, research projects, and evidence-based presentations are suitable for this purpose.

CONCLUSION

Digital technologies play a transformative role in teaching history through an interdisciplinary integrative approach. They expand access to sources,

[12] Johnson, C. C., & Czerniak, C. M. (2023). Interdisciplinary approaches and integrated STEM in science teaching. In Handbook of research on science education (pp. 559-585). Routledge.

connect different fields of knowledge, visualize complex processes, and support inquiry-based learning. Through archives, interactive maps, timelines, virtual museums, multimedia projects, and collaborative platforms, students can study historical events as multidimensional phenomena rather than isolated facts. Most importantly, digital technologies contribute to historical thinking, critical analysis, source literacy, creativity, and independent learning. Their effectiveness depends on thoughtful pedagogical design, teacher competence, reliable resources, and clearly defined interdisciplinary objectives. When these conditions are met, digital technology makes history education more engaging, evidence-based, connected, and intellectually meaningful.

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MODEL OF METACOGNITIVE COMPETENCE FORMATION IN FUTURE PRESCHOOL TEACHERS

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Abstract. *The article considers the problem of professional education of future preschool teachers, marks the insufficient involvement of future specialists into educational process. The article presents the definition of metacognitive competence; singles out its specificity related to preschool teachers; describes the components of metacognitive competence of preschool teachers including cognitive, operationaltechnological and motivationalvolitional. It substantiates the necessity of including the process of forming metacognitive competence in the educational process of a professional education establishment. It presents a model of forming metacognitive competence in future preschool teachers, describes its blocks – target, conceptual, content and diagnostic ones. The model of forming metacognitive competence in future preschool teachers is based on the ideas of personality's activity, inclusion and forming into activity and is built in the logic of fourdimensional model of education.*

Keywords*: metacognitive competence, components of metacognitive competence, forming metacognitive competence, professional education, preschool teacher, metacognitive competence of future preschool teacher.*

INTRODUCTION

One of the urgent tasks of modern education is the formation of the "ability to learn". Today, there is a demand for a specialist who is not "filled with knowledge", but is able to apply personal experience, acquired knowledge and skills in various situations: standard, due to the variety of factors and their combinatorics, and non-standard, requiring a different view of solving emerging problems.

The content of vocational education included in the curricula for the training of future preschool educators does not fully meet the requirements of modernity due to the lag behind scientific discoveries in psychological and pedagogical science, on the one hand, and with a certain impersonality of the educational material, its weak connection with the personal meanings, values of the student, his insufficient involvement in the simulated professional activity, on the other.

In the context of professional pedagogical training of future preschool educators, the system of ideas, skills and abilities formed in them, as well as professionally important personal qualities, is described in the educational standard [1]. However, in our opinion, the implementation of the educational standard requires the inclusion of a component that would ensure not so much the "filling" of the student with knowledge and skills, but his involvement in the educational process through personal qualities and values. Such a component is represented by the metacognitive competence of the student.

MAIN PART

By the metacognitive competence of a teacher, we mean the ability to understand and evaluate the features of their cognitive, value-motivational sphere and use this data in the creative solution of professional pedagogical problems, as well as in the construction of an individual trajectory of self-development and self-improvement. Its composition is based on the cognitive component as the basis for the formation of skills, that is, the operational and technological component that determines the practical implementation of the knowledge, the motivational component is a regulator of the cognitive and operational-technological components.

The metacognitive competence of a preschool teacher has its own specifics, which stem from the essential content of his professional functions. The activity of a preschool teacher is specific due to the "subjectivity" of the object of work and its age characteristics, which imply the organization of the

educational process through various types of children's activities, primarily play and work. The implementation of the professional functions of the educator is carried out through the individual style of pedagogical activity. At the same time, the effectiveness of solving professional problems in the activities of a preschool teacher depends on the ability to integrate various individual styles of pedagogical activity, depending on the combination of factors that determine the strategies of activity. Specific in the metacognitive competence of a preschool teacher is the analysis and determination of factors that directly affect the solution of a pedagogical problem. The period of early and preschool childhood is one of the most susceptible to external conditions and interaction, which is due to the stage of the child's entry into society (mastering social norms and rules of behavior). cognition of the world and the development of social experience through various types of children's activities. The interaction of the teacher with children is built in the context of play activity as the leading one in the period of preschool childhood, and the integration of various activities into the game.

Therefore, the specificity of the metacognitive competence of a preschool teacher, in contrast to the metacognitive competence of another education specialist, consists in the creative solution of pedagogical problems, ensuring the consideration of the most significant factors affecting the effectiveness of solving the pedagogical problem, as well as the use of the most optimal combination of the individual style of pedagogical activity with the game component as basic and necessary in interaction with the child early and preschool age. The metacognitive competence of a preschool teacher is aimed at constructing an individual trajectory of self-development and self-improvement as a necessary condition for the implementation of pedagogical activities and a condition for maintaining psychological health, which is of particular importance in the context of the nature of professional activity, characterized by empathy, increased emotional tension and a high requirement for self-control. The most effective formation of metacognitive competence in a future preschool

teacher, from our point of view, is to be carried out at the stage of becoming a professional, which corresponds to the period of professional training. In the period of adolescence, the worldview, values and attitudes of the individual are formed, professional training, in turn, contributes to this formation and is determined by the axiological aspect of the future professional.

The process of forming the metacognitive competence of the future preschool teacher can be synchronized with the educational process of the vocational education institution. It can be presented as a specific model that includes target, conceptual, content, and diagnostic blocks.

The model of the formation of metacognitive competence of future preschool teachers is ideologically nourished by the essential provisions about the activity of the individual, his involvement in activities and is built in the logic of the four-dimensional model of education presented by C. Feidl, M. Bialik, B. Trilling [2].

The purpose of the model for the formation of metacognitive competence of future preschool educators is to form metacognitive competence in future preschool educators, which is expressed in the ability to solve professional pedagogical problems creatively, taking into account the flexibility of the individual style of pedagogical activity, as well as in the ability to construct an individual trajectory of self-development and self-improvement, based on the understanding of their own cognitive and value-motivational spheres. The goals are detailed through the following tasks:

1) to form the ability to choose and implement cognitive strategies based on knowledge of the features of their own cognitive sphere;

2) to provide conditions for understanding values, personal qualities, attitudes that affect the cognitive sphere;

3) to form the ability to predict difficulties and determine ways to solve them;

4) to form the ability to construct an individual trajectory of self-development and self-improvement;

5) to form the ability to track and regulate the range of their own emotional states, their impact on the effectiveness of solving the problem.

The conceptual block reveals scientific approaches, methodological foundations for building a model for the formation of metacognitive competence of future preschool educators. Methodological regulations are represented by three levels: philosophical and general scientific, specific scientific and technological, and the principles of implementing the model for the formation of metacognitive competence of future preschool educators.

At the philosophical and general scientific level of the methodology, the conceptual foundations for the development of a model for the formation of metacognitive competence of future preschool teachers are the ideas of modern systems theory, which require consideration of any phenomenon as a self-organized system in the unity of connections of all components, as well as the provision on the activity basis of competence formation. In the light of modern systems theory, the model for the formation of metacognitive competence of preschool teachers is understood as a complex hierarchical structure with various substructures [3–5]. The activity approach considers education as an opportunity to ensure the full development of the personality under the condition of a subjective position regarding one's education. From the standpoint of this approach, competence should be understood as a functional system of the psyche that provides the ability to solve problems of a certain type [6; 7].

At the specific scientific level of the methodology, the conceptual justifications for the development of a model for the formation of metacognitive competence of future teachers of preschool education are: the idea of pedagogical axiology about the value-semantic perception of educational and professional activities by students as a factor of their professional and personal self-development [8] and the idea of reflexivity as a mechanism for the

implementation of voluntary intellectual control over the solution of problem situations (tasks), professional personal development [9; 10]. The ideas of pedagogical axiology are based on the acceptance of the intrinsic value of preschool childhood through the unconditional acceptance of the child, which fills the professional formation of the future preschool teacher with a special meaning. The child is formed and realized in specific types of children's activities, which are educational means for the educator. The ideas of reflectivity ensure the effective use of this tool as the basis of the educational process in a preschool education institution.

At the technological level of the methodology, the conceptual justifications for the development of a model for the formation of metacognitive competence of future preschool teachers are the following theoretical provisions and ideas:

- the idea of developing an individual style of pedagogical activity as the leading goal of professional education. As for the future teacher of preschool education, the priority is the formation of a flexible style of pedagogical activity, which integrates all possible variations on the basis of a game;
- the idea of taking into account personal mental experience as the basis for the conscious organization of one's own intellectual activity [11];
- the idea of step-by-step development of students' metacognitive abilities from self-regulation skills to the skills of reflection and metacognitive analysis.

Cognitive self-regulation is mediated by the understanding of objective reality: in relation to the teacher of preschool education, such reality is the knowledge of the characteristics of the period of early and preschool childhood. The activity of the educator as an organizer of children's activities, as a tutor of the development and upbringing of each child and the children's team as a whole

is subject to reflection. Metacognitive analysis determines the formation of a mental picture of the world centered on the child's personality;

- the idea of stimulating the cognitive activity of the student, aimed at creative solution of problem problems.

Professional education is implemented within the framework of the competence approach and is aimed not at accumulating knowledge, but at forming the ability to solve complex non-standard professional problems, to foresee and prevent them. Professional training of personnel for the field of preschool education should ensure the readiness to solve professional problems specific to future educators.

The principles of the model implementation make it possible to specify the tools for the formation of metacognitive competence of future preschool teachers and include:

1) the principle of flexibility, which involves the implementation of professional activity through the flexible use of various styles of individual pedagogical activity, depending on the leading factors of the performance of professional functions;

2) the principle of integrativity. It is implemented at several levels: methodological, targeted, organizational and activity;

3)The principle of modularity determines the construction of a model of competence formation as stages of mastering the components of competence at the level of building the educational process (theoretical module (academic disciplines) and educational and practical (pedagogical practice)) and at the level of content (mastering the content of an academic discipline by separate interrelated elements - modules);

4) the principle of qualimetric orientation, which is implemented in relation to two modules of the model: theoretical training and pedagogical practice;

5) The principle of differentiation specifies the principle of qualimetric orientation. It allows you to present the target block of the model as an open system of results according to three levels – the first meets the basic (minimum) requirements for the development of the curriculum; the second level is aimed at reflecting the process of forming an individual style of pedagogical activity of future preschool teachers; the third level involves the definition of individual goals professional and personal development by the student himself;

6) the principle of reflexivity allows the future teacher of preschool education to form the ability to most fully and adequately reflect the pedagogical reality in his consciousness;

7) the principle of personalization or axiological mediation refracts the knowledge obtained through the prism of individual and personal characteristics;

8) the principle of project orientation. It involves the use of project activities as an optimal means of forming competence, as a form of organizing pedagogical practice, ensuring an increase in the personal significance of educational and practical activities;

9)the principle of the formation of an individual style of pedagogical activity as an integration of the game position and the axiological sphere of the personality of the preschool teacher. It involves the consideration of the game position of the preschool teacher as the basis of his individual style of pedagogical activity;

10) the principle of cyclicity is based on the works of Diana Lorillard [12], describing ways to involve students in the learning process. It involves the establishment of learning cycles: acquisition of knowledge, discussion, research, practice, cooperation, production;

11) the principle of content balance. The balance of content is based on the discrepancy between the speed of development and approval of curricula of the professional component and scientific developments both in the field of pedagogy, including preschool, and in related sciences.

The content block reflects the directions and forms of work on the implementation of the model for the formation of metacognitive competence of future preschool educators. The educational process in the context of vocational education includes two components – theoretical training and practice. In the model under consideration, professional competence as a system of interrelated mutually influencing components at the level of vocational education is provided by theoretical training, creating its knowledge – cognitive – component, and practice, which makes it possible to fill the operational and technological component. The motivational and volitional component of professional competence is provided by the pedagogical conditions of professional training, including specific forms of training organization, software and methodological support, teaching methods, etc.

The content block integrates several models of learning: personal as leading in the context of the axiological nature of the professional formation of the future educator; developmental, which allows the process of forming metacognitive competence to be implemented in stages - from self-regulation skills to the skills of reflection and metacognitive analysis; activating and enriching, which allow the process of forming metacognitive competence to be implemented by increasing the level of cognitive activity, taking into account individual mental experience.

The modular construction of software and methodological support meets the consistency as a declared characteristic of the model for the formation of metacognitive competence of future preschool teachers and allows all didactic elements to be subordinated to the goal.

The methodological aspect of the content component of the model includes the technology of building mind maps, case technology, project and research technologies, a system of pedagogical tasks and problem situations, and the creation of a portfolio.

The diagnostic block of the model contains criteria for assessing the effectiveness of the formation of metacognitive competence of future preschool educators, corresponding to the components of metacognitive competence. The diagnosed parameters are determined by means of a cumulative index of the formation of metacognitive competence of future preschool educators, the degree of satisfaction of the subjects with the methodology and software and methodological support, the degree of correlation between the level of formed metacognitive competence and motivational readiness for professional pedagogical activity.

CONCLUSION

Thus, the model of the formation of metacognitive competence of the future preschool teacher is a specifically filled and organized educational process that covers theoretical training and pedagogical practice. The presented model essentially corresponds to the specificity of the professional activity of a preschool teacher and fits into the logic of building the educational process of a vocational education institution.

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OLIY TA’LIMDA AMALIY MASHG‘ULOTLARNI TASHKIL ETISHDA PROFESSOR-O‘QITUVCHINING MAHORATI

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Annotatsiya: *Mazkur maqolada OTT sharoitida amaliy mashg‘ulotlarni tashkil etishda professor-o‘qituvchilarning kreativ yondashuvi masalasi ko‘rib chiqiladi.*

Amaliy darslarning samaradorligi ko‘p jihatdan o‘qituvchining darsni qanday tashkil etishi, talabalarda qiziqish uyg‘ota olishi va ularni faol ishtirokga jalb etishiga bog‘liq ekani tahlil qilinadi. Shuningdek, an’anaviy usullardan farqli ravishda kreativ yondashuv asosida tashkil etilgan mashg‘ulotlarning talabalarning mustaqil fikrlashi, muammo yechish ko‘nikmalari va amaliy bilimlarini rivojlantirishdagi o‘rni ochib beriladi. Maqolada real ta’lim jarayonidan kelib chiqib, amaliy mashg‘ulotlarni yanada samarali tashkil etish bo‘yicha taklif va tavsiyalar beriladi.

Kalit so‘zlar: *OTT, amaliy mashg‘ulot, kreativ yondashuv, ta’lim jarayoni, talaba faolligi, innovatsion metodlar, mustaqil fikrlash*

Аннотация: *В данной статье рассматривается проблема креативного подхода профессорско-преподавательского состава к организации практических занятий в условиях ОТТ. Анализируется, что эффективность практических занятий во многом зависит от того, насколько преподаватель способен заинтересовать студентов и вовлечь их в активное участие. Особое внимание уделяется тому, что в отличие от традиционных методов, креативный подход способствует развитию самостоятельного мышления, навыков решения проблем и практических знаний студентов. В статье также приводятся практические рекомендации по повышению эффективности организации занятий на основе реального образовательного опыта.*

Ключевые слова: *ОТТ, практические занятия, креативный подход, образовательный процесс, активность студентов, инновационные методы, самостоятельное мышление*

Annotation: *This article examines the issue of a creative approach by academic staff in organizing practical classes within the framework of higher education teaching organization (OTT). It highlights that the effectiveness of practical sessions largely depends*

on the teacher's ability to engage students and stimulate their active participation. The study emphasizes that, compared to traditional methods, a creative approach plays a key role in developing students' independent thinking, problemsolving skills, and practical knowledge. The paper also offers practical recommendations based on real educational experience to improve the organization of practical classes.

Keywords: *OTT, practical classes, creative approach, educational process, student engagement, innovative methods, independent thinking*

Hozirgi davrda oliy ta'lim tizimi oldida turgan eng muhim vazifalardan biri — nazariy bilim bilan bir qatorda talabalarning amaliy ko‘nikmalarini shakllantirishdan iborat. Aynan shu jarayonda amaliy mashg‘ulotlar alohida o‘rin egallaydi. Chunki talaba o‘rganayotgan bilimini aynan amaliy darslarda sinab ko‘radi, mustahkamlaydi va real vaziyatlarga qo‘llashni o‘rganadi. Biroq amaliy mashg‘ulotlarning samaradorligi har doim ham kutilgan darajada bo‘lavermaydi. Ko‘pincha darslar bir xil shaklda, faqat topshiriq bajarish bilan cheklanib qoladi va bu talabalarning qiziqishini pasaytiradi. Shu nuqtayi nazardan qaraganda, OTT sharoitida amaliy mashg‘ulotlarni tashkil etishda professor-o‘qituvchilarning kreativ yondashuvi alohida ahamiyat kasb etadi. Kreativ yondashuv deganda faqatgina yangi metodlardan foydalanish emas, balki darsni talaba uchun qiziqarli, tushunarli va hayot bilan bog‘liq tarzda tashkil etish tushuniladi. Masalan, oddiygina topshiriqni real muammo bilan bog‘lash yoki guruhlar bilan ishlash orqali talabalarning fikrlashini faollashtirish mumkin.

Talaba nigohidan qaraganda, aynan kreativ tashkil etilgan amaliy mashg‘ulotlar eng esda qoladigan va foydali bo‘ladi. Bunday darslarda talaba faqat tinglovchi emas, balki faol ishtirokchi sifatida qatnashadi, o‘z fikrini erkin bildiradi va muammolar ustida ishlashga o‘rganadi. Natijada uning mustaqil fikrlashi, muloqot ko‘nikmalari va amaliy bilimlari rivojlanadi.

Mazkur maqolaning maqsadi — OTT sharoitida amaliy mashg‘ulotlarni tashkil etishda professor-o‘qituvchilarning kreativ yondashuvini tahlil qilish, uning ahamiyatini ochib berish hamda amaliy darslarni yanada samarali tashkil

etish bo‘yicha takliflar ishlab chiqishdan iborat. OTT sharoitida amaliy mashg‘ulotlarni samarali tashkil etish masalasi bugungi ta’lim tizimining muhim yo‘nalishlaridan biri hisoblanadi. Amaliy darslarning asosiy vazifasi — talabaning nazariy bilimini mustahkamlash, uni real vaziyatlarda qo‘llashga o‘rgatishdan iborat. Biroq bu jarayon samarali kechishi ko‘p jihatdan professoro‘qituvchining yondashuviga bog‘liq. Agar mashg‘ulotlar an’anaviy, bir xil shaklda tashkil etilsa, talabalarda qiziqish pasayadi va natijadorlik kutilgan darajada bo‘lmaydi.[13]

Kreativ yondashuv esa amaliy mashg‘ulotlarga yangi ruh olib kiradi. Bunda o‘qituvchi darsni oddiy topshiriqlar bilan cheklab qo‘ymasdan, uni hayotiy vaziyatlar, muammoli holatlar va interaktiv metodlar asosida tashkil etadi. Masalan, guruhli ishlash, “case study”, rol o‘ynash yoki muammoli vazifalar orqali talabalar faol jalb qilinadi. Natijada ular faqat bilimni qabul qiluvchi emas, balki uni mustaqil tahlil qiluvchi va qo‘llovchi subyektga aylanadi.[14] Shuningdek, kreativ yondashuv talabalarning mustaqil fikrlashini rivojlantirishda muhim omil hisoblanadi. Amaliy mashg‘ulot davomida berilgan noodatiy topshiriqlar, ochiq savollar yoki muammoli vaziyatlar talabaning fikrlash doirasini kengaytiradi. Bunday jarayonda talaba tayyor javobni emas, balki o‘z yechimini izlaydi. Bu esa uning mantiqiy fikrlash, tahlil qilish va qaror qabul qilish ko‘nikmalarini shakllantiradi.[15] Bundan tashqari, amaliy mashg‘ulotlarda kreativ yondashuvni qo‘llash talabalarning faolligini oshiradi. Oddiy darslarda ko‘pincha faqat faol talabalar qatnashsa, kreativ tashkil etilgan mashg‘ulotlarda deyarli barcha talabalar jarayonga jalb etiladi. Chunki bunday darslar qiziqarli, interaktiv va erkin muhitda o‘tadi. Bu esa talabalarning o‘z fikrini bildirishdan qo‘rqmasligiga, jamoada ishlashiga va o‘ziga bo‘lgan ishonchini oshirishga yordam beradi.[16]

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[16] Prince, M. Does Active Learning Work? – Journal of Engineering Education, 2004.

Yana bir muhim jihat shundaki, kreativ yondashuv o‘qituvchining o‘z ustida ishlashini ham talab qiladi. Ya’ni, har bir mashg‘ulotni yangicha tashkil etish, yangi metodlarni sinab ko‘rish va talabalarning ehtiyojidan kelib chiqib darsni rejalashtirish zarur bo‘ladi. Bu esa ta’lim jarayonining doimiy rivojlanishiga xizmat qiladi va uning sifatini oshiradi.[17] Shunday qilib, OTT doirasida amaliy mashg‘ulotlarni kreativ yondashuv asosida tashkil etish talabalarning bilimini chuqurlashtirish, ularning mustaqil va innovatsion fikrlashini rivojlantirish hamda ta’lim samaradorligini oshirishning muhim omillaridan biri hisoblanadi.

Yuqoridagi tahlillar shuni ko‘rsatadiki, OTT sharoitida amaliy mashg‘ulotlarni samarali tashkil etishda professor-o‘qituvchilarning kreativ yondashuvi hal qiluvchi ahamiyatga ega. Amaliy darslar nafaqat nazariy bilimlarni mustahkamlash, balki ularni real vaziyatlarda qo‘llash, mustaqil fikrlash va muammo yechish ko‘nikmalarini shakllantirishga xizmat qiladi. Shu sababli bunday mashg‘ulotlarni oddiy, an’anaviy shaklda emas, balki zamonaviy va kreativ yondashuv asosida tashkil etish zarur. Kreativ yondashuv orqali tashkil etilgan amaliy mashg‘ulotlar talabalarning darsga bo‘lgan qiziqishini oshiradi, ularni faol ishtirok etishga undaydi va o‘z fikrini erkin bayon qilishiga imkon yaratadi. Bunday muhitda talaba o‘zini erkin his qiladi, yangi g‘oyalar ilgari suradi va jamoa bilan ishlash ko‘nikmalarini rivojlantiradi. Natijada ta’lim jarayoni samaradorligi oshadi va o‘quv jarayoni yanada mazmunli kechadi. Kreativ yondashuv o‘qituvchidan doimiy izlanishni, yangi metodlarni qo‘llashni va darsni talabalar ehtiyojiga moslashtirishni talab etadi. Bu esa o‘z navbatida ta’lim sifatining oshishiga va zamonaviy talablarga javob beradigan mutaxassislarni tayyorlashga xizmat qiladi.

Xulosa OTT doirasida amaliy mashg‘ulotlarni kreativ yondashuv asosida tashkil etish nafaqat ta’lim jarayonini faollashtiradi, balki talabalarning har tomonlama rivojlanishiga ham ijobiy ta’sir ko‘rsatadi. Shu bois, ta’lim tizimida

[17] Hmelo-Silver, C. Problem-Based Learning. – Educational Psychology Review, 2004.

bunday yondashuvlarni keng joriy etish va amaliyotga tatbiq etish muhim ahamiyat kasb etadi.

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BO‘LAJAK TARBIYACHILARNI KREATIV QOBILIYATINI RIVOJLANTIRISH

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Annotatsiya: *Ushbu maqolada bugungi zamonaviy jamiyatda o‘z o‘rniga ega bo‘la oladigan, kreativ qobiliyatli bo‘lajak tarbiyachilarni shakllantirishda duch kelayotgan muammolar va ularni bartaraf etish borasidagi fikr-mulohazalar bayoni keltirilgan.*

Kalit so‘zlar: *Kreativlik, qobiliyat, globallashuv, ijodkorlik, zamonaviy, yondashuv, ta’lim, tarbiyachi, yaratuvchanlik, kritik talqin, kompetentlik, indikator, sifat, interfaol, takomillashuv.*

Abstract: *This article presents a description of the problems encountered in the formation of creatively capable future educators who can take their place in today's modern society, and ideas for overcoming them.*

Keywords: *Creativity, ability, globalization, creativity, modern, approach, education, educator, creativity, critical interpretation, competence, indicator, quality, interactive, improvement.*

KIRISH

Jahonda fan va texnika rivoji jadal globallashgan bir davrda zamonaviy jamiyatda ro‘y berayotgan muammolarni bartaraf etish uchun intellektual salohiyatli, kreativ fikrlovchi va ijodkor pedagoglarga talab oshib bormoqda. Xususan, BMTning “2030-yilgacha Barqaror rivojlanish maqsadlari” strategiyasi hamda UNICEFning maktabgacha ta’limni rivojlantirish strategiyasida bolalarni erta yoshdan boshlab sifatli maktabgacha ta’lim bilan qamrab olish, shuningdek, maktabgacha ta’lim tizimini zamonaviy yondashuvlar asosida takomillashtirish darajasi asosiy indikatorlardan biri sifatida belgilangan. Bu hujjatlarda ta’lim standartlari pedagoglardan nafaqat yuqori malaka va muntazam kasbiy rivojlanishni, balki pedagogik jarayonda

ijodkorlik, ta’limiy vaziyatlarga kreativ yondashuv va interfaol metodlarni amaliyotda qo‘llashni ham talab etadi.

Zamonaviy ta’lim islohatlari davrida kreativ fikrlovchi tarbiyachilarga talab ortayotganli, o‘quv jarayonida bilim oluvchilarning yangilikka intilish qobiliyatini shakllantirish muhim vazifadir. Bugungi ta’lim-tarbiya tizimida ko‘plab yondashuv va metodlar ijodiy fikrlash, kritik talqin va tahlilga asoslangan bo‘lib, berilgan ma’lumotni to‘g‘ri tushunib, to‘g‘ri yetkazib bera olishga, zamonaviy axborotlarni umumiylashtirib, xulosa chiqara olishga qaratilgandir.

ASOSIY QISM

Kreativlik so‘zi aslida “yaratish” ma’nosini bildiradi, jamiyatdagi shaxsning yangilik yaratishi, muammolarni hal qilishga yo‘nalgan kreativ qobiliyati hisoblanadi. Kreativlikning tub mazmun-mohiyati noodatiylik, kreativ fikrlash, mustaqillik va yangilikka intilish hamda muammoli vaziyat yuzasidan keng tasavvur va dunyoqarash asnosida bir xulosaga kelishda turli yondashishni bildiradi [3;52-b].

Aslida kretivlik yuqumli xususiyatga ega bo‘lib, kreativ bo‘lish uchun ko‘proq kreativ insonlar bilan do‘stlashish, suhbatlashish va doimo izlanishda bo‘lish kerak. Shaxsda turli ko‘nikmani shakllantirish mumkun bo‘lganidek, kreativ fikrlash qobilyatini ham shakllantirish mumkin. Kreativlik bo‘lajak tarbiyachilarga ham taalluqli tushuncha bo‘lib, o‘z ustida ishlash bo‘lajak mutaxassislarga noodatiy tarzda fikrlashga, tasavvurga ega bo‘lishga ko‘maklashadi. Ammo, bo‘lajak tarbiyachilarni ruhlantirish, ularni qo‘llab-quvvatlash va kreativ bo‘lishga undash masalasi pedagogning yuqori darajada malakali bo‘lishini talab etadi. Jumladan, auditoriyadagi ilmiy muhit, bo‘lajak tarbiyachilarda fikrlash tarzining shakllanishi, “tarbiyachining yondashuvi va strategiyasini ko‘rsatadi” [6;170-171b].

Bugungi ta’lim jarayonida maktabgacha ta’limda mashg‘ulotlarini oldindan rejalashtirilishidan voz kechish, bo‘lajak tarbiyachilarda “tahliliy-

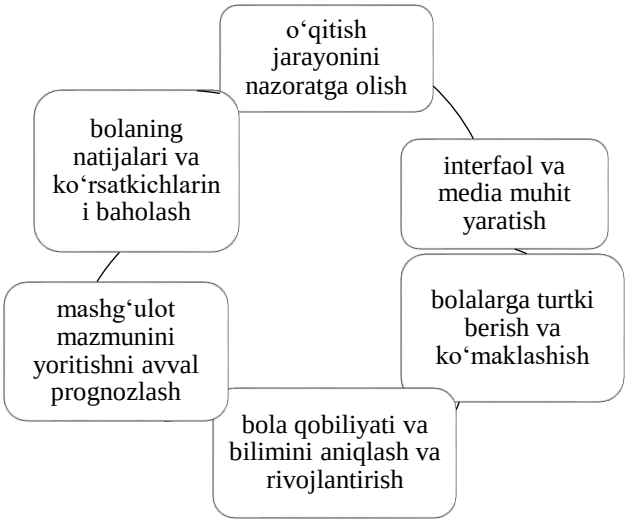
tanqidiy, kreativ tafakkurni shakllantirish va rivojlantirish, ularda ijodkorlik, kreativ dunyoqarash, yangi innovatsion ilmlarni o‘ylab topishga undash bilim olishga” bo‘lgan munosabatni o‘zgartirish, tubdan yangilash ularni yutuqlarga erishishga motivatsiya berish asosiy omil hisoblanadi. “Tarbiyachi-pedagogning kreativ va ijodkor bo‘lishi yoki bo‘lmasligida emas, balki mashg‘ulotlarni zamonaviy texnologiyalar asosida olib borish, yangi innovatsion g‘oyalarni ta’lim-tarbiya jarayonida sinab ko‘rishga intilishi muhimdir”.

Bo‘lajak tarbiyachilarning kreativligini rivojlantirish hamda kompetentligini oshirish dolzarb vazifalardan biri sifatida qayd etilmoqda. Dunyoning zamonaviy innovatsiyalariga moslashish, doimiy yangilanuvchi jamiyat hayotiga tarbiyachilarni tayyorlash va ularni zamon talablariga hamnafas va katta ishtiyoq bilan o‘z hissasini qo‘shish kabi ijodiy faoliyatni rivojlantirish tizimini takomillashtirish barcha oliy ta’lim muassasasi pedagoglarini muhim ta’limiy vazifalaridan biri hisoblanadi [4;555-b].

O‘zbekiston Respublikasi Prezidentining 2024-yil 30-sentyabrdagi “Maktabgacha ta’lim sifati va samaradorligini yanada oshirish bo‘yicha qo‘shimcha chora-tadbirlari to‘g‘risida”gi PF-152-son Farmoni ijrosini ta’minlash, ta’lim tizimi sifatini hamda samaradorligini oshirish yo‘lida bir qator chora-tadbirlar amalga oshirilmoqda [1]. Xususan, pedagoglarni qo‘llab-quvvatlash va rag‘batlantirish, ilg‘or pedagogik hamda axborot texnologiyalarini joriy etish, zamonaviy maktabgacha ta’lim tashkilotlari tarmog‘ini kengaytirish, innovatsion yondashuvlarni tatbiq etish, moddiy-texnika bazasini mustahkamlash va malakali mutaxassislarni o‘quv jarayoniga jalb qilish kabi yo‘nalishlar ustuvor ahamiyat kasb etmoqda. Shuningdek, turli yosh guruhidagi tarbiyalanuvchilarda aqliy va kognitiv intellektual salohiyatni oshirish, jismoniy barkamollikni mustahkamlash va sog‘lom dunyoqarashni shakllantirishga qaratilgan integrativ ta’lim dasturlarini joriy etish bo‘yicha keng ko‘lamli ishlar amalga oshirilmoqda. Jumladan, mamlakatimizda mutaxassislar tayyorlashning

sifat darajasini, xalqaro standartlar negizida oliy malakali mutaxassislar tayyorlash jarayonida zarur shart-sharoitlarni yaratish ahamiyat kasb etadi.

Shuningdek, bo‘lajak kreativ tarbiyachiga didaktik kompetensiya talablari ham qo‘yiladi va bu bo‘yicha quyidagilarni taklif qilamiz (1-rasm):



1-rasm. Kreativ tarbiyachining didaktik kompetensiyasi

Yuqoridagi talablar bo‘lajak tarbiyachilardan milliy va ma’naviy qarashlarga ega bo‘lish, intellektual, informatsion, motivatsion, metokognitiv, ya’ni bilish faolligi, refleksiv hamda o‘zini-o‘zi baholash malakalarini rivojlantirish zaruratini belgilaydi. Agar tarbiyachi o‘z kasbining sir-asrorlarini to‘liq egallab, ta’lim jarayonini sifatli tashkil eta olmasa va o‘z ustida mashaqqat chekib ishlamasa, u zamon talabiga mos pedagog sifatida e’tirof etilmaydi [5;5-8-b].

O‘tkazilgan tajriba-sinov davrida maktabgacha ta’lim tashkiloti tarbiyachilari faoliyatini o‘rganish bu yo‘nalishda muayyan kamchiliklar mavjudligini ko‘rsatdi:

- maktabgacha ta’lim-tarbiya tizimini sifatli yo‘lga qo‘yish, tarbiyachilarning yetarli darajada tashkiliy, pedagogik-metodik kompetensiyalarga ega emasliklari;
- malaka oshirish kurslari o‘quv rejalarini shakllantirishda tinglovchilarning ehtiyojlari inobatga olinmasligi natijasida tarbiyachilarda malaka oshirishga nisbatan motivatsiyaning pastligi

– ta’limiy mashg‘ulotlarining samaradorligini oshirishga qaratilgan texnologiyalar hamda imkoniyatlardan to‘la foydalanmaslik;
– tarbiyachilarning innovatsion faoliyatga tayyor emasligi, o‘z faoliyatida shaxsga yo‘naltirilgan ta’lim va axborot texnologiyalarini samarali qo‘llay olmasligi;
– tarbiyachilarda muloqotchanlik, diagnostik, refleksiv, tashkilotchilik ko‘nikmalarining yetarli darajada shakllanmaganligi;
– didaktik o‘yinlar vositasida tarbiyachilarning kreativ qobiliyatini rivojlantirish modeli hozirgi zamon talablari asosida takomillashtirilishi;
– oliy ma’lumotli tarbiyachilarning yetarli emasligi ba’zi holatlarda mavjudlini ko‘rishimiz mumkin.

Mahorat, verbal intellekt, ijodkorlik, kasbiy yetuklik, tarbiyachi-pedagog shaxsining rivojlanish mexanizmi hisoblansa, pedagogik professionallikni kreativlik sifatida baholash mumkindir. Pedagogik tajriba va mahorat tarbiyachini kreativ shakllantirishga tayyorlash jarayonining pedagogik omili hisoblanadi [2; 825-b].

Tadqiqotimizni olib borishimiz davomida, yuqorida keltirilgan muammolarni tahlili va yechimi sifatida quyidagi bir qator vazifalarni amalga oshirish muhimligi aniqlanildi.

– malaka oshirish kurslari davomida zamonaviy va axborot texnologiyalarini qo‘llash samaradorligini yanada rivojlantirish;
– tarbiyachilarning uzluksiz kasbiy rivojlanishining tashkiliy-didaktik tizimini xorij tajribasi asosida mukamallashtirish;
– kreativ tarbiyachi shaxsini shakllantirishda xorijiy yetuk mutaxassislar bilan hamkorlikda tajriba almashish tizimini takomillashtirish;
– integrativ yondashuv asosida o‘quv seminarlarini tashkil etish;
– tarbiyachilarning kreativ qobiliyatini rivojlantirishda ijtimoiy-madaniy, pedagogik-psixologik, me’yoriy-huquqiy ko‘nikmalarni shakllantirish;
– tarbiyachilarning malakasini oshirish kurslari mazmunini ijtimoiy, metodik

va pedagogik talablar asosida takomillashtirish va boshqalardan iborat.

Darhaqiqat, bo‘lajak tarbiyachilarni bolalar bilan ishlashda ulardagi o‘ziga xos jihatlarni shakllantirish, kreativ sifatlarni rivojlantirish, ta’limiy faoliyatlarni tashkil etish jarayonida interfaol usullardan foydalangan holda noa’nanaviy ko‘rinishlarda tashkil etish mihim jihatlardan sanaladi. Yuqoridagi talablar tarbiyachilardan milliy va ma’naviy qarashlarga ega bo‘lish, intellektual, informatsion, motivatsion, kognitiv, ya’ni bilish faolligi, refleksiv hamda o‘zini-o‘zi baholash malakalarini rivojlantirish zaruratini belgilaydi. Agar tarbiyachi o‘z kasbining sir-asrorlarini to‘liq egallab, ta’lim jarayonini sifatli tashkil eta olmasa va o‘z ustida mashaqqat chekib ishlamasa, u zamon talabiga mos pedagog sifatida e’tirof etilmaydi.

XULOSA

Xulosa qilib aytganda, ijodiy faoliyatni rivojlantirish - bu subyektiv va obyektiv omillar ta’siri ostida bo‘lgan murakkab va shaxsiy jarayon. Maktabgacha ta’lim tashkilotlarida barcha bolalar pedagoglar tomonidan shaxsiy yo‘l-yo‘riq, yordam va to‘g‘ri yo‘l-yo‘riqlarga muhtoj. Tarbiyachining bu faoliyati bolalarning ijodiy va ijtimoiy faol shaxs bo‘lishida katta ahamiyatga ega ekanligini ko‘rsatdi. Bo‘lajak tarbiyachilarda uchraydigan muammolarni bartaraf etishda, ularni tanlagan kasbiga bo‘lgan muhabbatni uyg‘otish, o‘z ustida tinimsiz mehnat qilishga, bolalarni sevishga, hayotda o‘z o‘rnini topish uchun zukko, bilimli, kurashuvchan bo‘lishga motivatsiya uyg‘otish juda muhimdir. Zero, inson muvaffaqiyatga bir kunda emas, balki har kun bir qadam tashlagandagina erishadi.

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ENHANCING THE METHODOLOGY OF USING ELECTRONIC LEARNING RESOURCES IN TEACHING STUDENTS AT TECHNICAL HIGHER EDUCATION INSTITUTIONS

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Abstract: *This study investigates the improvement of methodologies for utilizing electronic learning resources (ELRs) in the education of students at technical higher education institutions. Focusing on technical universities, the research analyzes current practices, identifies challenges, and proposes enhanced approaches for optimizing ELR integration to boost students' academic performance and engagement in technical mechanics-related courses.*

Keywords: *electronic learning resources, artificial intelligence, education, digital transformation, adaptive learning, individualization, pedagogical technologies, data security, role of the teacher.*

INTRODUCTION

The digitization of education has led to a noticeable shift in pedagogical practices worldwide (Garrison & Vaughan, 2008). Electronic Learning Resources (ELRs), encompassing a wide range of digital materials such as interactive simulations, video lectures, and e-textbooks, have the potential to transform the educational experiences of students, especially within technical higher education institutions (Al-Fadhli & Al-Waili, 2020). However, the mere availability of ELRs does not guarantee their effective application, as pedagogical approaches and methodological frameworks significantly influence learning outcomes (Laurillard, 2012).

In the field of technical mechanics, where conceptual understanding and practical application are critical, integrating ELRs with a well-designed methodology is crucial. This dissertation addresses the gap in methodology by

investigating current practices in technical universities and proposing enhancements grounded in pedagogical theory and practical requirements.

Literature Review. Electronic Learning Resources in Higher Education

The proliferation of ELRs has led educational institutions to rethink traditional instruction (Anderson, 2008). ELRs offer flexibility, interactivity, and access to up-to-date content, which are vital in technical education environments (Johnson et al., 2016). Despite these advantages, studies reveal challenges such as digital divide issues, lack of digital literacy among educators, and inadequate methodological support for ELR integration (Selwyn, 2016).

Pedagogical Theories Supporting ELR Use. Constructivist learning theories emphasize active engagement, where learners construct knowledge through interaction with educational materials (Piaget, 1973). Laurillard's conversational framework (2012) highlights dialogue between learners and tutors, facilitated by ELRs, as key to effective learning. Applying these theories to technical mechanics requires specific methodological adaptations to balance theory and practice digitally.

Challenges and Solutions in Technical Education. Research in technical education stresses that the abstract nature of subjects like mechanics necessitates visual and interactive ELRs to enhance comprehension (Mayer, 2009). Moreover, empirical studies indicate that educator readiness and institutional infrastructure critically affect ELR effectiveness (Kirkwood & Price, 2014).

Research Objectives. To assess existing methodologies of ELR usage in technical mechanics courses at technical universities.

- To identify barriers to effective ELR integration from student and educator perspectives.

- To develop and implement an improved methodological framework for ELR utilization.

- To evaluate the impact of the enhanced methodology on student engagement and academic performance.

METHODOLOGY

The mixed-methods approach was adopted, involving:

- Quantitative surveys administered to 150 students and 30 faculty members across three technical universities.

- Qualitative semi-structured interviews with 15 educators to gain insights on ELR integration challenges.

- Observational analysis of classroom practices and ELR usage.

- The design and pilot implementation of a methodological intervention model emphasizing interactive, scaffolded ELR incorporation aligned with curriculum goals.

- Pre- and post-test assessments evaluating student learning outcomes.

Data was analyzed via SPSS for statistical significance ($p < 0.05$), and thematic analysis was applied to qualitative data.

RESULTS

The study findings included:

- A significant positive correlation ($r = 0.65$, $p < 0.01$) between structured ELR use and student exam performance.

- Enhanced student motivation and self-regulated learning capabilities post-intervention, as reported in surveys.

- Identification of key obstacles: insufficient training for educators (73%), limited access to reliable technology (48%), and lack of interactive content (61%).

- Educators rated the new methodological model highly for clarity and applicability (mean rating 4.5/5).

DISCUSSION

This research confirms the theoretical and practical imperative of refined ELR methodologies. Aligning with Garrison and Vaughan’s blended learning

model (2008), the intervention bridged face-to-face and digital modalities effectively. The findings corroborate Kirkwood & Price (2014) on educator readiness as a pivotal factor and support Mayer's (2009) emphasis on multimedia learning principles.

The study indicates that technical mechanics education benefits from ELRs that not only deliver content but actively engage students through interactivity and scaffolded support, enhancing conceptual grasp and practical skills. Investment in educator training and infrastructural improvements was identified as critical for sustainable integration.

CONCLUSION

The proposed methodological improvements significantly enhance ELR utilization efficacy in technical higher education, particularly within technical mechanics courses. By addressing pedagogical design, educator competence, and technological accessibility, the study contributes a validated framework for digital pedagogy advancement in technical domains.

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BO‘LAJAK BOSHLANG‘ICH SINF O‘QITUVCHILARINI KASBIY MOTIVATSIYASINI SHAKLLANTIRISHNING IJTIMOIY-PEDAGOGIK ZARURIYATI

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Annotatsiya: *Ushbu maqolada Bo‘lajak boshlang‘ich sinf o‘qituvchilarini kasbiy motivatsiyasini shakllantirishning ijtimoiy-pedagogik zaruriyati, jamiyatda boshlang‘ich ta’limning sifatini oshirish, pedagogik professionallikni takomillashtirish shart-sharoitlari tadqiq qilingan. Bo‘lajak o‘qituvchilarda kasbiy motivatsiyaning shakllanishidagi kasbiy kompetensiyalari rivojlanishi va metodik tayyorgarligi nazariy va umumiy jihatlari ilmiy asoslangan.*

Kalit so‘zlar: *kasbiy motivatsiya, kasbiy kompetensiya, pedagogik professionallik, metodik, komponent, innovatsion faoliyat.*

Annotation:*In this article, the socio-pedagogical necessity of forming the professional motivation of future primary school teachers, the conditions for improving the quality of primary education in society, and improving pedagogical professionalism have been researched. The theoretical and general aspects of the development of professional competences and methodical training in the formation of professional motivation of future teachers are scientifically based.*

Key words: *professional motivation, professional competence, pedagogical professionalism, methodical, component, innovative activity.*

Аннотация: *В данной статье исследованы социально-педагогическая необходимость формирования профессиональной мотивации будущих учителей начальных классов, условия повышения качества начального образования в обществе, повышения педагогического профессионализма. Научно обоснованы теоретические и общие аспекты развития профессиональных компетенций и методической подготовки в формировании профессиональной мотивации будущих учителей.*

Ключевые слова: *профессиональная мотивация, профессиональная компетентность, педагогический профессионализм, методический, компонент, инновационная деятельность.*

KIRISH

Jamiyat rivojlanishining asosiy manbai hisoblangan intellektual kapitalga qo‘yilgan sarmoyalar uzoq muddatli va barqaror iqtisodiy-ijtimoiy samara beradi. Bunday sharoitda ta’limning sifati shaxsning moddiy va ma’naviy ehtiyojlari, madaniyatning umumiy darajasi, sanoatda, ishlab chiqarishda yangi usul va yo‘nalishlarni topa oladigan nostandart, kreativ tafakkur, yangi sohalarning vujudga kelishi bilan bog‘liq malaka va ko‘nikmalarni rivojlantirish, shuningdek, ta’limning sifat va samaradorligini ta’minlashning asosiy omili bo‘lgan bo‘lajak o‘qituvchilarning kasbiy motivatsiyasini shakllantirish darajasi bilan o‘lchanadi.

Ta’lim, kasbiy bilim va ko‘nikmalar, umumiy va maxsus qobiliyatlar, ijtimoiy ahamiyatga ega muhim fazilatlar bo‘lajak o‘qituvchilarning kasbiy motivatsiyasini shakllantirishning asosiy negizini tashkil etadi. Shaxsiy xususiyatlar insonning rivojlanish sur’ati va darajasiga ham inson sifatida, ham mutaxassis sifatida ta’sir qiladi. Bo‘lajak o‘qituvchining yetakchi shaxsiy xususiyatlariga uning munosabatlari, motivlari, aql-zakovati, hissiy-irodaviy doirasi kiradi. Ular bilvosita shaxsning rivojlanishiga ta’sir qiladi va asosan kasbiy rivojlanishni belgilaydi. Shaxsning kasbiy yutuqlari darajasi ham individual xususiyatlar, ham shaxsiy xususiyatlar bilan belgilanadi. Ilmiy manbalarning empirik tahlili bo‘lajak o‘qituvchilarning shaxsiy xususiyatlari quyidagilardan iborat ekanligini ko‘rsatdi: akmeologik mavqe, yutuqlar uchun barqaror motivatsiya, moslashuvchan va moslashtirilmagan faoliyat, muvaffaqiyatli kasbiy faoliyat tajribasi, yuqori ish qobiliyati, mas’uliyat, o‘z yutuqlarini boshqa xodimlar uchun odatiy holga aylantirish istagi, iroda va dam olish qobiliyati, kasbiy maqsadga erishish uchun barqaror istak va o‘zini o‘zi takomillashtirish.

Ko‘rinib turibdiki, bo‘lajak o‘qituvchilarning kasbiy motivatsiyasini shakllantirish unda nafaqat kasbiy bilimlarning kerakli darajasini, balki, psixologik tayyorgarlikni, o‘zini o‘zi va o‘quv-tarbiya jarayonini boshqarish, o‘zini kerakli faoliyatga yo‘naltirish, kasbiy, ma’naviy, jismoniy va shaxsiy imkoniyatlarini kerakli sharoitda qo‘yilgan masalani hal etishga to‘g‘ri yo‘naltira olish kabi kasbiy ko‘nikmalarni shakllantirishni nazarda tutadi.

Bo‘lajak boshlang‘ich sinf o‘qituvchilarini kasbiy motivatsiyasini shakllantirishning ijtimoiy-pedagogik zaruriyatini asoslash masalalariga turli nuqtai nazardan yondashish mumkin:

Birinchidan, bo‘lajak boshlang‘ich sinf o‘qituvchilari kasbiy motivatsiyasining ijtimoiy ahamiyati.

Jamiyatda boshlang‘ich ta'limning sifatini oshirish. Kasbiy motivatsiya – bu boshlang‘ich sinf o‘qituvchisining pedagogik faoliyatga, o‘quvchilarni tarbiyalash va ta’lim berish jarayoniga qiziqishini oshirish va unga bo‘lgan ishonchni mustahkamlashda asosiy omildir. Kasbiy motivatsiyaning shakllanishi jamiyatda boshlang‘ich ta’limning sifatini oshirish, o‘quvchilarning bilim va ko‘nikmalarini yanada rivojlantirishga xizmat qiladi. Shuningdek, bu pedagogning o‘z kasbiga bo‘lgan hurmatini oshirishga va uning professional o‘sishiga yordam beradi.

Ta’lim tizimi va ijtimoiy ehtiyojlar: kasbiy motivatsiya yuqori bo‘lgan boshlang‘ich sinf o‘qituvchisi o‘z ishiga ko‘proq mas'uliyat bilan yondashadi va ta'limda innovatsion yondashuvlarni qo‘llashga tayyor bo‘ladi. Bu esa jamiyatning ma'naviy va intellektual rivojlanishiga yordam beradi.

Pedagogik professionallikni oshirish: bugungi kunda boshlang‘ich ta'lim o‘qituvchilaridan faqat bilim berish emas, balki, o‘quvchilarni tarbiyalashda, ularning ijtimoiy va shaxsiy rivojlanishida ham faol ishtirok etish talab etiladi. Bu esa o‘qituvchining kasbiy motivatsiyasini yanada mustahkamlashni taqozo etadi.

Ta’lim tizimida islohotlar va yangi talablarga javob berish: yangi pedagogik yondashuvlar va metodologiyalarni qo‘llash, zamonaviy texnologiyalardan samarali foydalanish kabi yangi talablar boshlang‘ich sinf o‘qituvchisining kasbiy motivatsiyasiga bevosita ta'sir qiladi. Bu jarayon o‘qituvchini o‘zining professional darajasini doimiy ravishda oshirishga undaydi.

Sifatli ta’lim va jamiyat ehtiyojlari: kasbiy motivatsiyasi yuqori bo‘lgan o‘qituvchisi o‘z faoliyatini samarali tarzda amalga oshira, bu esa umumiy ta'lim sifatiga ijobiy ta'sir ko‘rsatadi. Xususan, boshlang‘ich ta'limda o‘quvchilarni yangi bilimlar va ko‘nikmalarga o‘rgatish uchun o‘qituvchilarni kasbiy jihatdan rag‘batlantirish zarur.

Ikkinchidan, bo‘lajak boshlang‘ich sinf o‘qituvchilarining kasbiy motivatsiyasini shakllantirish metodikasini takomillashtirishning ijtimoiy-pedagogik zaruriyati.

Metodikalarning samaradorligini oshirish: o‘qituvchilarni kasbiy motivatsiyasini shakllantirishning samarali metodikalari, ayniqsa, boshlang‘ich ta'lim tizimida o‘qituvchilarning ishlash faoliyatini yaxshilashda muhim ahamiyatga ega. Bu metodikalar talabalarni kasbiy muvaffaqiyatga undashda, ularning o‘z-o‘zini rivojlantirishga bo‘lgan istaklarini kuchaytirishga yordam beradi.

Innovatsion yondashuvlar: ta’lim tizimiga yangi metodlar, texnologiyalar va pedagogik yondashuvlarni joriy etish kasbiy motivatsiyani rivojlantirish uchun zarur bo‘lgan asosiy omillardan biridir. Bu jarayonning samarali bo‘lishi uchun o‘qituvchilarning kasbiy tayyorgarligi va motivatsiyasi yuqori bo‘lishi kerak.

O‘qituvchilarni psixologik va ijtimoiy qo‘llab-quvvatlash: bo‘lajak o‘qituvchilarning kasbiy motivatsiyasini shakllantirishda psixologik yondashuvlar va pedagogik maslahatlar orqali ularning ichki motivatsiyasini

oshirish zarur. Bu o‘qituvchilarning o‘z ishlariga bo‘lgan ishtiyoqini va mas'uliyatini oshiradi.

Uchinchidan, jamiyat va ta'lim tizimi hamda kasbiy motivatsiya o‘rtasidagi o‘zaro aloqalar.

O‘qituvchilar va jamiyat o‘rtasidagi aloqalar: jamiyatda boshlang‘ich ta’limning ahamiyati ortib borishi bilan o‘qituvchining kasbiy motivatsiyasi ham rivojlanadi. Jamiyatning ta'limga bo‘lgan ehtiyoji o‘qituvchilarni o‘z kasbiga bo‘lgan motivatsiyasini mustahkamlashda, shuningdek, o‘zgaruvchan ijtimoiy sharoitlarga moslashishda muhim rol o‘ynaydi.

Pedagogik islohotlar: kasbiy motivatsiyaning shakllanishi, ayniqsa, pedagogik islohotlar doirasida o‘qituvchilarga yangi maqsadlar va vazifalar yuklaydi, bu esa ularning motivatsiyasini kuchaytiradi.

To‘rtinchidan, kasbiy motivatsiya shakllanishining ta’lim tizimining barqarorligiga ta'siri.

Ta’lim tizimining barqarorligi: kasbiy motivatsiyasi yuqori bo‘lgan boshlang‘ich sinf o‘qituvchisi ta'lim tizimini barqaror rivojlanishiga hissa qo‘shadi, bu esa o‘z navbatida jamiyatning ilg‘or rivojlanishiga olib keladi.

Sifatli ta’lim va kelajak avlod: o‘qituvchilarning kasbiy motivatsiyasini oshirish orqali sifatli ta'lim berish imkoni oshadi, bu esa jamiyatning intellektual va ma'naviy salohiyatini oshiradi.

Yuqoridagilarni umumlashtirib, xulosa qilish mumkinki, bo‘lajak boshlang‘ich sinf o‘qituvchisining kasbiy motivatsiyasini shakllantirish metodikasini takomillashtirish — ijtimoiy-pedagogik zaruriyat, chunki bu jarayon nafaqat ta'lim tizimining samaradorligini, balki jamiyatning ta'limga bo‘lgan ehtiyojlarini, o‘quvchilarning sifatli bilim olish imkoniyatlarini ta'minlashga yordam beradi.

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OLIY TA'LIMDA BO'LAJAK PEDAGOGLARDA GENDER MADANIYATI KOMPETENSIYASINI RIVOJLANTIRISH

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Annotatsiya: *Mazkur maqolada oliy ta'lim muassasalarida tahsil olayotgan bo'lajak pedagoglarda gender madaniyati kompetensiyasini rivojlantirishning nazariy asoslari hamda uning ta'lim sifatini oshirishdagi ahamiyati yoritilgan. Tadqiqotda gender madaniyati tushunchasining pedagogik mazmuni tahlil qilinib, uni shakllantirishga ta'sir etuvchi omillar va samarali pedagogik yondashuvlar ko'rib chiqilgan. Shuningdek, oliy ta'lim jarayonida gender tengligi tamoyillarini qaror toptirish, talabalarda teng huquq va o'zaro hurmatga asoslangan munosabatlarni rivojlantirishning ahamiyati asoslab berilgan. Tadqiqot nazariy tahlil, ilmiy adabiyotlarni o'rganish hamda normativ-huquqiy hujjatlarni tahlil qilish metodlari asosida amalga oshirilgan. Natijalar gender madaniyati kompetensiyasini rivojlantirish bo'lajak pedagoglarning kasbiy kompetensiyasini mustahkamlash, ta'lim jarayonida xolis va inklyuziv muhitni shakllantirish hamda barqaror rivojlanish maqsadlariga erishishga xizmat qilishini ko'rsatadi.*

Kalit so'z: *gender madaniyati, gender kompetensiyasi, bo'lajak pedagog, oliy ta'lim, gender tengligi, ta'lim sifati, inklyuziv ta'lim, barqaror rivojlanish, pedagogik yondashuv, kasbiy kompetensiya.*

Abstract: *This article discusses the theoretical foundations of developing gender culture competence in future teachers studying in higher education institutions and its importance in improving the quality of education. The study analyzes the pedagogical content of the concept of gender culture, considers the factors influencing its formation, and effective pedagogical approaches. The importance of establishing principles of gender equality in higher education and developing relationships based on equal rights and mutual respect among students is also justified. The study was conducted using theoretical analysis, a study of scientific literature, and the analysis of regulatory and legal documents. The results show*

that the development of gender culture competence strengthens the professional competence of future teachers, creates an impartial and inclusive environment in the educational process, and serves to achieve the Sustainable Development Goals. ***Keywords:*** *gender culture, gender competence, future teacher, higher education, gender equality, quality of education, inclusive education, sustainable development, pedagogical approach, professional competence.*

Аннотация: *В статье рассматриваются теоретические основы развития гендерной культурной компетентности у будущих педагогов, обучающихся в высших учебных заведениях, и ее значение в повышении качества образования. В исследовании проанализировано педагогическое содержание понятия гендерной культуры, рассмотрены факторы, влияющие на ее формирование, и эффективные педагогические подходы. Также обосновывается важность утверждения принципов гендерного равенства в высшем образовании и развития у студентов отношений, основанных на равенстве и взаимном уважении. Исследование проводилось на основе методов теоретического анализа, изучения научной литературы и анализа нормативных правовых документов. Результаты показывают, что развитие гендерной культурной компетентности способствует укреплению профессиональной компетентности будущих педагогов, формированию объективной и инклюзивной среды в образовательном процессе и достижению целей устойчивого развития.*

Ключевые слова: *гендерная культура, гендерная компетентность, будущий педагог, высшее образование, гендерное равенство, качество образования, инклюзивное образование, устойчивое развитие, педагогический подход, профессиональная компетентность.*

KIRISH

Bugungi kunda dunyoda yuz berayotgan globallashuv, raqamlashtirish va ijtimoiy munosabatlarning o‘zgarishi ta’lim tizimi oldiga yangi vazifalarni qo‘ymoqda. Zamonaviy ta’lim nafaqat malakali mutaxassislarni tayyorlash, balki yuksak ma’naviy-axloqiy fazilatlarga, demokratik qadriyatlarga va ijtimoiy mas'uliyatga ega shaxslarni tarbiyalashni ham nazarda tutadi. Shu nuqtai nazardan, bo‘lajak pedagoglarda gender madaniyati kompetensiyasini rivojlantirish oliy ta’lim tizimining muhim yo‘nalishlaridan biri hisoblanadi.

Gender madaniyati shaxsning gender tengligi, o‘zaro hurmat, adolat va inson huquqlariga oid bilim, qadriyat va xulq-atvorini ifodalaydi. Pedagogning

gender madaniyatiga ega bo‘lishi ta’lim jarayonida barcha talabalarga teng munosabatda bo‘lish, stereotiplardan xoli yondashuvni qo‘llash hamda inklyuziv ta’lim muhitini yaratishda muhim ahamiyat kasb etadi. Ayniqsa, bo‘lajak pedagoglar oliy ta’lim davridayoq ushbu kompetensiyani egallashlari ularning kelgusidagi kasbiy faoliyati samaradorligini oshirishga xizmat qiladi.

O‘zbekiston Respublikasida ham gender tengligini ta’minlash va ta’lim sifatini oshirishga qaratilgan keng ko‘lamli islohotlar amalga oshirilmoqda. Xususan, «Xotin-qizlar va erkaklar uchun teng huquq hamda imkoniyatlar kafolatlari to‘g‘risida»gi Qonun hamda «Ta’lim to‘g‘risida»gi Qonun oliy ta’lim tizimida teng imkoniyatlarni yaratish va bo‘lajak pedagoglarning kasbiy kompetensiyalarini rivojlantirish uchun muhim huquqiy asos bo‘lib xizmat qilmoqda.

Shu bilan birga, oliy ta’lim muassasalarida gender madaniyatini rivojlantirish bo‘yicha olib borilayotgan ishlarni ilmiy jihatdan tahlil qilish, samarali pedagogik yondashuvlarni aniqlash hamda ularni ta’lim jarayoniga tatbiq etish zarurati mavjud. Bu esa mazkur tadqiqotning dolzarbligini belgilaydi.

Tadqiqot metodologiyasi

Mazkur tadqiqot sifatli tadqiqot yondashuvi asosida amalga oshirildi. Tadqiqot jarayonida bo‘lajak pedagoglarda gender madaniyati kompetensiyasini rivojlantirishga oid ilmiy-nazariy manbalar, xalqaro tashkilotlarning tavsiyalari hamda O‘zbekiston Respublikasining ta’lim va gender tengligiga oid normativ-huquqiy hujjatlari tahlil qilindi.

Tadqiqotning metodologik asosini pedagogik, psixologik va sotsiologik yondashuvlar tashkil etdi. Gender madaniyatining mazmun-mohiyati, uning bo‘lajak pedagoglarning kasbiy kompetensiyalarini rivojlantirishdagi o‘rni hamda ta’lim sifati bilan o‘zaro bog‘liqligini aniqlash maqsadida ilmiy adabiyotlarni tahlil qilish, qiyosiy tahlil, tavsifiy tahlil va umumlashtirish metodlaridan foydalanildi.

Ilmiy adabiyotlarni tahlil qilish jarayonida gender madaniyati, gender tengligi, inklyuziv ta’lim va pedagogik kompetensiyaga oid mahalliy hamda xorijiy tadqiqotlar o‘rganildi. Xususan, UNESCO va Birlashgan Millatlar Tashkiloti tomonidan qabul qilingan hujjatlar, Barqaror rivojlanish, shuningdek, O‘zbekiston Respublikasining “Ta’lim to‘g‘risida»gi hamda «Xotin-qizlar va erkaklar uchun teng huquq hamda imkoniyatlar kafolatlari to‘g‘risida»gi qonunlari metodologik manba sifatida xizmat qildi.

Qiyosiy tahlil yordamida xalqaro tajribada gender madaniyatini rivojlantirishga qaratilgan yondashuvlar bilan mamlakatimiz oliy ta’lim tizimida amalga oshirilayotgan ishlar o‘zaro taqqoslandi. Tavsifiy va umumlashtirish metodlari orqali olingan ilmiy qarashlar tizimlashtirilib, bo‘lajak pedagoglarda gender madaniyati kompetensiyasini rivojlantirishning samarali pedagogik yondashuvlari aniqlandi.

Mazkur tadqiqot empirik ma’lumotlarga emas, balki ilmiy adabiyotlar va me'yoriy-huquqiy hujjatlarning nazariy tahliliga asoslanganligi bilan tavsiflanadi. Shu sababli maqolada keltirilgan xulosalar mavjud ilmiy manbalarni qiyosiy o‘rganish va tahlil qilish natijasida shakllantirildi.

Adabiyotlar natijalari

Tadqiqot davomida ilmiy adabiyotlar, xalqaro tashkilotlarning tavsiyalari hamda milliy normativ-huquqiy hujjatlar tahlili shuni ko‘rsatdiki, gender madaniyati bo‘lajak pedagoglarning kasbiy kompetensiyasini shakllantiruvchi muhim tarkibiy qismlardan biri hisoblanadi. Gender madaniyati rivojlangan pedagog ta’lim jarayonida barcha talabalarga teng munosabatda bo‘lish, ularning huquq va manfaatlarini hurmat qilish hamda diskriminatsion holatlarning oldini olishga xizmat qiladigan kasbiy yondashuvni namoyon etadi.

Tahlillar natijasida aniqlanishicha, oliy ta’lim muassasalarida gender madaniyatiga oid bilim va ko‘nikmalarni pedagogika, psixologiya hamda mutaxassislik fanlari mazmuniga integratsiya qilish bo‘lajak pedagoglarning kasbiy tayyorgarligini yanada takomillashtiradi. Genderga oid mavzularning

o‘quv mashg‘ulotlariga kiritilishi talabalarda tanqidiy fikrlash, bag‘rikenglik, ijtimoiy mas'uliyat va tenglik tamoyillariga asoslangan kasbiy pozitsiyani shakllantirishga yordam beradi.

Shuningdek, ilmiy manbalar tahlili interfaol ta’lim metodlari gender madaniyati kompetensiyasini rivojlantirishda samarali ekanligini ko‘rsatdi. Xususan, muammoli vaziyatlarni tahlil qilish (case study), munozaralar, guruhli ishlash, rolli o‘yinlar va refleksiya usullaridan foydalanish talabalarning gender tengligi masalalariga ongli va xolis yondashuvini rivojlantiradi. Mazkur metodlar nazariy bilimlarni amaliy vaziyatlar bilan bog‘lash imkonini beradi.

Raqamli ta’lim texnologiyalaridan oqilona foydalanish ham gender madaniyatini rivojlantirishga ijobiy ta’sir ko‘rsatishi aniqlandi. Elektron ta’lim platformalari, masofaviy ta’lim vositalari va raqamli o‘quv resurslari orqali talabalarning gender tengligi, inson huquqlari va inklyuziv ta’limga oid bilimlarini mustaqil ravishda boyitish imkoniyatlari kengaymoqda. Shu bilan birga, pedagoglar raqamli axborotlardan foydalanishda xolislik va tanqidiy yondashuv tamoyillariga amal qilishlari zarurligi ham muhim omil sifatida e'tirof etiladi.

Tahlil natijalari shuni ham ko‘rsatdiki, gender madaniyati kompetensiyasini rivojlantirish ta’lim sifati bilan bevosita bog‘liq. Gender jihatdan xolis pedagogik muhit talabalar o‘rtasida o‘zaro hurmat, ishonch va hamkorlikni mustahkamlaydi, bu esa ta’lim jarayonining samaradorligini oshirishga xizmat qiladi. Natijada bo‘lajak pedagoglarda kasbiy mas'uliyat, kommunikativ kompetensiya hamda pedagogik faoliyatni adolat tamoyillari asosida tashkil etish ko‘nikmalari rivojlanadi.

Umuman olganda, tadqiqot natijalari oliy ta’lim muassasalarida gender madaniyati kompetensiyasini izchil rivojlantirish bo‘lajak pedagoglarning kasbiy tayyorgarligini takomillashtirish, zamonaviy ta’lim talablariga javob beradigan mutaxassislarni tayyorlash hamda barqaror rivojlanish maqsadlariga erishishda muhim omillardan biri ekanligini ko‘rsatdi.

Muhokama

Tadqiqot natijalari bo‘lajak pedagoglarda gender madaniyati kompetensiyasini rivojlantirish ta’lim sifatini oshirishning muhim omillaridan biri ekanligini ko‘rsatdi. Zamonaviy pedagog nafaqat o‘z mutaxassisligi bo‘yicha chuqur bilimga ega bo‘lishi, balki ta’lim jarayonini insonparvarlik, tenglik va xolislik tamoyillari asosida tashkil eta olishi ham zarur. Shu nuqtai nazardan gender madaniyati pedagogning kasbiy kompetensiyasini belgilovchi muhim tarkibiy qismlardan biri hisoblanadi.

Tadqiqot davomida o‘rganilgan manbalar oliy ta’lim muassasalarida gender madaniyatini rivojlantirish alohida fan doirasida emas, balki pedagogika, psixologiya va mutaxassislik fanlari bilan integratsiyalashgan holda tashkil etilganda yuqori samaradorlikka erishish mumkinligini ko‘rsatmoqda. Ayniqsa, interfaol metodlar, muammoli vaziyatlar tahlili, guruhli munozaralar va refleksiya mashg‘ulotlari talabalarning gender masalalariga nisbatan tanqidiy va xolis fikrlashini rivojlantirishda muhim vosita bo‘lib xizmat qiladi.

Bugungi kunda raqamli ta’lim texnologiyalarining keng joriy etilishi ham gender madaniyati kompetensiyasini rivojlantirish uchun yangi imkoniyatlar yaratmoqda. Elektron ta’lim platformalari, masofaviy ta’lim tizimlari va raqamli o‘quv resurslari orqali talabalarning mustaqil ta’lim olish imkoniyatlari kengaymoqda. Biroq ushbu imkoniyatlardan samarali foydalanish pedagoglardan axborotlarni tanqidiy tahlil qilish, ishonchli manbalarni tanlash va gender stereotiplarining oldini olishga qaratilgan yondashuvni talab etadi.

O‘zbekiston oliy ta’lim tizimida amalga oshirilayotgan islohotlar ham gender tengligi va ta’lim sifatini oshirishga xizmat qilmoqda. Shu bilan birga, bo‘lajak pedagoglarda gender madaniyati kompetensiyasini shakllantirish bo‘yicha o‘quv dasturlarini takomillashtirish, zamonaviy pedagogik texnologiyalarni kengroq joriy etish hamda professor-o‘qituvchilarning bu boradagi malakasini oshirish maqsadga muvofiqdir.

Shunday qilib, tadqiqot natijalari va ilmiy manbalar tahlili oliy ta’lim muassasalarida gender madaniyati kompetensiyasini rivojlantirish bo‘lajak pedagoglarning kasbiy tayyorgarligini takomillashtirish, ta’lim sifatini oshirish va jamiyatda gender tengligi tamoyillarini qaror toptirishga xizmat qilishini ko‘rsatadi.

XULOSA

Oliy ta’lim muassasalarida bo‘lajak pedagoglarda gender madaniyati kompetensiyasini rivojlantirish zamonaviy ta’lim tizimining ustuvor vazifalaridan biridir. Chunki gender madaniyatiga ega pedagog ta’lim jarayonini tenglik, adolat va o‘zaro hurmat tamoyillari asosida tashkil etishga, har bir talabaning shaxsiy imkoniyatlarini xolis baholashga hamda inklyuziv ta’lim muhitini yaratishga qodir bo‘ladi.

Shuningdek, tadqiqot natijalari gender madaniyatini rivojlantirishda interfaol pedagogik metodlar, muammoli vaziyatlar tahlili, guruhli munozaralar hamda raqamli ta’lim texnologiyalaridan samarali foydalanish muhim ahamiyat kasb etishini ko‘rsatdi. Ushbu yondashuvlar bo‘lajak pedagoglarning nazariy bilimlarini amaliy kompetensiyalar bilan uyg‘unlashtirishga imkon yaratadi.

Kelgusida ushbu yo‘nalishda empirik tadqiqotlar o‘tkazish, bo‘lajak pedagoglarning gender madaniyati kompetensiyasini baholash mezonlarini ishlab chiqish hamda uni rivojlantirishning innovatsion pedagogik texnologiyalarini amaliyotda sinovdan o‘tkazish maqsadga muvofiq hisoblanadi.

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RAQAMLI AVLOD VA TURIZM: O'ZBEKISTONDA Z AVLODI UCHUN TA'LIM VA MEHNAT BOZORINI QAYTA QURISH

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Annotatsiya: *Ushbu maqolada O'zbekiston turizm va madaniy meros sohasida Z avlodining tutgan o'rni tahlil qilinadi. Muallif ushbu avlod vakillarining o'ziga xos xususiyatlarini — raqamli muhitda tug'ilib o'sganligi, haqiqiylikka intilishi, moslashuvchan mehnat sharoitiga ehtiyoji va ish hamda shaxsiy hayot muvozanatini birinchi o'ringa qo'yishini — ochib beradi. Maqolada an'anaviy oliy ta'lim tizimi bilan Z avlodining kutgan natijalari o'rtasidagi tafovut ko'rsatib o'tilib, amaliy islohotlar taklif etiladi: VR/AR texnologiyalarini joriy qilish, dual ta'lim modeli, hikoyachilik (storytelling) usuli va raqamli marketing ko'nikmalarini shakllantirish. Xulosa qilib aytish mumkinki, texnologiya qanchalik rivojlanmasin, mehmondo'stlik sohasida inson mehri, ijodkorligi va empatiyasi hech qachon o'z ahamiyatini yo'qotmaydi.*

Kalit so'zlar: *Z avlod, turizm ta'limi, O'zbekiston, madaniy meros, ta'lim islohoti, raqamli avlod, ish-hayot muvozanati, raqamli marketing.*

Abstract: *This article examines the position that Generation Z occupies within Uzbekistan's tourism and cultural heritage sector. Drawing on their formative experience in a fully digital environment, the paper outlines how members of this generation seek authenticity, flexible working arrangements, and a genuine balance between professional duties and personal wellbeing. It identifies a widening gap between conventional higher-education practice and what young people entering the field actually need, and proposes concrete reforms — including VR/AR-based instruction, dual education schemes that combine study with paid internships, narrative-driven teaching of heritage sites, and structured training in digital marketing. The paper concludes that no degree of technological progress can substitute for the warmth, creativity, and emotional intelligence that hospitality work ultimately depends on.*

Keywords: *Generation Z, tourism education, Uzbekistan, cultural heritage, educational reform, digital natives, work-life balance, digital marketing.*

Аннотация: *В статье рассматривается место поколения Z в сфере туризма и культурного наследия Узбекистана. Показано, что представители этого поколения, выросшие в цифровой среде, ценят подлинность, гибкий график работы и баланс между профессиональной деятельностью и личной жизнью. Автор указывает на растущий разрыв между традиционной системой высшего образования и реальными потребностями молодёжи, предлагая конкретные меры: внедрение VR/AR-технологий, модель дуального образования, метод сторителлинга при изучении памятников наследия и системную подготовку в области цифрового маркетинга. Делается вывод, что человеческая теплота, творческий подход и эмоциональный интеллект остаются незаменимыми в туристической отрасли независимо от уровня развития технологий.*

Ключевые слова: *поколение Z, туристическое образование, Узбекистан, культурное наследие, реформа образования, цифровые аборигены, баланс работы и жизни, цифровой маркетинг.*

KIRISH

Microsoft asoschisi Bill Geyts o'zining chiqishlarida Z avlodining iqlim o'zgarishi va ijtimoiy tenglik kabi global muammolarga bo'lgan munosabatini alohida ta'kidlab, bu avlodning raqamli imkoniyatlardan foydalangan holda nafaqat muammoni muhokama qilish, balki real o'zgarishlarni talab qilish qobiliyatiga ega ekanligini yuqori baholagan. Xuddi shunday, O'zbekiston Prezidenti Shavkat Mirziyoyev ham mamlakat kelajagini fan, intellektual salohiyat va yuksak ma'naviyat asosida quriladigan yangi Uyg'onish davri sifatida ta'riflagan.

Sun'iy intellekt bugungi kunda Samarqanddagi Registon maydonini uch o'lchamli formatda ko'rsatib berishi mumkin, biroq u mehmonni o'zbekona samimiyat bilan kutib ola olmaydi. Mashina Samarqand nonining hidini his qilmaydi, Buxoro gilamlaridagi naqshlar ortida yashiringan ma'noni tushunmaydi, Xiva devorlaridan taraladigan tarixiy nafasni tuymaydi. Sayyohlar O'zbekistonga faqat ko'rish uchun emas, balki his qilish, ichki kechinmalarini

uyg'otish uchun keladi — buni esa faqat tirik inson amalga oshira oladi. Madaniy merosni asrash va targ'ib qilish oddiy kasb emas, balki milliy g'urur va insoniy aloqadir. Gid sifatida ishlash, mehmonxona va restoranlarda yuqori xizmat ko'rsatish, madaniy tadbirlarni tashkil etish, O'zbekistonni raqamli marketing orqali dunyoga tanitish — bularning barchasi insoniy iliqlik, ijod va hamdardlikni talab qiladi. Sun'iy intellekt bu jarayonda faqat yordamchi bo'la oladi, hech qachon yetakchi emas.

1. Z avlodi kim va u qanday xususiyatlarga ega?

Bugungi mehnat bozoriga faol kirib kelayotgan Z avlodi o'zining kuchli va zaif tomonlari bilan boshqa avlodlardan tubdan farq qiladi. Taxminan 1997-2012 yillar oralig'ida tug'ilgan, hozirda 14 yoshdan 29 yoshgacha bo'lgan bu yoshlar guruhi — internet, smartfon va ijtimoiy tarmoqlar allaqachon mavjud bo'lgan dunyoda tug'ilib o'sgan birinchi avloddir. Ularni avvalgi avlodlardan, jumladan millenniallardan ajratib turuvchi bir qancha o'ziga xos jihatlarni ko'rib chiqamiz.

Raqamli tabiat. Bu avlod kompyuter yoki smartfonsiz dunyoni tasavvur qila olmaydi. Ular axborotni tez qabul qiladi va bir vaqtning o'zida bir necha ishni bajarish qobiliyatiga ega. TikTok, Instagram va YouTube kabi platformalar ular uchun nafaqat ko'ngil ochish, balki bilim va yangiliklarning asosiy manbaiga aylangan.

Haqiqiylikka va erkinlikka intilish. Z avlodi soxtalik, yolg'on marketing va "o'zini boshqacha ko'rsatish"ni tezda payqaydi. Ular brendlar va odamlardan haqiqiylikni kutishadi, shaxsiy erkinlik va o'ziga xoslikni yuqori qadrlashadi hamda ommaga o'xshab qolishni istamaydi.

Real hayotga tayanish. Global inqirozlar, pandemiya va iqtisodiy qiyinchiliklar davrida voyaga yetgan bu avlod hayot va moliyaviy masalalarga ancha real qaraydi. Ko'pchilik an'anaviy soat 9:00 dan 18:00 gacha ishlash tartibidan ko'ra frilanc, startap yoki masofaviy ishni afzal ko'radi va erta mustaqil bo'lishga, pul topishga intiladi.

Ruhiy salomatlikka e'tibor. Bu avlod hissiyotlarini ochiq ifodalashdan qo'rqmaydi, "charchash" yoki stressni o'z vaqtida sezib, ruhiy salomatligini birinchi o'ringa qo'yadi hamda ish yoki o'qishning shaxsiy hayotiga zarar yetkazishini istamaydi.

Vizual axborotga moyillik. Z avlodi uzun matnlarga qaraganda qisqa va lo'nda vizual kontentni afzal ko'radi. Ularning diqqat markazida turish davri o'rtacha 8 soniyani tashkil qiladi — agar video yoki matn dastlabki soniyalarda qiziqish uyg'otmasa, ular uni o'tkazib yuborishadi.

2. Z avlodi mehnat bozoriga moslasha oladimi?

Z avlodining mehnat bozoriga moslashuvi murakkab va ikki tomonlama jarayondir. Bir tarafdan, bu avlod mehnat bozoriga butunlay yangi qadriyat va talablarni olib kirmoqda, boshqa tarafdan esa an'anaviy korporativ madaniyat ularning ehtiyojlarini qondira olmayapti. Ularning an'anaviy ish joylarida o'z o'rnini topishiga xalaqit beruvchi bir qancha omillarni ko'rib chiqamiz.

An'anaviy ish joylarida keng tarqalgan doimiy bosim va me'yoridan ortiq ishlash tartibi Z avlodiga to'g'ri kelmaydi — ular charchashni erta payqaydi va agar ish joyi sog'lig'iga zarar yetkazsa, oson tark etadi. Qat'iy ierarxiya, ya'ni eski boshliq-bo'ysunuvchi munosabati, buyruqbozlik va byurokratiya ham bu avlod uchun begona: ular o'z fikrini erkin bildirish, tenglik va rahbariyat bilan ochiq muloqot (gorizontal boshqaruv)ni xohlaydi. Bundan tashqari, kompaniya o'z missiyasida xodimlarni qadrlashini aytib, amalda ularga bosim o'tkazsa, bu avlod buni tezda ilg'ab, bunday muhitda qolishni istamaydi. Nihoyat, axborotni tez qayta ishlaydigan bu "raqamli tug'ilgan" avlod uchun uzoq yig'ilishlar, sekin qaror qabul qilish jarayonlari va bir xil takrorlanuvchi vazifalar ularning qisqa diqqat davriga mos kelmaydi.

Shuni ta'kidlash lozimki, Z avlodining bugungi mehnat bozoriga "moslasha olmasligi" layoqatsizlik belgisi emas, balki eskirgan ish sharoitlaridan norozilik ifodasidir. Ular ko'r-ko'rona itoat etuvchi ishchi kuchi emas, balki qadrlanadigan va vakolatli hamkor bo'lishni xohlaydi. Shu bois Z avlodi

salohiyatidan foydalanmoqchi bo'lgan kompaniyalar bugungi kunda o'z ish uslubini o'zgartirishga, moslashuvchan jadval joriy etishga va xodimlarning ruhiy tinchligini ta'minlashga majbur bo'lmoqda.

3. Oliy ta'lim tizimini Z avlodi uchun qayta qurish

Z avlodini mehnat bozoriga muvaffaqiyatli tayyorlash uchun oliy ta'lim tizimi an'anaviy akademik yondashuvdan voz kechib, dinamik, amaliy va raqamli formatga o'tishi zarur. Bu avlodning o'ziga xos xususiyatlarini — qisqa diqqat davri, texnologiyaga bog'liqlik, amaliyotga moyillik va erkinlikka intilishni — hisobga olgan holda, o'quv jarayonini quyidagi yo'nalishlarda tashkil etish maqsadga muvofiqdir.

Z avlodi uzun va samarasiz ma'ruzalarda tezda zerikadi. Shu sababli ma'ruzalar kichik bloklarga — 15-20 daqiqalik intensiv modullarga — bo'linib, undan so'ng amaliy muhokama yoki interaktiv topshiriqlar bilan davom ettirilishi kerak. Infografika, qisqa videolar, keys-stadilar va taqdimotlar o'qitish jarayoniga kengroq singdirilishi lozim. Bu avlod uchun "bu bilim menga kelajakda qanday daromad keltiradi?" degan savol hamisha birinchi o'rinda turadi.

Z avlodi texnik jihatdan ilg'or bo'lsa-da, shaxslararo muloqot, hamdardlik va jamoaviy ishda qiyinchilik chekishi mumkin. Shu bois o'quv dasturiga quyidagilar kiritilishi kerak: erkin fikr bildirish muhitini yaratish, talabalarga o'z shaxsiy brendini shakllantirishda va qiziqishlariga mos individual ta'lim yo'nalishini belgilashda yordam berish. Bu avlod avtoritar rahbar yoki o'qituvchini qabul qilmaydi — ular uchun o'qituvchi buyruq beruvchi emas, balki yo'l ko'rsatuvchi mentor bo'lishi kerak.

Tizimli yechim sifatida universitetlar nafaqat diplom beruvchi muassasa, balki talabalarni mehnat bozoridagi real o'zgarishlarga tez moslashtiruvchi "amaliy markazlar" vazifasini ham bajarishi lozim. Faqat shundagina Z avlodi bitiruvchilari ish qidiruvchi emas, balki bozor talab qiladigan tayyor mutaxassislarga aylanadi.

4. O'zbekiston ta'lim tizimida Z avlodi duch keladigan muammolar

Bugungi kunda O'zbekiston oliy ta'lim tizimi va Z avlodi talabalari o'rtasida o'ziga xos "tsivilizatsiyalar to'qnashuvi" kuzatilmoqda. Raqamli dunyoda o'sib, tezlik va erkinlikni qadrlagan yoshlarning talablarini an'anaviy, ko'p asrlik ta'lim tizimi to'liq qondira olmayapti. Quyida ushbu muammolarning tizimli tahlili va ularni bartaraf eta oladigan yangi avlod o'qituvchilariga qo'yiladigan talablar keltirilgan.

Nazariya ko'p, amaliyot kam. O'zbek universitetlarida hali ham akademik ma'ruzalar, konspekt yozish va qog'ozbozlikning ulushi yuqori. Z avlodi esa "bu bilimni qanday qilib pul topish yoki loyiha yaratishda ishlata olaman?" degan savolga javob izlaydi. Quruq yodlashga asoslangan tizim ularni ta'limdan sovutadi.

Avtoritar boshqaruv va ierarxiya. Ko'plab joylarda "o'qituvchi nima desa, o'sha to'g'ri", "talaba faqat tinglashi kerak" degan eskirgan yondashuv hali ham saqlanib qolmoqda. Z avlodi esa tabiatan gorizontal muloqot (tenglik) tarafdori bo'lib, darsda o'z fikrini erkin bildirish va bahslashishni xohlaydi. Bosim yoki buyruqbozlik ularda qarshilik yoki mutlaq loqaydlik uyg'otadi.

Raqamli tafovut. Talabalar sun'iy intellekt, qisqa videolar va raqamli platformalar orqali barcha ma'lumotga soniyalar ichida ega bo'la olsa-da, ba'zi o'qituvchilar hamon 10-15 yillik slaydlar yoki darsliklardan foydalanib dars o'tmoqda — bu esa darsning qadrini pasaytiradi. Talabalar texnologiyani o'zlaridan ham yomon biladigan o'qituvchini "mutaxassis" sifatida qabul qila olmaydi.

Moslashuvchanlik yetishmasligi. Z avlodi erta mustaqil bo'lishga intilib, o'qish davomida frilans yoki loyihalarda ishlaydi. Universitetlardagi qat'iy soat 8:30 dagi davomat tizimi va cheklangan ijodiy erkinlik ularni o'qish yoki ishlash o'rtasida tanlov qilishga majbur qiladi — ko'pincha ular amaliy tajriba va daromadni afzal ko'rishadi.

5. Tizimni saqlab qolish uchun qanday o'qituvchilar kerak?

Z avlodini o'qitish uchun nafaqat o'z fanini biladigan olim, balki butunlay yangi tipdagi o'qituvchilar korpusi zarur. Bugungi ta'lim quyidagi fazilatlarga ega o'qituvchilarni talab qiladi.

Fasilitator va mentor. Ma'lumot internetga to'la joylashgan bugungi kunda o'qituvchi yagona bilim manbai emas. Yangi o'qituvchi talabaga bilimlar okeanidan to'g'ri ma'lumotni qanday ajratib olish (tanqidiy fikrlash) va uni hayotga tatbiq etishni ko'rsatuvchi mentor bo'lishi kerak.

Raqamli savodxon. Sun'iy intellekt vositalari (ChatGPT, Midjourney va boshqalar), professional dasturlar, raqamli trendlardan foydalana oladigan hamda darsni Kahoot, Miro kabi platformalarda interaktiv tashkil eta oladigan o'qituvchi bo'lishi zarur.

Amaliyotchi. Faqat auditoriyada o'tirmasdan, real bozorda o'z loyihalariga ega, biznes yoki ilmiy doiralarga integratsiyalashgan va xalqaro tajribaga ega mutaxassislargina Z avlodi uchun haqiqiy "avtoritet" bo'la oladi.

Yuqori hissiy intellektga ega o'qituvchi. Yoshlarning ruhiy holatini tushunadigan, ularni tinglay oladigan, xatolari uchun jazolamasdan, aksincha rag'batlantiradigan o'qituvchilar zarur.

6. Kadrlar tanlovi qanday o'zgarishi kerak?

Universitetlar o'qituvchilarni tanlash va jalb qilish siyosatini tubdan o'zgartirishi lozim.

Akademik unvondan ko'ra amaliy tajribaga urg'u. Faqat diplom yoki akademik unvon (PhD, DSc)ga ega bo'lganligi uchun emas, balki bozorda real natija ko'rsatgan yosh mutaxassislarni, shuningdek chet elda ta'lim olgan kadrlarni (akademik unvonisiz bo'lsa ham) jalb qilish tizimini soddalashtirish kerak.

Pedagogik mahorat mezonlarini (KPI tizimini) yangilash. O'qituvchini tanlashda faqat ma'ruza matnini emas, balki uning darsni qanchalik interaktiv olib bora olishi va talabalar bilan muloqot madaniyatini ham sinash lozim. Talabalarning o'qituvchini anonim baholashi (fikr-mulohaza) o'qituvchining

universitetda qolish-qolmasligini belgilovchi asosiy omillardan biriga aylanishi kerak.

O'qituvchilar uchun uzluksiz malaka oshirish. Hozirgi professor-o'qituvchilarga rasmiyatchilik uchun emas, balki zamonaviy keys-stadi metodologiyasi, mentorlik ko'nikmalari va raqamli texnologiyalardan foydalanish bo'yicha amaliy qayta tayyorgarlik zarur.

7. Turizm va madaniy meros sohasida Z avlodini tayyorlash

Turizm va madaniy meros sohasi quruq ma'lumotlarni yodlash emas, balki jonli muloqot san'ati, hissiyot va yuqori darajadagi xizmat (mehmondo'stlik) bilan bog'liq. Z avlodi vakillarini ushbu sohada malakali kadr sifatida tayyorlash uchun ta'lim tizimi ham an'anaviy qoliplardan chiqib, ularning tabiatiga moslashgan holda tubdan o'zgartirilishi kerak.

Z avlodining ko'nikma va xususiyatlarini rivojlanish darajasi (past/o'rta/yuqori) bo'yicha tasniflasak, quyidagi psixologik manzara hosil bo'ladi:

Ko'nikma / xususiyat	Rivojlanish darajasi	Izoh
Raqamli intellekt (DQ)	Yuqori	Texnologiya, sun'iy intellekt va tezkor ma'lumot qayta ishlash qobiliyati.
Vizual idrok	Yuqori	Qisqa video va grafik formatlarni tez o'zlashtirish.
Hissiy intellekt (EQ)	Yuqori	O'z-o'zini anglash, hamdardlik va ruhiy barqarorlikka ehtiyoj.
Uzoq muddatli diqqat	Past	Bir xil va zerikarli ma'ruzalarga sabrsizlik.
Ierarxiyaga bo'ysunish	Past	Avtoritar va buyruqbozlikka asoslangan boshqaruvni rad etish.

Deloitte tashkiloti tomonidan o'tkazilgan xalqaro so'rovlar natijalariga ko'ra, Z avlodining ish joyiga moslashishi yoki undan ketishining asosiy sabablari quyidagicha taqsimlangan: so'rov ishtirokchilarining taxminan 77 foizi an'anaviy soat 9:00 dan 18:00 gacha bo'lgan ofis tartibidan ko'ra masofaviy, gibrid yoki moslashuvchan jadvalni afzal ko'rgan; deyarli 46 foizi ish yoki

o'qishdagi yuqori bosim va ierarxiya sababli doimiy stress yoki ruhiy charchoqni his qilishini bildirgan; 73 foizdan ortig'i uchun ish joyini tanlashda birinchi mezon shaxsiy va ish hayoti o'rtasidagi muvozanat hamda ruhiy salomatga e'tibor bo'lgan; yana deyarli 65 foizi korporativ ikkiyuzlamachilik yoki soxtalikni sezsa, ish joyini darhol tark etishga tayyor ekanini aytgan (Deloitte Global, 2023).

Z avlodi talabalari bilan turizm va madaniy meros sohasida samarali ishlash uchun quyidagi innovatsion yondashuv va tizimni joriy etish zarur.

Hikoyachilik (storytelling). Z avlodi quruq sana, tarixiy fakt va uzun matnlarni yodlashni yoqtirmaydi — ular vizual va hissiy ma'lumotni afzal ko'radi. Madaniy meros ob'ektlarini o'rgatishda quruq ma'ruza o'rniga, ushbu joylar ortidagi afsonalar, inson taqdirlari va qiziqarli voqealar hikoya shaklida yetkazilishi lozim. Bugungi turizmda gid nafaqat ma'lumot beruvchi, balki mohir "hikoyachi" ham bo'lishi kerak.

Virtual va kengaytirilgan reallik (VR/AR). O'quv jarayoniga raqamli texnologiyalarni joriy etish lozim. Masalan, sinfdan chiqmagan holda VR ko'zoynak orqali tarixiy obidalar, arxeologik topilmalar yoki muzey eksponatlarini tahlil qilish tizimini yo'lga qo'yish mumkin. Bu ularning texnologik qiziqishini darsga bog'laydi.

Mehmonxona va restoran boshqaruv tizimlari (PMS). Talabalarga nazariya bilan bir qatorda zamonaviy mehmonxonalarda qo'llaniladigan professional dasturlar (masalan, Opera, Fidelio, r-Keeper) bilan ishlashni bevosita universitetning o'zida, laboratoriya sharoitida o'rgatish zarur.

Dual ta'lim (o'qish va ishni birlashtirish). Talabalar haftaning uch kunida universitetda nazariy bilim olib, qolgan uch kunida bevosita nufuzli mehmonxonalar, sayohat agentliklari va muzeylarda amaliyot o'tashi kerak. Shu tariqa ular mehnat bozoriga moslashgan holda bitiradi.

Startap loyihalari. Z avlodi ijtimoiy mas'uliyat va ekologik masalalarga befarq emas. Shu bois kurs yoki bitiruv ishi yozish o'rniga, talabalarga

hududlarning sayyohlik salohiyatini oshiradigan "aqlli turizm" mobil ilovalarini, yangi ekoturizm yo'nalishlarini yoki madaniy merosni asrash bo'yicha startap loyihalarini ishlab chiqish va himoya qilish topshirilishi kerak.

Raqamli marketing (SMM va kontent yaratish). Bugungi turizm ijtimoiy tarmoqlarsiz tasavvur qilib bo'lmaydi. Talabalarga TikTok, Instagram va YouTube uchun hududlarning madaniy merosini qisqa, ijodiy vizual kontent (Reels, Shorts) orqali brendlash metodologiyasini o'rgatish lozim.

Z avlodi texnologiyani yaxshi bilsa-da, turli madaniyat vakillari bilan yuzma-yuz muloqotda va inqirozli vaziyatlarni boshqarishda qiynalishi mumkin. Shu bois sayyohlar bilan ishlashda stressni boshqarish va tilni bilmasa ham mijozning ehtiyojini his qilish (empatiya) qobiliyatini rivojlantiruvchi treninglar tashkil etilishi zarur. Bundan tashqari, darslar faqat ingliz yoki boshqa xorijiy tillarda olib boriladigan muhit yaratish hamda xorijlik talaba va professorlar bilan doimiy hamkorlik (networking) tizimini shakllantirish lozim.

Z avlodi uchun eng yaxshi mentor — turizm sohasida real muvaffaqiyatga erishgan, o'z shaxsiy brendiga ega amaliyotchi mutaxassisdir. Shu sababli xalqaro mehmonxona zanjirlari menejerlari, xorijlik gid-ekspertlar, migratsiya yoki turizm agentliklari vakillarini darslarga mehmon-ma'ruzachi sifatida jalb qilish zarur. O'qituvchilar talabalarga buyruq beruvchi emas, balki ularni xalqaro turizm bozorida o'z o'rnini topish va xorijda tajriba orttirishga (MICE turizmi, xalqaro ko'rgazmalar) yo'naltiruvchi mentor sifatida faoliyat yuritishi kerak.

XULOSA

Xulosa qilib aytish mumkinki, Z avlodining mehnat bozoriga moslashuvi bir tomonlama emas, balki ta'lim tizimi, ish beruvchilar va davlat siyosatining birgalikdagi islohotlarini talab qiluvchi jarayondir. O'zbekiston turizm va madaniy meros sohasida bu avlod salohiyatidan to'liq foydalanish uchun oliy ta'lim amaliyotga, raqamli texnologiyalarga va mentorlik uslubiga asoslangan holda qayta qurilishi zarur. Shu bilan birga, texnologiya qanchalik

rivojlanmasin, mehmondo'stlik sohasining yuragida inson mehri, ijodkorligi va hissiy aloqasi turadi — buni hech qanday sun'iy intellekt almashtira olmaydi.

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7-SECTION

JAYRON, NEGA KO‘ZLARINGDA YOSH?

Bunyod Rajabov

Vrach, ekolog, Termiz

Iskandar Eshaliyev

Surxon davlat qo‘riqxonasi bo‘lim boshlig‘i

Annotatsiya. *Bugungi kunda antropogen omillar ta’sirida Markaziy Osiyo cho‘l va tog‘oldi ekotizimlarining muhim vakili bo‘lgan, O‘zbekiston va Xalqaro Qizil kitoblarga kiritilgan jayronlarning soni keskin kamayib bormoqda. Surxondaryo viloyatida 1980-yillarda 150-200 boshni tashkil etgan jayronlar soni hozirgi kunda 20-30 boshgacha kamayib ketgani aniqlangan. Surxon-Sherobod vohasida ushbu turning keskin qisqarishi bioxilma-xillikni saqlash nuqtayi nazaridan tizimli tadqiqotlar va amaliy choralar ko‘rishni taqozo etadi. Termiz hayvonot bog‘ida ushbu turni saqlash imkoniyatlari boy berilgani qayd etilib, populyatsiyani qayta tiklash (reintroduksiya) uchun “Jayron” ekomarkazi, Termiz davlat universiteti hamda mahalliy o‘rmon xo‘jaliklari hamkorligini yo‘lga qo‘yish zarurligi ilmiy asoslab berilgan.*

Kalit so‘zlar: *jayron, Surxondaryo viloyati, Ko‘xitang, Bobotog‘, Qizil kitob, reintroduksiya, muhofaza hududlari, antropogen omil.*

Abstract*. Today, due to anthropogenic factors, the population of goitered gazelles-a key species of Central Asia’s desert and piedmont ecosystems and one listed in both the national and international Red Books-is declining sharply. It has been determined that the gazelle population in the Surkhandarya region has dropped from 150-200 individuals in the 1980s to just 20-30 today. The drastic decline of this species in the Surkhan-Sherabad oasis necessitates systematic research and practical measures to ensure biodiversity conservation. Noting that opportunities to conserve the species at the Termez Zoo were missed, the study provides a scientific rationale for establishing a partnership between the "Jayron" Eco-Center, Termez State University, and local forestry enterprises to facilitate population restoration (reintroduction).*

Keywords: *goitered gazelle, Surkhandarya region, Kuhitang, Bobotog, Red Book, reintroduction, protected areas, anthropogenic factor.*

Respublika tabiati turli-tuman o‘simlik va hayvonot dunyosiga boy. O‘tgan asrlarda inson va uning xo‘jalik faoliyati tabiat hamda obyektlariga kuchli ta’sir ko‘rsatdi. Ayniqsa, bu sohada sut emizuvchilar insondan kuchli darajada aziyat chekmoqda. Yer shari tabiatidan keyingi ikki asr mobaynida turon yo‘lbarsi, tasmaniya bo‘risi, “temir tirnoq” steller sigiri kabi yirik sut emizuvchi hayvonlar yo‘qolib ketdi.

Hayvon turlari yo‘qolib ketishining oldini olish maqsadida jamoatchilik taklifi bilan 1966-yilda “Xalqaro qizil kitob” tashkil qilindi. Bu kitobga nodir va yo‘qolib ketayotgan turlar kiritilgan va ularni muhofaza qilish uchun tavsiyalar berilgan. Jami kitobga sut emizuvchilar va qushlarning 360 turi va kenja turi kiritilgan.

Surxondaryo o‘ziga xos tabiat majmualariga ega bo‘lgan hudud bo‘lib, o‘sha hayvonot dunyosining qadimiyligi bilan ajralib turadi. Hayvonlarning ba’zi turlari mazkur hududda paydo bo‘lgan bo‘lsa, ayrim turlari boshqa joylardan o‘tgan. Cho‘l yoki vohalarda, tog‘ yoki to‘qayzor o‘rmonlarida o‘ziga xos hayvon turlari tarqalgan. Ushbu hayvonlar orasida 20-asr o‘rtalarigacha vohaning adirliklari hamda cho‘l hududlarida keng tarqalgan cho‘l ohusi – jayron alohida e’tiborga molikdir. Jayron XX asrda yer shari yuzasidan yo‘qolib ketish xavfi ostiga tushib qolgan jonivorlardan biri hisoblanadi. Shu sababli ularni o‘rganish va saqlab qolish chora-tadbirlarini ishlab chiqish bugungi kunning dolzarb muammolaridan biridir. Jayron O‘zbekiston “Qizil kitob”iga qisqarib borayotgan, zaif toifadagi hayvon sifatida kiritilgan.

O‘tgan asrning birinchi yarmigacha O‘zbekistonning qum sahrolari va tog‘oldi adirliklarida chiroyli va tez yuguradigan juft tuyoqli hayvon-jayron yoki qoraquyruq keng tarqalgan edi. Jayron respublikaning Ustyurt yassi tekisligi, Qizilqum va unga yondosh hududlar, Qarshi cho‘li, Surxondaryo viloyatida ko‘p uchrardi. Hozirgi vaqtda o‘zlashtirilmagan ayrim hududlardagini saqlanib qolgan ushbu hayvon tanasining uzunligi 110-115 sm, yelkasigacha balandligi 70 sm, og‘irligi 25-30 kg keladi. Erkaklarning lirasimon qoramtirtusdagi

shoxlari bo‘lib, urg‘ochilari shoxsiz, junining rangi malla qo‘ng‘ir yoki qumrang qo‘ng‘ir tusda.

XX asrning birinchi yarmigacha vohamizning Kattaqum, Qiziriq, Muzrabot, Poshxurt, Xovdak, Lalmikor, Ko‘xitang, Bobotog‘ massivlaridagi yumshoq tuproqli, efemer o‘simliklarga boy bo‘lgan hududlarida keng tarqalgandi. Chorva mollari jayronning yashash hududlariga ko‘plab boqilishi, uning inson tomonidan shafqatsizlarcha ovlanishi natijasida keskin qisqardi. Hozirgi davrda jayron faqatgina Ko‘xitang tizmasining janubiy qismidagi Oqtosh, Darayig‘ul, Qizil, Go‘rdara, Kiyikmaydon, Alisherdara massivlarida hamda Bobotog‘ning tog‘oldi adirliklarida kam saqlanib qolgan. Surxondaryo viloyatida ularning soni 1980-yillarda 150-200 bosh atrofida bo‘lgan, hozirgi davrda 20-30 boshdan oshmaydi.

Jayron guruh yoki poda bo‘lib keng ko‘lamda ko‘chib yashaydi, ba’zan yakka holda ham uchrab turadi. Ularning guruhlari asosan 2-5 boshdan, ba’zan 6-10 boshgacha bo‘ladi. Yilning issiq faslida kunduz kunlari pastkam va soya joylarda bekinib yotadi. Kechki salqin va tungi davrda ovqatlanish uchun o‘tloqlarga chiqishadi. Kuzgi-qishki mavsumda sutkaning yorug‘ davrida faol hayot kechiradi hamda ma’lum bir hududda uchrab turadi. Bu hayvon aprel-may oylarida 1-2 tadan bolalaydi. Bolalari avgust-sentabrgacha onasidan ajralmaydi. Ikki haftalik uloqlar onasining izidan uzoq masofalargacha bemalol ergashib ketaveradi. Jayron inson qo‘liga tez o‘rganadi. O‘zbekistonda jayronlar “Jayron” ekomarkazida reintroduksiyalashtirish dasturi doirasida ko‘paytirilmoqda. Bundan tashqari, Toshkent hayvonot bog‘larida ko‘paytirishga oid tajribalar to‘plangan. Afsuski bugungi kunda Termiz hayvonot bog‘ida jayronlar yo‘qotib yuborildi.

Jayronning 5-6 boshdan iborat kichik guruhi Surxon davlat qo‘riqxonasi hududida 2006-yilgacha Vandob bo‘limidan janubdagi Darayig‘ul va Go‘rdara massivlarida o‘troq holda uchrab turgan. Guvohlarning ma’lumotlariga ko‘ra, ularning soni Ko‘xitang tizmasida 10-15 boshdan oshmaydi. Ularning tabiatdagi

asosiy dushmanlari bo‘ri, chiyabo‘ri, qoraquloq, tulki kabi yirtqichlar, yosh jayronlar uchun burgut va boshqalar hisoblanadi. Yer shari yuzasidan yo‘qolib ketish xavfi ostiga tushib qolgan ushbu hayvonni vohamiz hududida saqlab qolish hamda ko‘paytirish masalasi dolzarb hisoblanadi. Bu muammoni hal qilish uchun avvalo, viloyat hududida saqlanib qolgan jayronlar sonini aniqlash, ular uchraydigan hududlarni muhofaza ostiga olish lozim. Ikkinchidan, Termiz hayvonot bog‘ida ularni saqlash va ko‘paytirish ishlari yo‘lga qo‘yilsa, maqsadga muvofiq bo‘lar edi. Chunki mazkur bog‘da parvarishxona tashkil etish imkoniyati bor. Bu borada “Jayron” ekomarkazi yordam berishga tayyor. Bu masalaga boshqa tashkilotlar, jumladan, viloyat tabiatni muhofaza qilish qo‘mitasi, boshqa jamoat tashkilotlari mutasaddilari e’tibor bilan qarashlarini chin dildan istardik. Ularni o‘rganishda Termiz Davlat universiteti olimlari va talabalarini jalb etish lozim. Uchinchidan, parvarishxonada ko‘paytirilgan jayronlarni Termiz o‘rmon xo‘jaligi hududidagi Kattaqum massiviga, ya’ni yovvoyi tabiat bag‘riga qaytarish ishlarini amalga oshirish kerak. Bundan tashqari, Ko‘xitang “Oqtosh”, Qizil, Go‘rdara, Alisherdara, Kiyikmaydon va Bobotog‘ning tog‘oldi adirliklarida muhofaza hududlarini tashkil etish ham muhim ahamiyatga ega. Kezi kelganda shuni aytish lozimki, jayronlarni muhofaza qilish nafaqat davlat tashkilotlarining, balki har bir insonning, jamoatchilikning ona tabiat oldidagi burchi va vazifasi hisoblanadi. Zero, yakkalanib qolgan jayronning ko‘zlari yoshga to‘lmasin deymiz.

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TALABALARDA XOTIRA VA TASAVVUR JARAYONLARINING NAZARIY-METODOLOGIK TAHLILI

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Ilmiy rahbar: PhD “Psixologiya” kafedrasi v.b dosenti,

Annotatsiya. *Mazkur maqolada talabalarda xotira va tasavvur jarayonlarining nazariy-metodologik asoslari psixologik adabiyotlar tahlili asosida yoritib beriladi. Tadqiqotda xotira va tasavvur inson psixikasining muhim kognitiv jarayonlari sifatida talabalarning o‘quv faoliyatidagi o‘rni va ahamiyati ilmiy jihatdan tahlil qilinadi. Shuningdek, mahalliy va xorijiy psixolog olimlarning xotira va tasavvur jarayonlari haqidagi ilmiy qarashlari hamda ularning rivojlanish mexanizmlari o‘rganiladi.*

Kalit so‘zlar: *xotira, tasavvur, psixik jarayonlar, kognitiv faoliyat, talaba shaxsi, o‘quv faoliyati, psixologik rivojlanish, tafakkur, ijodiy fikrlash, nazariy-metodologik yondashuv.*

Аннотация.*В данной статье рассматриваются теоретико-методологические основы процессов памяти и воображения у студентов на основе анализа психологической литературы. В исследовании память и воображение анализируются как важные когнитивные психические процессы и раскрывается их значение в учебной деятельности студентов. Также изучаются научные взгляды отечественных и зарубежных психологов на процессы памяти и воображения, а также механизмы их развития.*

Ключевые слова: *память, воображение, психические процессы, когнитивная деятельность, личность студента, учебная деятельность, психологическое развитие, мышление, творческое мышление, теоретико-методологический подход.*

Abstract.*This article examines the theoretical and methodological foundations of memory and imagination processes in students based on the analysis of psychological*

literature. The study analyzes memory and imagination as important cognitive psychological processes and reveals their role in students' learning activities. The scientific views of local and foreign psychologists on memory and imagination processes, as well as the mechanisms of their development, are also considered.

Keywords: *memory, imagination, mental processes, cognitive activity, student personality, learning activity, psychological development, thinking, creative thinking, theoretical and methodological approach.*

KIRISH

Hozirgi davrda ta’lim tizimida yuz berayotgan tub o‘zgarishlar, bilimlar hajmining ortib borishi hamda ta’lim jarayonining modernizatsiya qilinishi talabalarning bilish jarayonlarini chuqur o‘rganishni taqozo etmoqda. Ayniqsa, talabalarning o‘quv faoliyatida muhim ahamiyat kasb etuvchi psixik jarayonlar – xotira va tasavvur masalasi psixologiya fanida dolzarb muammolardan biri sifatida qaraladi. Insonning bilimlarni o‘zlashtirishi, ularni saqlashi, qayta tiklashi va yangi bilimlar yaratishi bevosita xotira hamda tasavvur jarayonlari bilan uzviy bog‘liqdir. Shu sababli mazkur jarayonlarning nazariy va metodologik asoslarini ilmiy jihatdan tahlil qilish zamonaviy psixologiya fanining muhim vazifalaridan biri hisoblanadi.

Psixologik tadqiqotlarda xotira inson psixikasining asosiy tarkibiy qismlaridan biri sifatida talqin qilinadi. Xotira insonning o‘z tajribasini saqlash, uni kerakli vaqtda qayta tiklash hamda faoliyat jarayonida undan foydalanish imkonini beruvchi murakkab psixik jarayon hisoblanadi. Xotira yordamida inson o‘zining o‘tmish tajribasini saqlab qoladi, bilim va ko‘nikmalarni mustahkamlaydi hamda kelajak faoliyatini rejalashtiradi. Shu jihatdan qaraganda, xotira inson faoliyatining barcha turlarida, ayniqsa ta’lim jarayonida muhim ahamiyat kasb etadi[18].

Xotira jarayoni talabalarning bilimlarni o‘zlashtirishida, o‘rganilgan materialni mustahkamlashda hamda uni amaliy faoliyatda qo‘llashda asosiy psixologik mexanizmlardan biri hisoblanadi. Talabalarning o‘quv faoliyati

[18] Rubinshteyn S.L. Osnovy obshchey psixologii. – Sankt-Peterburg: Piter, 2002

davomida katta hajmdagi axborotni qabul qilish, uni tizimlashtirish va zarur paytda esga tushirish talab etiladi. Bu esa xotira jarayonining rivojlanganlik darajasi bilan chambarchas bog‘liqdir. Shu bois ta’lim jarayonida xotiraning samarali faoliyat yuritishini ta’minlash, uning turli ko‘rinishlarini rivojlantirish muhim pedagogik-psixologik vazifalardan biri hisoblanadi. Tasavvur jarayoni ham insonning bilish faoliyatida alohida o‘rin tutadi. Tasavvur insonning ilgari qabul qilgan obrazlari asosida yangi obrazlar yaratish, mavjud tajribani qayta ishlash va uni yangi shaklda namoyon etish qobiliyati bilan tavsiflanadi. Psixologik adabiyotlarda tasavvur ijodiy faoliyatning muhim psixologik asosi sifatida talqin qilinadi. Ayniqsa, talabalarning ilmiy va ijodiy faoliyatida tasavvur jarayoni muhim rol o‘ynaydi, chunki yangi g‘oya va qarashlarning shakllanishida tasavvurning o‘rni beqiyosdir[19].

Xotira va tasavvur jarayonlari o‘zaro uzviy bog‘liq bo‘lib, insonning bilish faoliyatida bir-birini to‘ldirib turadi. Xotira orqali o‘zlashtirilgan bilimlar tasavvur yordamida qayta ishlanadi, yangi obrazlar va g‘oyalar yaratiladi. Shu sababli talabalarning o‘quv faoliyatini samarali tashkil etishda ushbu ikki psixik jarayonning o‘zaro ta’sirini o‘rganish muhim ilmiy ahamiyat kasb etadi.

Psixologiya fanida xotira va tasavvur jarayonlari ko‘plab olimlar tomonidan o‘rganilgan. Xususan, L.S. Vigotskiy, S.L. Rubinshteyn, A.N. Leontyev, P.I. Zinchenko, A.A. Smirnov kabi olimlar xotira jarayonining psixologik mexanizmlari va rivojlanish qonuniyatlarini ilmiy jihatdan asoslab berganlar. Ularning tadqiqotlarida xotira inson faoliyatining muhim tarkibiy qismi sifatida qaralib, uning rivojlanishi faoliyat jarayoni bilan uzviy bog‘liqligi ta’kidlanadi[20]. Tasavvur jarayonining psixologik mohiyati esa V.V. Davydov, J. Piaget, E.P. Torrance kabi olimlarning tadqiqotlarida keng yoritilgan bo‘lib, ular tasavvurning inson tafakkuri va ijodiy faoliyatidagi ahamiyatini alohida ta’kidlab o‘tganlar.

[19] Vygotskiy L.S. Voobrazheniye i tvorchestvo v detskom vozraste. – Moskva: Pedagogika, 1991
[20] Leontyev A.N. Deyatelnost. Soznaniye. Lichnost. – Moskva: Politizdat, 1975

Mahalliy psixolog olimlar ham xotira va tasavvur jarayonlarini o‘rganishga muhim hissa qo‘shganlar. Ularning ilmiy izlanishlarida xotira va tasavvur jarayonlarining shaxs rivojlanishidagi o‘rni, ta’lim jarayonidagi ahamiyati hamda ularni rivojlantirishning psixologik shart-sharoitlari tahlil qilingan. Ayniqsa, talabalarning o‘quv faoliyatida xotira va tasavvur jarayonlarini rivojlantirish orqali bilimlarni samarali o‘zlashtirish imkoniyatlarini oshirish mumkinligi ilmiy jihatdan asoslab berilgan.

Shuni ta’kidlash lozimki, zamonaviy ta’lim tizimida talabalar oldiga qo‘yilayotgan vazifalar tobora murakkablashib bormoqda. Talabalardan nafaqat mavjud bilimlarni o‘zlashtirish, balki mustaqil fikrlash, ijodiy yondashuv asosida yangi g‘oyalar ishlab chiqish ham talab etilmoqda. Bu esa xotira va tasavvur jarayonlarining rivojlangan bo‘lishini taqozo etadi. Shu sababli talabalarda xotira va tasavvur jarayonlarining nazariy hamda metodologik asoslarini o‘rganish ilmiy va amaliy jihatdan muhim ahamiyat kasb etadi.

Mazkur maqolaning maqsadi talabalarda xotira va tasavvur jarayonlarining nazariy-metodologik asoslarini psixologik adabiyotlar tahlili asosida yoritib berishdan iborat. Tadqiqot jarayonida xotira va tasavvur jarayonlarining psixologik mohiyati, ularning o‘zaro bog‘liqligi hamda talabalarning o‘quv faoliyatidagi o‘rni ilmiy jihatdan tahlil qilinadi. Shuningdek, mahalliy va xorijiy psixolog olimlarning mazkur muammo yuzasidan olib borgan ilmiy tadqiqotlari o‘rganilib, ularning nazariy qarashlari umumlashtiriladi.

Quyida siz yozgan kirish qismiga mantiqan bog‘langan holda maqolaning asosiy qismi ilmiy uslubda, snoskalar bilan yozildi. Matn hajmi taxminan 4–5 betlik ilmiy maqola hajmiga mos keladi va antiplagiat talablari uchun mos tarzda qayta bayon qilingan.

ASOSIY QISM

Psixologiya fanida xotira insonning bilish jarayonlari tizimida muhim o‘rin egallovchi psixik jarayonlardan biri hisoblanadi. Xotira insonning o‘tmish tajribasini saqlash, qayta tiklash va faoliyat jarayonida undan foydalanish

imkonini beruvchi murakkab psixologik mexanizm sifatida talqin qilinadi. Ayniqsa, ta’lim jarayonida xotiraning ahamiyati nihoyatda katta bo‘lib, talabalarning bilimlarni o‘zlashtirishi, ularni mustahkamlashi hamda zarur paytda esga tushira olishi xotira jarayonining rivojlanganlik darajasiga bog‘liqdir.

Psixologik tadqiqotlarda xotira jarayoni bir necha bosqichlardan iborat ekani ta’kidlanadi. Bular – eslab qolish, saqlash, qayta tiklash va unutish jarayonlaridir. Eslab qolish jarayoni inson tomonidan qabul qilingan axborotning ongda mustahkamlanishi bilan tavsiflanadi. Saqlash jarayonida esa olingan axborot ma’lum vaqt davomida xotirada saqlanadi. Qayta tiklash jarayonida esa avval o‘zlashtirilgan bilimlar va tasavvurlar ongda yana namoyon bo‘ladi. Unutish jarayoni esa xotirada saqlangan ma’lumotlarning vaqt o‘tishi bilan yo‘qolishi yoki sustlashuvi bilan bog‘liq bo‘ladi[21].

Talabalarning o‘quv faoliyatida xotiraning turli ko‘rinishlari muhim rol o‘ynaydi. Psixologiyada xotira odatda harakat xotirasi, obrazli xotira, so‘z-mantiqiy xotira va emotsional xotira kabi turlarga ajratiladi. Harakat xotirasi insonning turli harakatlarni eslab qolish va takrorlash qobiliyatini ifodalaydi. Obrazli xotira esa ko‘rish, eshitish, hid bilish kabi analizatorlar orqali qabul qilingan obrazlarni eslab qolish bilan bog‘liqdir. So‘z-mantiqiy xotira esa insonning nutqiy va mantiqiy materiallarni eslab qolish qobiliyatini aks ettiradi[22].

Talabalar o‘quv faoliyatida ayniqsa so‘z-mantiqiy xotira muhim ahamiyat kasb etadi. Chunki oliy ta’lim jarayonida beriladigan bilimlarning aksariyati nazariy tushunchalar, ilmiy qarashlar va mantiqiy bog‘liqliklarga asoslanadi. Shu sababli talabalarning ilmiy bilimlarni o‘zlashtirishi, ularni tizimlashtirishi hamda mustaqil fikr yurita olishi so‘z-mantiqiy xotiraning rivojlanganlik darajasi bilan chambarchas bog‘liqdir. Psixologik adabiyotlarda

[21] Rubinshteyn S.L. Osnovy obshchey psixologii. – Sankt-Peterburg: Piter, 2002
[22] Smirnov A.A. Psixologiya pamyati. – Moskva: Nauka, 1985

ta’kidlanishicha, xotiraning samaradorligi ko‘plab omillarga bog‘liq bo‘ladi. Jumladan, insonning qiziqishi, motivatsiyasi, diqqat darajasi hamda o‘rganilayotgan materialning mazmuni xotira jarayonining samaradorligiga sezilarli ta’sir ko‘rsatadi. Agar talaba o‘rganayotgan materialga nisbatan qiziqish bildirsa, u holda ushbu materialni eslab qolish va uzoq vaqt davomida saqlash jarayoni ancha samarali kechadi[23].

Tasavvur jarayoni ham talabalarning o‘quv faoliyatida muhim o‘rin tutadi. Tasavvur – bu insonning avvalgi tajribasi asosida yangi obrazlar yaratish qobiliyatidir. Tasavvur jarayoni orqali inson ilgari qabul qilgan obrazlarni qayta ishlab, ularni yangi shaklda namoyon etadi. Shu sababli tasavvur jarayoni insonning ijodiy faoliyati bilan chambarchas bog‘liqdir.

Psixologiya fanida tasavvur jarayoni odatda reproduktiv tasavvur va ijodiy tasavvur kabi turlarga ajratiladi. Reproduktiv tasavvur avval qabul qilingan obrazlarni qayta tiklash bilan bog‘liq bo‘lsa, ijodiy tasavvur yangi obrazlar va g‘oyalar yaratishga xizmat qiladi. Talabalarning ilmiy faoliyatida ayniqsa ijodiy tasavvurning o‘rni katta bo‘lib, u yangi ilmiy g‘oyalar, farazlar va konsepsiyalarning shakllanishiga yordam beradi[24].

Talabalarning o‘quv faoliyatida xotira va tasavvur jarayonlari o‘zaro chambarchas bog‘liq holda namoyon bo‘ladi. Xotira orqali o‘zlashtirilgan bilimlar tasavvur jarayoni yordamida qayta ishlanadi va yangi g‘oyalar paydo bo‘ladi. Masalan, talaba ma’lum bir ilmiy nazariyani o‘rganish jarayonida avval uni xotirada saqlaydi, keyinchalik esa tasavvur yordamida ushbu bilimlarni yangi vaziyatlarda qo‘llash imkoniyatiga ega bo‘ladi.

A.N. Leontyevning ta’kidlashicha, insonning psixik jarayonlari faoliyat jarayoni bilan uzviy bog‘liq holda shakllanadi. Shu sababli xotira va tasavvur jarayonlarining rivojlanishi ham inson faoliyatining mazmuni va xarakteriga bog‘liqdir[25]. Talabalarning o‘quv faoliyati jarayonida xotira va tasavvur

[23] Zinchenko P.I. Neproizvolnaya pamyat. – Moskva: Pedagogika, 1961
[24] Vygotskiy L.S. Voobrazheniye i tvorchestvo v detskom vozraste. – Moskva: Pedagogika, 1991.
[25] Leontyev A.N. Deyatelnost. Soznaniye. Lichnost. – Moskva: Politizdat, 1975

jarayonlarini rivojlantirish uchun turli pedagogik usullardan foydalanish muhim ahamiyat kasb etadi.

Zamonaviy pedagogik-psixologik tadqiqotlar shuni ko‘rsatadiki, ta’lim jarayonida ko‘rgazmali vositalardan foydalanish, muammoli vaziyatlar yaratish, ijodiy topshiriqlar berish hamda interaktiv metodlarni qo‘llash talabalarning xotira va tasavvur jarayonlarini samarali rivojlantirishga yordam beradi. Bunday metodlar talabalarning bilish faolligini oshiradi, o‘rganilayotgan materialga nisbatan qiziqishini kuchaytiradi hamda bilimlarni mustahkam o‘zlashtirishga imkon yaratadi.

Shu bilan birga, talabalarning mustaqil ta’lim faoliyatini tashkil etish ham xotira va tasavvur jarayonlarining rivojlanishida muhim rol o‘ynaydi. Mustaqil ta’lim jarayonida talabalar turli ilmiy manbalarni o‘rganadi, o‘z fikrlarini tahlil qiladi va yangi g‘oyalar ishlab chiqishga harakat qiladi. Bu esa ularning xotira va tasavvur jarayonlarini yanada faollashtiradi hamda ilmiy tafakkurini rivojlantiradi. Shunday qilib, talabalarning o‘quv faoliyatida xotira va tasavvur jarayonlari muhim psixologik omillardan biri hisoblanadi. Ushbu jarayonlarning samarali rivojlanishi talabalarning bilimlarni chuqur o‘zlashtirishiga, mustaqil fikrlash qobiliyatining shakllanishiga hamda ijodiy salohiyatining rivojlanishiga xizmat qiladi.

XULOSA

Talabalarda xotira va tasavvur jarayonlari insonning bilish faoliyatida muhim o‘rin tutuvchi psixik jarayonlar hisoblanadi. Mazkur jarayonlar talabalarning o‘quv faoliyatida bilimlarni o‘zlashtirish, ularni saqlash, qayta tiklash hamda yangi bilim va g‘oyalarni shakllantirishda muhim ahamiyat kasb etadi. Shu sababli psixologiya fanida xotira va tasavvur jarayonlarining nazariy hamda metodologik asoslarini o‘rganish dolzarb ilmiy masalalardan biri sifatida qaraladi.

Psixologik adabiyotlar tahlili shuni ko‘rsatadiki, xotira insonning o‘z tajribasini saqlash va undan faoliyat jarayonida foydalanish imkonini beruvchi

murakkab psixik jarayon bo‘lib, uning samarali faoliyati eslab qolish, saqlash, qayta tiklash va unutish kabi jarayonlarning o‘zaro bog‘liqligiga asoslanadi. Talabalarning o‘quv faoliyatida ayniqsa so‘z-mantiqiy xotira muhim ahamiyat kasb etadi, chunki oliy ta’lim jarayonida beriladigan bilimlarning asosiy qismi nazariy tushunchalar va ilmiy qarashlardan iboratdir.

Shuningdek, tasavvur jarayoni ham talabalarning bilish faoliyatida muhim rol o‘ynaydi. Tasavvur insonning avvalgi tajribasi asosida yangi obrazlar yaratish qobiliyati bo‘lib, u ijodiy fikrlash va ilmiy faoliyatning psixologik asoslaridan biri hisoblanadi. Talabalarning ilmiy va ijodiy faoliyatida tasavvurning rivojlangan bo‘lishi yangi g‘oyalar va qarashlarning shakllanishiga xizmat qiladi.

Tadqiqotlar shuni ko‘rsatadiki, xotira va tasavvur jarayonlari o‘zaro uzviy bog‘liq bo‘lib, insonning bilish faoliyatida bir-birini to‘ldirib turadi. Xotira orqali o‘zlashtirilgan bilimlar tasavvur yordamida qayta ishlanadi va yangi bilimlar shakllanishiga zamin yaratadi. Shu sababli ta’lim jarayonida talabalarning xotira va tasavvur jarayonlarini rivojlantirishga qaratilgan pedagogik va psixologik usullardan samarali foydalanish muhim ahamiyatga ega.

Talabalarning bilimlarni o‘zlashtirish jarayonida xotira va tasavvur faoliyatining o‘zaro bog‘liqligi, ularning tafakkur va ijodiy fikrlashni rivojlantirishdagi roli yoritib beriladi. Tadqiqot natijalari talabalarning o‘quv jarayonida xotira va tasavvur jarayonlarini samarali rivojlantirish muhim pedagogik-psixologik omil ekanligini ko‘rsatadi.

Umuman olganda, talabalarda xotira va tasavvur jarayonlarining rivojlanganligi ularning o‘quv faoliyati samaradorligini oshirishda, mustaqil fikrlash qobiliyatini shakllantirishda hamda ijodiy salohiyatini rivojlantirishda muhim omil bo‘lib xizmat qiladi. Shu bois zamonaviy ta’lim jarayonida ushbu psixik jarayonlarni rivojlantirishga qaratilgan ilmiy asoslangan yondashuvlardan foydalanish dolzarb vazifalardan biri hisoblanadi.

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БЫТ И ТРАДИЦИИ АУЛА КАК ОСНОВА ХУДОЖЕСТВЕННОГО ПРОСТРАНСТВА В КАРАКАЛПАКСКОЙ ЛИТЕРАТУРЕ XX ВЕКА

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Annotatsiya: *Maqolada XX asr qoraqalpoq nasri va she'riyatida qishloq makonining poetikasi va semantikasi o'rganilgan. T.Qayipbergenov, J.Aymurzayev, I.Yusupovlarning asarlari asosida ovulning an'anaviy turmush tarzi, marosimlari va moddiy dunyosi shunchaki etnografik fon bo'lmay, ma'no hosil qiluvchi xronotopga aylanishi ko'rib chiqiladi. Muallif qoraqalpoq adabiyotida ovul olamning milliy manzarasining makon-zamon ekvivalenti sifatida namoyon bo'lishini isbotlaydi. Asarda ovul tasvirining evolyutsiyasi aks ettirilgan: 1920-1950-yillardagi ijtimoiy va mafkuraviy kelishmovchiliklar zonasidan asrimizning so'nggi uchdan bir qismida xotira va axloqiy yo'nalishning qadriyat oroligacha.*

Kalit so'zlar: *Qoraqalpoq adabiyoti, xronotop, qishloq hayoti, etnopoetika, To'lepbergen Qayipbergenov, folklor, milliylik, Ibroyim Yusupov.*

Аннотация: *В статье исследуется поэтика и семантика аульного пространства в каракалпакской прозе и поэзии XX столетия. На материале произведений Т. Кайыпбергенова, Ж. Аймурзаева и И.Юсупова рассматривается, каким образом традиционный быт, обрядовая практика и вещный мир аула перестают быть лишь этнографическим фоном и превращаются в смыслообразующий хронотоп. Автор доказывает, что аул в каракалпакской словесности выступает пространственно-временным эквивалентом национальной картины мира. В работе отслежена эволюция репрезентации аула: от зоны социального и идеологического разлома в 1920–1950-х годах до ценностного островка памяти и нравственного ориентира в последней трети века.*

Ключевые слова: *каракалпакская литература, хронотоп, быт аула, этнопоэтика, Толепберген Кайыпбергенов, фольклоризм, национальная идентичность, Ибрайым Юсупов.*

Abstract: *The article examines the poetics and semantics of rural space in 20th-century Karakalpak prose and poetry. Based on the works of T. Kaipbergenov, J. Aymurzaev, and I. Yusupov, it is considered how the traditional way of life, ritual practices, and the material world of the aul cease to be merely an ethnographic background and transform into a meaning-forming chronotope. The author proves that the aul in Karakalpak literature acts as a spatial-temporal equivalent of the national picture of the world. The work reflects the evolution of the representation of the aul: from a zone of social and ideological discord in the 1920s–1950s to a value island of memory and moral orientation in the last third of the century.*

Keywords: *Karakalpak literature, chronotope, village life, ethnopoetics, Tolepbergen Kayipbergenov, folklore, national identity, Ibrayim Yusupov.*

ВВЕДЕНИЕ

Проблема организации художественного пространства в литературах Центральной Азии XX века неразрывно связана с поиском форм национальной саморефлексии. Для каракалпакской литературоведческой традиции этот вопрос носит особый характер: младописьменный статус литературы, совпавший с бурными историческими трансформациями прошлого века, заставил авторов искать устойчивую смысловую опору. Таковой опорой — и пространственной, и ментальной — стал аул.

Восприятие аула как простого места действия давно исчерпало себя в науке. Когда мы открываем произведения Тлепбергенова Каипбергенова или Жолмурзы Аймурзаева, мы сталкиваемся с тем, что М. М. Бахтин называл «освоением реального исторического времени и пространства». Аул здесь — это замкнутый, но одновременно открытый в вечность микрокосм. Через устройство юрты, иерархию трапезы, ритм сезонных перекочевок вдоль Амударьи и звук кобыза каракалпакские писатели выстраивали собственную концепцию человека.

Цель настоящего исследования — проследить, как этнографическая реальность аульного быта трансформировалась в поэтический язык каракалпакской литературы XX века и как менялась семантика этого пространства под давлением исторических эпох.

МАТЕРИАЛЫ И МЕТОДЫ

Методология работы строится на стыке историко-литературного, структурно-семиотического и сравнительно-поэтического анализа.

Материалом исследования послужили романистика Т. Каипбергенова («Дочь Каракалпакии», трилогия «Дастан о каракалпаках»), проза Ж. Аймурзаева («Прощай, мама!»), а также поэтические циклы И. Юсупова.

В качестве теоретической базы используются фундаментальные труды М. М. Бахтина по теории хронотопа, а также работы ведущих исследователей восточных литератур и фольклора (М. К. Нурмухамедова, К. Мамбетова, П. Шермухамедова). Поэтика этнографической детали анализируется через призму семиотики культуры, где предметы материального быта трактуются как знаки культурного кода.

РЕЗУЛЬТАТЫ ИССЛЕДОВАНИЯ

Анализ художественных текстов показывает, что пространство аула в каракалпакской литературе XX века функционирует на нескольких взаимосвязанных уровнях, формируя целостную этнопоэтическую систему.

Архитектоника аульного хронотопа: от юрты к дельте

Семантика аульного пространства строится на строгой оппозиции внутреннего (своего, защищенного) и внешнего (чужого, стихийного) миров.

Центральной точкой этого пространства выступает *каракалпак уй* (традиционная юрта). В романах Т. Каипбергенова описание юрты никогда не бывает статичным: это сакральный центр. Пространство внутри юрты четко семантизировано:

- **Төр** (почетное место напротив входа) — зона аксакалов, гостей и хранения родовых реликвий. Оно символизирует связь с предками и преемственность традиции.

- **Очаг (ошак)** — энергетический и нравственный центр дома. Затухание или осквернение очага в сюжете всегда предвещает трагедию рода.

Выходя за пределы юрты, хронотоп аула расширяется до пределов дельты Амударьи и Приаралья. Но важнее другое: время внутри этого пространства течет циклически. Подчиняясь сельскохозяйственным работам, скотоводческому календарю и смене сезонов, сюжетика приобретает неторопливый, эпический характер, роднящий прозу с народными дастанами.

Вещный мир как инструмент психологизма

Каракалпакские прозаики XX века овеществляют переживания героев через детали быта. Предметная среда аула выполняет не декоративную, а психологическую функцию:

- **Костюмный код:** Описание *саукеле* (головного убора невесты) или *жегде* (накидки) в «Дочери Каракалпакии» — это не просто дань этнографии. Изменение деталей одежды маркирует социальный статус, взросление или внутренний надлом героини.
- **Ритуал дастархана:** Совместное чаепитие или подача традиционного бешбармака в текстах Ж. Аймурзаева выступают механизмом снятия социальных конфликтов. Отказ от угощения или нарушение этикета трапезы воспринимается персонажами как разрыв социальных связей.

Голос аула: фольклорно-обрядовая ткань

Аульное пространство в литературе невозможно представить в «тишине». Оно наполнено звучанием фольклорных жанров:

- **Исполнительская традиция:** Появление в ауле *жырау* или *баксы* меняет ход сюжетного времени. Звучание кобыза или дутара останавливает бытовую суету, перенося персонажей из повседневности в пространство исторической памяти.

- **Обрядовый фольклор:** Вплетение в ткань романа обрядовых песен — будь то свадебные плачи (*сыңсу*) или поминальные причитания (*жоқтау*) — позволяет авторам выходить от индивидуальной драмы конкретного героя к общенародному звучанию.

ОБСУЖДЕНИЕ

Сопоставление произведений разных десятилетий показывает, что образ аула в каракалпакской словесности не оставался застывшим. Он претерпел существенную эволюцию, отразившую сдвиги в самом национальном сознании.

1920–1950-е гг. 1960–1980-е гг.

Аул как объект социальных реформ --> Аул как субъект духовной памяти

(Конфликт старого и нового быта) (Оплот экологии и этики)

В литературе 1920–1950-х годов аул изображался через призму острого социального конфликта. Писатели ставили в центр сюжетной интриги слом патриархального уклада: раскрепощение женщин, ликвидацию безграмотности, борьбу с «родовыми пережитками». Аул в этот период показан как пространство, требующее обновления, хотя даже тогда в нем сохранялась эстетическая привлекательность народного быта.

Однако к 1960–1980-м годам (особенно в трилогии Т. Каипбергенова «Дастан о каракалпаках» и философской лирике И. Юсупова) вектор кардинально меняется. На фоне стремительной урбанизации и экологических проблем Аральского региона аул начинает восприниматься уже не как «отсталая окраина», а как главный источник нравственной чистоты, экологического равновесия и национальной самобытности. Он превращается в философему — место, где человек сохраняет гармонию с природой и историческими корнями.

Интересно сравнить эту тенденцию с деревенской прозой в русской литературе (В. Распутин, В. Белов) или казахским романом (М. Ауэзов, А.

Нурпеисов). Каипбергенов и его современники, по сути, решали ту же задачу: они спасали уходящий мир традиционной культуры, консервируя его в слове. Но каракалпакская специфичность проявилась в том, что аульный быт сохранил невероятно высокую степень органической связи с фольклорно-эпическим мышлением.

ВЫВОДЫ

1. Быт и традиции аула в каракалпакской литературе XX века представляют собой не внешнее обрамление сюжета, а структурообразующий фактор художественного пространства (хронотопа).

2. Предметно-вещный мир, топография юрты и семейно-бытовые ритуалы функционируют как сложно организованный язык, передающий психологическое состояние персонажей и этические ценности народа.

3. В течение XX века образ аула прошел путь от объекта социальной трансформации до статуса главного хранителя национальной картины мира, став для каракалпакской литературы экзистенциальной точкой отсчета.

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FORMATION OF THE JUDGE'S LEGAL AWARENESS IN THE CONDITIONS OF THE "E-COURT" SYSTEM: PSYCHOLOGICAL AND LEGAL ASPECTS

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Abstract. *Digitalization processes are radically changing the judicial system. This thesis studies the formation of the legal awareness of judges in the conditions of the national information system "E-Court". Both legal and psychological aspects of the problem are analyzed. The subject of the research is the impact of the electronic justice environment on the professional outlook, speed of decision-making and cognitive load of judges.*

Keywords: *E-court, judge, legal awareness, digitization, judicial and legal reforms, psychological factors, professional deformation, artificial intelligence, information technologies, justice.*

INTRODUCTION

The introduction of digital technologies is at the heart of modern judicial and legal reforms. In Uzbekistan, the "E-Court" system has accelerated document circulation and increased transparency [1]. However, technological transformation is not just a technical process. It directly affects the human factor, that is, the legal consciousness of the judge [7].

Legal consciousness is a system of understanding and reacting to legal existence. In the digital environment, it takes on a new appearance [3]. The transition from traditional paper-based proceedings to a digital format requires judges not only new knowledge, but also cognitive flexibility [2]. The relevance of this study is determined by the need to ensure the professional identification and psychological stability of a judge in the conditions of digital justice.

METHODS

The study used systematic analysis, comparative legal methods, and psychological monitoring methods. An anonymous survey was conducted among 40 judges of different instances using the "E-Court" system. The survey assessed cognitive load, information processing speed, and occupational stress levels while working with a digital interface. It also analyzed the legal deadlines for court decisions after the introduction of the electronic system.

RESULTS

The results of the study showed both positive and negative aspects of digitalization.

Legal aspects:

Time savings: The time for considering cases and issuing documents was reduced by an average of 35%.

Transparency: Automatic control of procedural deadlines strengthened discipline.

Speed to legal information: Integration with the legislative framework increased the quality of decisions.

Psychological aspects:

Cognitive load: 62% of judges noted increased eye and nervous fatigue due to the abundance of visual information.

Emotional intelligence: Due to the decrease in direct communication, it became difficult to determine the psychological state of the participants in the case (for example, perjury or emotional pressure) in a virtual environment (45% of respondents).

Technostress: Older judges (over 50 years old) were found to have a fear of system errors and difficulties in adapting.

DISCUSSION

The results obtained show that the "E-Court" system is creating a phenomenon of "digital transformation" in the legal consciousness of the judge

[4]. Legal consciousness is no longer limited to interpreting legal norms, but also includes the culture of working with algorithms and electronic data.

From a psychological point of view, the judge's internal confidence ("internal belief") in the administration of justice is changing [5]. The sense of psychological confidence that a signature and seal on a paper document give is being replaced by electronic digital signatures (EDS) and virtual registers. This can strengthen the formal-technical part of legal consciousness and weaken its humanistic and intuitive components.

Therefore, "E-Court" should remain only a technical tool, and not mechanize the judge's independent thinking and sense of justice [6]. Algorithms should help the judge, not replace him.

CONCLUSION

In the conditions of the "e-court" system, the judge's legal consciousness must consist of a synthesis of legal justice and digital competence. To overcome the problems, the following are proposed:

1. Introduction of "Digital Psychology and Technostress Management" modules into the advanced training courses for judges.

2. Improvement of the "e-court" interface in accordance with the cognitive and visual capabilities of judges (based on ergonomic design).

3. Legal guarantee of the inviolability of the judge's independent inner convictions when introducing elements of artificial intelligence.

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TURKISTON GENERAL – GUBERNATORLIGI DAVRIDA TIBBIYOT SOHASINING TASHKIL TOPISHI, RIVOJLANISHI VA ISLOHOTLARI

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Annotatsiya: *Ushbu maqolada Turkiston general-gubernatorligi davridagi tibbiyot sohasining tashkiliy tuzilishi, kadrlar tarkibi, moliyalashtirish tizimi hamda imperiya tomonidan o'lkada amalga oshirilgan tibbiy islohotlar tahlil qilingan. Tadqiqotda arxiv hujjatlari va zamonaviy tadqiqotchilarning ilmiy ishlari asosida mustamlaka davri tibbiyotining o'ziga xos xususiyatlari, uning harbiy va fuqarolik yo'nalishlari, shuningdek mahalliy aholiga tibbiy xizmat ko'rsatishdagi cheklovlar yoritilgan.*

Kalit so'zlar: *Turkiston general-gubernatorligi, mustamlaka tibbiyoti, akusher, feldsher, emlash, Kaufman, Girs, Chernyayev, sog'liqni saqlash tizimi, 1867-yil, 1868-yil, 1886-yil.*

Аннотация: *В данной статье анализируется организационная структура медицинской сферы, кадровый состав, система финансирования, а также медицинские реформы, проводившиеся империей в Туркестанском крае. На основе архивных документов и научных трудов современных исследователей раскрываются особенности колониальной медицины, её военное и гражданское направления, а также ограничения в оказании медицинской помощи местному населению.*

Ключевые слова: *Туркестанское генерал-губернаторство, колониальная медицина, акушер, фельдшер, прививка, Кауфман, Гирс, Черняев, система здравоохранения, 1867, 1868, 1886.*

Annotation: *This article analyzes the organizational structure, personnel composition, and financing system of the medical field, as well as the medical reforms implemented by the Empire in the Turkestan region. Based on archival documents and the scholarly works of modern researchers, the article reveals the peculiarities of colonial medicine, its military and civilian directions, and the limitations in providing medical care to the local population.*

Keywords: *Governorate-General of Turkestan, colonial medicine, obstetrician, paramedic, vaccination, Kaufman, Girs, Chernyayev, healthcare system, 1867, 1868, 1886.*

Turkiston o'lkasi Rossiya imperiyasi tomonidan mustamlakaga aylantirilgandan so'ng, boshqa ijtimoiy-iqtisodiy sohalar qatori sog'liqni saqlash tizimida ham tub o'zgarishlar amalga oshirila boshlandi. Mustamlakachilik siyosatining tarkibiy qismi sifatida shakllantirilgan yangi boshqaruv tizimi o'lkaning tabiiy-geografik va demografik xususiyatlarini hisobga olgan holda tashkil etilgan bo'lib, bu boshqaruvning muhim yo'nalishlaridan biri tibbiyot sohasi edi. Sog'liqni saqlash, o'rmon xo'jaligi, pochta-telegraf aloqasi kabi tarmoqlarda amalga oshirilgan islohotlar imperiya manfaatlariga moslashtirilgan bo'lsa-da, ular o'lkaning ijtimoiy hayotiga sezilarli ta'sir ko'rsatdi. Xususan, tibbiyot sohasidagi o'zgarishlar natijasida asrlar davomida shakllangan an'anaviy tabobat tizimiga qo'shimcha ravishda imperiya hududidan malakali tibbiyot xodimlari yuborila boshlandi. Dastlabki davrlarda imperiya tibbiyoti asosan harbiy qo'shinlarga xizmat ko'rsatgan bo'lsa, vaqt o'tishi bilan bu xizmat asta-sekin mahalliy aholiga ham yoyila bordi. Bu jarayonning borishini o'rganishda imperatorning maxfiy maslahatchisi Girsning taftish hisobotlari muhim manba bo'lib xizmat qiladi. Uning ma'lumotlariga ko'ra, 1867-yilgi Turkistonni boshqarish to'g'risidagi vaqtinchalik Nizom asosida dastlab Sirdaryo viloyatining har bir uyezdida bittadan shifokor va akusher tayinlangan, qo'shimcha shifokor va feldsherlarga ehtiyoj tug'ilganda esa hududda joylashgan harbiy gospitallarga murojaat qilingan [1, B.67].

Bu davrda viloyatdagi tibbiyot bo'limlari faoliyatini nazorat qilish viloyat harbiy shifokoriga topshirilgan bo'lib, unga tibbiyot inspektorining huquq va majburiyatlari berilgan edi. O'lkadagi butun tibbiyot bo'limiga rahbarlik qilish esa okrug harbiy tibbiyot inspektori zimmasiga yuklatilgan. Tadqiqotchi X.S.Jumanazarov bu boradagi qonunchilik asoslarini tahlil qilib, "Tibbiyotni boshqarish masalasi 1865-yilgi muvaqqat Nizomda va 1886-yilgi shaklida yoki Nizomga boshqa qo'shimchalar kiritilganda ham alohida tartiblanib, markaziy

va hududiy tuzilmalarning tarkibi qat'iy belgilangan", – deb ta'kidlaydi [2, B.23]. Bu fikr shuni ko'rsatadiki, mustamlaka ma'muriyati tibbiyot sohasini boshqarishga alohida e'tibor qaratgan va uni markazlashtirilgan tartibda tashkil etishga harakat qilgan.

Hududlarda tibbiy sohasi viloyat harbiy gubernatori nazoratida bo'lib, quyi boshqaruv tuman harbiy-tibbiy nozirida edi. Tuman harbiy-tibbiy noziri bir vaqtning o'zida Turkiston general-gubernatori va harbiy bo'lim bosh tibbiyot noziriga bo'ysungan. Tumanlar va viloyatning yirik shaharlarida nazorat okrug shifokorlari va o'rta tibbiyot xodimlariga yuklatildi. Keyinchalik, general-gubernator Toshkentning yangi shahar qismida rus aholisi sonining ko'payishi bilan bog'liq holda ikkinchi shahar akusheri lavozimini tashkil etdi. Bu holat mustamlaka ma'muriyatining tibbiy xizmatni, birinchi navbatda, o'lkaga ko'chib kelgan rus aholisi ehtiyojlariga moslab tashkil etganligidan dalolat beradi.

Turkiston general-gubernatorligi hududining kengayishi natijasida yangi bo'limlar tashkil etilgach, ularda ham Sirdaryo viloyatida bo'lgani kabi tibbiyot bo'limlari tuzilgan edi. Bu esa boshqaruv tizimining amaliyotda qanchalik unifikatsiyalashganini ko'rsatadi – yangi hududlarga ham xuddi shu model ko'chirilgan.

Turkistonda butun tibbiyot xodimlari o'lka rahbarining buyrug'i bilan quyidagicha tuzilgan edi: Sirdaryo viloyatining tarkibidagi uyezdlarda 7 ta shifokor, Toshkent shahrida 1 ta shifokor, viloyatning uyezdlarida 7 ta akusher, Toshkent shahrida 2 ta akusher, viloyatda hammasi bo'lib 8 ta feldsher, jami 25 nafar tibbiyot xodimi faoliyat ko'rsatgan. Farg'ona viloyatining uyezdlarida 6 ta shifokor, Yangi Marg'ilonda 1 ta shifokor, viloyatning uyezdlarida 6 ta akusher, Yangi Marg'ilonda 1 ta akusher, viloyatda hammasi bo'lib 8 ta feldsher, jami 21 nafar tibbiyot xodimi faoliyat ko'rsatgan.

Zarafshon okrugida esa 2 ta uyezd shifokori, 3 ta tarjimon, 1 ta Samarqand shahar shifoxonasi shifokori, 2 ta uyezd akusheri, 2 ta tibbiyot yordamchisi, 2 ta feldsher, jami 12 nafar tibbiyot xodimi faoliyat ko'rsatgan [3, B.430]. Turkiston

o'lkasi viloyatlarida faoliyat ko'rsatgan shifokorlar sonining bunday nomutanosibligi, birinchi navbatda, viloyatlardagi uyezdlar soni, hududning katta-kichikligi va aholi soniga bog'liq edi. Girs taftish hisobotlarida nafaqat tibbiyot xodimlari sonidagi farq, balki ularga berilayotgan maoshlarda ham farq borligini ko'rsatib o'tgan. Masalan, Sirdaryoda faoliyat olib borayotgan shifokorlarn ing har biri 1200 rubl maosh olgan bo'lsa, Farg'ona viloyatida bu ko'rsatkich 1500 rublni tashkil etgan. Bunday farq, ehtimol, hududlarning iqlim sharoiti og'irligi, aholi zichligi va viloyatlarning mustamlaka boshqaruvi uchun strategik ahamiyati bilan izohlanishi mumkin.

Turkistonni taftish qilgan Girs tibbiyot sohasiga sarflanayotgan mablag'lar va qo'shimcha xarajatlarni sinchkovlik bilan o'rgangan. Uning bergan ma'lumotlariga ko'ra, o'lka tibbiyot sohasidagi boshqaruv xarajatlari quyidagicha bo'lgan: 1) okrug harbiy tibbiyot inspektorining o'lka tibbiyot sohasini nazorat qilishi uchun 1000 rubl; 2) Amudaryo va Farg'ona viloyatlaridagi nazorat uchun har biriga 800 rubldan, jami 1600 rubl; 3) Zarafshon okrugi shifokorining xuddi shu vazifasi uchun 800 rubl; 4) mahalliy aholini davolash uchun Amudaryo bo'limining katta shifokoriga 600 rubl; 5) dori-darmonlarga 200 rubl; 6) tarjimonga 300 rubl mablag' sarflangan bo'lib, umumiy xarajatlar 4.500 rublni tashkil qilgan [1, B.51-52].

Bundan tashqari, o'lka tibbiyot sohasining xo'jalik masalalari uchun ham mablag'lar ajratilgan. Jumladan: 1) 18 ta shahar tez yordam xonasini ta'mirlash uchun 19.461 rubl; 2) Toshkent shahridagi ayollar ambulatoriyasi va Samarqanddagi kasalxonani ta'mirlash uchun 10.052 rubl; 3) Toshkent va Perovskiyda 2 ta deponi ta'mirlash uchun 1.000 rubl; 4) Farg'ona viloyatida chechakka qarshi 30 nafar kishini emlaganligi uchun 3.600 rubl (Turkiston o'lkasining qolgan qismlarida chechakka qarshi emlash xarajatlari aholidan olinadigan davlat yig'imlariga qo'shib hisoblangan); 5) Samarqand shahridagi dorixonani ta'mirlash va Kazalinskdagi dorixona uchun 7.120 rubl; 6) mahalliy aholi va to'lovga layoqatsiz shaxslarni davolash uchun 1.850 rubl sarflangan

bo'lib, xo'jalik masalalarining jami xarajatlari 107.518 rublni tashkil etgan. Bu xarajatlar davlat xazinasidan 52.800 rubl, zemstvo yig'imlaridan 46.058 rubl va shahar daromadlari hisobidan 8.620 rubl miqdorida qoplangan [3, B.430-431]. Moliyalashtirish manbalarining bunday xilma-xilligi – davlat xazinasi, zemstvo va shahar byudjetlarining birgalikda ishtirok etishi – mustamlaka ma'muriyatining markaziy byudjetga bo'lgan yukni kamaytirishga intilganligini ko'rsatadi.

XIX asrning ikkinchi yarmida Rossiya imperiyasining boshqa hududlarida bo'lgani kabi, Turkistonda ham chechak kasalligiga qarshi emlash ishlari davlat siyosatining muhim yo'nalishlaridan biriga aylandi. Yuqorida keltirilgan ma'lumotlardan ko'rinib turibdiki, emlash xarajatlari alohida moddda ko'rsatilgan va bu ishga davlat tomonidan mablag' ajratilgan. Biroq emlash kampaniyalarining ko'lami cheklangan bo'lib, ular asosan shahar aholisi va harbiy garnizonlar joylashgan hududlarni qamrab olgan. Aholining katta qismi, xususan ko'chmanchi va yarim ko'chmanchi turmush tarzini yuritgan tabaqalar, bunday tibbiy-profilaktik tadbirlardan deyarli chetda qolgan. Shu bilan birga, mustamlaka tibbiyoti mahalliy an'anaviy tabobat vakillari – tabiblar bilan raqobatga kirishgan bo'lsa-da, ularni to'liq siqib chiqara olmagan, chunki imperiya tibbiyot xodimlarining soni va infratuzilmasi butun o'lka aholisiga xizmat ko'rsatish uchun yetarli emas edi.

Tibbiy yordam xarajatlari ancha katta raqamlarni tashkil qilgani bilan, mintaqada tibbiy yordam yetarli bo'lmay, shifokorlar va o'rta tibbiyot xodimlarining faoliyati asosan aholi gavjum yashaydigan shaharlarga to'g'ri kelgan. Masalan, Toshkent, Yangi Marg'ilon va Samarqand shaharlarida bir nechta shifokorlar faoliyat ko'rsatgan bo'lsa, o'lkaning boshqa uyezdlarida butun uyezd bo'yicha bitta shifokor faoliyat olib borgan, xolos. Hududning kattaligi, aholi yashash joylarining bir-biridan uzoqda joylashganligi va mahalliy aholining katta qismi ko'chmanchi turmush tarzida istiqomat qilganligi tibbiy xizmatning barcha aholiga yetib borishiga to'sqinlik qilgan. Shu sababli,

mustamlakachilikning dastlabki yillarida faqat shaharlar yaqinida joylashgan aholi manzilgohlari tibbiy xizmatdan foydalana olgan, xolos. Bu holat, o'z navbatida, o'lka aholisining tibbiy madaniyati va davlat tibbiyotiga bo'lgan munosabatiga ham ta'sir ko'rsatgan – ko'pchilik aholi hamon an'anaviy davolash usullariga murojaat qilishni davom ettirgan.

Xulosa qilib aytganda, Turkiston general-gubernatorligi davrida shakllantirilgan tibbiyot tizimi, birinchi navbatda, mustamlaka ma'muriyati va harbiy qo'shinlar ehtiyojlarini qondirishga qaratilgan bo'lib, vaqt o'tishi bilan mahalliy aholiga ham tarqaldi. Tizimning markazlashtirilgan boshqaruv tuzilishi, kadrlar taqsimoti va moliyalashtirish manbalarining xilma-xilligi mustamlaka siyosatining o'ziga xos xususiyatlarini aks ettiradi. Shu bilan birga, tibbiy xizmatning cheklangan ko'lami, uning asosan shahar markazlariga qaratilganligi va aholining katta qismini qamrab ololmaganligi mustamlaka davri sog'liqni saqlash tizimining tub kamchiliklaridan biri bo'lib qoldi. Ushbu mavzuni yanada chuqur o'rganish, xususan arxiv hujjatlari asosida hududiy tahlillar o'tkazish, Turkiston tarixining ijtimoiy jihatlarini yanada to'liqroq yoritishga xizmat qiladi.

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SPECIAL MISSION IMMUNITIES BETWEEN TREATY AND CUSTOM: THE CASE FOR A NATIONAL CONSENT ARCHITECTURE IN UZBEKISTAN

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***Abstract**: This article examines the immunities of special diplomatic missions in states outside the 1969 Convention on Special Missions (CSM), which only thirty-nine states have joined. Drawing on English and German case law and the Council of Europe's CAHDI survey of state practice, it argues that receiving-state consent and executive certification, not treaty membership, determine immunity outcomes. It then examines Uzbekistan, an active practitioner of ad hoc diplomacy that has never engaged the CSM, and proposes a presidential-decree consent architecture grounded in Article 15 of the 2023 Constitution and Article 1(3) of Law LRU 692, modelled on the United Kingdom's 2013 certification process.*

***Keywords:** special missions; diplomatic immunity; customary international law; Convention on Special Missions 1969; executive certification; Uzbekistan; consent; ad hoc diplomacy.*

Temporary missions have become the principal instrument of contemporary diplomacy, and summit delegations, peace envoys, crisis-response teams, and technical commissions now generate more official cross-border activity than resident embassies. The legal regime governing them nonetheless remains unsettled. The 1961 Vienna Convention on Diplomatic Relations (VCDR) achieved near-universal participation with 193 parties, but its companion instrument, the 1969 Convention on Special Missions (CSM), has attracted only thirty-nine (United Nations Treaty Collection, 2026). No major power the United States, Russia, China, France, Germany, the United Kingdom,

India, or Japan is bound by it, and most bilateral relationships instead rely on customary international law as applied through domestic mechanisms.

This article argues, first, that treaty membership does not determine immunity outcomes: receiving-state consent and executive capacity to certify that consent do. Second, it applies this finding to Uzbekistan, a full party to the Vienna Conventions that has never engaged the CSM despite conducting one of Central Asia's most active ad hoc diplomatic programs. It proposes a domestic consent architecture, enacted by presidential decree under Article 15 of the 2023 Constitution and Article 1(3) of Law LRU 692 (2021), modelled on the United Kingdom's 2013 certification process.

The analysis is doctrinal and comparative. It examines the leading judicial statements on special mission immunity from the German Federal Court of Justice (Tabatabai, 1984) and the English courts (Khurts Bat, 2011; Freedom and Justice Party, 2018), read against the Council of Europe's CAHDI survey of state practice. Uzbekistan's constitutional and statutory framework is then assessed against this customary baseline, and its recent diplomatic practice is documented from official and press sources. Comparative certification mechanisms the United Kingdom's 2013 process, Finland's 1973 Act, and Belgium's invitation-based immunity provision inform the design of a proposed regulation, which is evaluated against four criteria: legal certainty, diplomatic reciprocity, administrative capacity, and accountability safeguards.

CSM Article 1 defines a special mission by temporariness, state representation, task specificity, and receiving-state consent (Convention on Special Missions, 1969). Its regime personal inviolability (art. 29), absolute criminal immunity (art. 31), and civil immunity subject to four exceptions (art. 31) closely follows the VCDR. The United Kingdom, which signed but never ratified the CSM, attributed its non-ratification to the breadth of these automatic immunities (United Kingdom, 2019). The practical result is that the treaty

governs under four percent of possible bilateral pairings, and no major-power relationship.

Three decisions define the customary core. *Tabatabai* (1984) held that an ad hoc envoy may receive immunity by individual agreement with the receiving state, and that consent could be given retroactively. *Khurts* Bat (2011) held that customary immunity is conditional on the receiving state's prior consent; the Foreign and Commonwealth Office's denial that consent had been given was determinative, and the individual was extradited. Freedom and Justice Party confirmed a customary obligation to secure inviolability and criminal immunity for consented mission members personal rather than functional, admitting no exception even for torture allegations.

As Wood observed, the customary rules are simultaneously wider and narrower than the treaty: wider, because every accepted mission member is protected regardless of rank, and narrower, because custom has not been shown to extend to full civil immunity, fiscal privileges, or the Convention's waiver mechanics, with several CAHDI respondents confining civil immunity to acts that would impede the mission's functions.

In the United Kingdom, custom is received automatically into domestic law, and the courts have assigned the consent question to the executive. Following Khurts Bat, the Foreign Secretary announced a 2013 pilot process letting embassies seek advance consent to special mission status; the Foreign and Commonwealth Office's answer is treated as conclusive on the fact of consent, while courts retain authority over the legal consequences .

Uzbekistan acceded to the VCDR and VCCR without reservation on 2 March 1992, the day of its UN admission, but has never engaged the CSM; no succession argument is available, since the Soviet Union never signed it. Of the thirty-nine CSM parties, only a handful figure in Uzbekistan's bilateral diplomacy, while its principal partners Russia, China, the United States, Germany, Turkey, and the Gulf states remain outside the treaty. Since 2017,

Uzbekistan has hosted the 2022 SCO Samarkand summit, the 2018 and 2022 Tashkent Afghanistan conferences, repeated Taliban delegations, and the Central Asian Heads of State Consultative Meetings, all conducted without a domestic legal instrument governing mission members' status.

Article 15 of the 2023 Constitution gives international treaties and customary international law force within, and priority over, domestic legislation, so the customary special mission rule is already notionally part of Uzbek law. Article 1 of Law LRU 2021 anticipates domestic instruments conferring immunity, but none exists; visiting delegations are managed through unpublished Ministry of Foreign Affairs practice, leaving Uzbekistan exposed to a Khurts Bat-type scenario.

Three reform paths exist. Accession to the CSM with implementing legislation is the soundest long-term option but would require eighteen to thirty months under the Law on International Treaties, cover only a small share of Uzbekistan’s mission traffic, and leave the immediate gap open. Continuing ad hoc practice fails the elementary requirement of legal certainty, leaving public authority, in Nollkaemper’s (2011) terms, neither conferred nor controlled by law.

The preferable option is a standalone regulation by presidential decree, implementable within six to twelve months on the existing constitutional and statutory basis, modelled on the United Kingdom’s process, Finland’s 1973 Act, and Belgium’s invitation-based provision. Its five elements: the Ministry of Foreign Affairs as sole consent authority; seventy-two-hour advance notification of members, dates, and agenda; a certificate of special mission status, conclusive on a mission’s existence and membership while leaving courts authority over whether specific acts fall within its certified functions; verbatim codification of the CSM’s four civil-immunity exceptions; and an express waiver mechanism, including an optional advance waiver for international crimes responding to the

accountability gap in Freedom and Justice Party (2018) and anticipating the International Law Commission's (2022) draft articles on official immunity.

Measured against the four evaluation criteria, this architecture offers greater legal certainty than current practice, preserves reciprocity by tracking the treaty standard without requiring ratification, is administratively realistic given existing Ministry capacity, and builds in accountability absent from ad hoc diplomacy.

The CSM succeeded as a codification but failed as a treaty: the states most in need of it have declined to join. What has emerged instead is a customary regime whose firm core inviolability and criminal immunity for consented mission members operates everywhere through executive certification of consent. For Uzbekistan, a state whose diplomatic ambition has outpaced its legal infrastructure, the constitutional and statutory foundations already exist. A single presidential decree could close the gap within a year, while accession to the Convention remains open for consideration on its own merits.

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EMOTSIYALAR - INSON ONGINING MOTIVATSION ASOSI

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Annotatsiya. *Mazkur maqolada emotsiyalarning inson ongining motivatsion asosi sifatidagi o‘rni va ahamiyati tahlil qilinadi. Emotsiyalarning bilish jarayonlari, motivatsiya, xotira, diqqat, qaror qabul qilish hamda inson xulq-atvorini boshqarishdagi roli yoritiladi. Shuningdek, emotsiyalarning psixologik, kognitiv va lingvistik jihatlari hamda ularni tadqiq etishga doir asosiy nazariy yondashuvlar ko‘rib chiqiladi. Maqolada emotsiyalar insonning ichki ehtiyojlari va tashqi faoliyati o‘rtasidagi bog‘lovchi mexanizm sifatida baholanib, ularning shaxsning moslashuvi, muloqoti va ijtimoiy faoliyatini tartibga solishdagi ahamiyati asoslab beriladi. Tadqiqot natijalari emotsiyalarning inson tafakkuri va ongli faoliyatining ajralmas tarkibiy qismi ekanligini hamda motivatsion jarayonlarning samarali kechishida muhim omil bo‘lib xizmat qilishini ko‘rsatadi.*

Kalit so‘zlar: *biologik instinkt, mental faoliyat, emotsional tafakkur, motivatsion tizim, milliy-madaniy me’yor, ong muammosi, psixologlar va fiziologlar emotsiya, emotsional-kognitiv tuzilma.*

Аннотация. *В данной статье анализируются роль и значение эмоций как мотивационной основы человеческого сознания. Рассматривается влияние эмоций на познавательные процессы, мотивацию, память, внимание, принятие решений, а также на регуляцию поведения человека. Особое внимание уделяется психологическим, когнитивным и лингвистическим аспектам эмоций, а также основным теоретическим подходам к их изучению. В статье эмоции рассматриваются как связующий механизм между внутренними потребностями человека и его внешней деятельностью, обосновывается их значимость в процессе адаптации личности, коммуникации и регулирования социальной активности. Результаты исследования свидетельствуют о том, что эмоции являются неотъемлемой составляющей человеческого мышления и сознательной деятельности, а также выступают важным фактором, обеспечивающим эффективное протекание мотивационных процессов.*

Ключевые слова: *биологический инстинкт, ментальная деятельность, эмоциональное мышление, мотивационная система, национально-культурная норма, проблема сознания, психологи и физиологи, эмоция, эмоционально-когнитивная структура.*

Abstract. *This article analyzes the role and significance of emotions as the motivational foundation of human consciousness. It examines the influence of emotions on cognitive processes, motivation, memory, attention, decision-making, and the regulation of human behavior. Particular attention is paid to the psychological, cognitive, and linguistic aspects of emotions, as well as to the major theoretical approaches to their study. The article considers emotions as a connecting mechanism between an individual's internal needs and external activities, substantiating their importance in personal adaptation, communication, and the regulation of social behavior. The findings indicate that emotions are an integral component of human thinking and conscious activity, serving as a key factor in ensuring the effective functioning of motivational processes.*

Key words: *biological instinct, mental activity, emotional thinking, motivational system, national-cultural norm, the problem of consciousness, psychologists and physiologists, emotion, emotional-cognitive structure.*

Til o‘ziga xos biologik instinkt sifatida inson emotsiyalari bilan uzviy bog‘liq. Emotsiyalar ham biologik instinktlarning muhim ko‘rinishlaridan biri hisoblanadi. Ilm-fanda ong va tafakkurning birligi haqidagi mulohaza umumiy e’tirof etilgan bo‘lib, unga ko‘ra, fikrlash qobiliyatiga ega bo‘lgan har qanday mavjudot ongga ham ega bo‘ladi. Biroq emotsiyalarni o‘rganish ularning bevosita kuzatib bo‘lmaydigan tabiati, shuningdek, ushbu tushuncha hamda uning predmetga ega bo‘lmagan shaklini til vositasida to‘liq ifodalashning murakkabligi sababli maxsus ilmiy yondashuvlarni talab etadi.

Ma’lumki, ong moddiy shaklga ega bo‘lmagan soha bo‘lib, u miyaning faqat mental (aqliy) faoliyatini ifodalaydi. Bugungi kunda emotsiyalar insonning mental faoliyati bilan chambarchas bog‘liqligi ilmiy jihatdan isbotlangan. Emotsiyalar aqliy jarayonlarga hamrohlik qilishi, ularni qo‘zg‘atishi, faollashtirishi, to‘xtatishi yoki ularning natijalarini baholashi mumkin. Shu bois zamonaviy ilm-fanda emotsional ong, emotsional tafakkur, emotsional miya

hamda emotsional tafakkur tushunchalari keng qo‘llaniladi [Хомская, Батова, 1998].

Til ongning o‘n beshta modulidan biri sifatida qaraladi va ushbu modullar qatoriga emotsiyalar ham kiradi. Tilning biologik konsepsiyasiga ko‘ra, til tug‘ma instinkt hisoblanar ekan, demak, ong ham, emotsiyalar ham tashqi olamga nisbatan yuzaga keladigan reflekslar emas, balki tug‘ma instinktlardir. Shunday ekan, emotsiya ayrim faylasuflar, jumladan G. X. Shingarov, S. Pinker va boshqalar ta’kidlaganidek, borliqni aks ettirish shakli emas, balki ong, tafakkur va nutqiy xulq-atvorning motivatsion tizimi sifatida namoyon bo‘ladi.

Mazkur tizimning faoliyati esa har bir xalqning milliy-madaniy me’yorlari va qadriyatlari ta’sirida shakllanadi. L. Vitgenshteyn konsepsiyasiga ko‘ra, til tafakkurni “kiyintiradi”, ya’ni uni til shakliga soladi. Tafakkur esa voqelikdagi muayyan vaziyatning tasviri bo‘lib, u mumkin bo‘lgan vaziyatlar majmuasidan iborat. Ushbu vaziyatlarning tafakkurda aks etishi doimo subyektiv xarakterga ega bo‘lib, shaxsning individual manfaatdorligi orqali amalga oshadi. Shu sababli barcha tafakkur manzaralari yuzaki yoki chuqur darajada bo‘lsada, o‘z mohiyatiga ko‘ra emotsional xususiyat kasb etadi.

Inson fikrini alohida so‘zlar, ularning kombinatsiyalari yoki matnlar orqali emas, balki tafakkur vositasida ifodalaydi. Shuning uchun ham nutqiy xulq-atvor, ong va tafakkur voqelikdagi vaziyatlar hamda faktlarni baholash jarayoni bilan boshqariladi, bu baholash esa har doim emotsional xarakterga ega bo‘ladi. Shu ma’noda emotsiyalar nafaqat muayyan kommunikativ vaziyatlar ta’sirida yuzaga keladi va faollashadi, balki o‘z navbatida yangi-yangi kommunikativ vaziyatlarning vujudga kelishiga ham sabab bo‘ladi. Demak, til insonning olamga moslashuvi, axborotni uzatishi va muloqot jarayonida voqelikni aks ettirishi uchun xizmat qiladigan biologik mexanizm hisoblanadi. Bunday muloqot esa doimo emotsional motivatsiya asosida amalga oshadi.

Ong muammosi mahalliy tilshunoslikda qariyb ikki asrdan buyon asosan Aleksey Nikolayevich Leontyev tomonidan ilgari surilgan faoliyatga asoslangan yondashuv metodologiyasi asosida tadqiq etib kelinmoqda [Леонтьев, 1975].

Mazkur yondashuvga ko‘ra, ong inson faoliyati jarayonida shakllanadi va rivojlanadi. Ko‘plab ilmiy tadqiqotlar tahlili shuni ko‘rsatadiki, psixolingvistlar hanuzgacha til va ongning birligi haqidagi nazariyadan chetga chiqa olmayaptilar. Ular ongni asosan til orqali talqin etadilar hamda til, xususan, uning asosiy vositasi bo‘lgan so‘z ongni vositali tarzda ifodalaydi, degan qarashga tayanadilar. Bugungi kunda ongni o‘rganishning eng samarali yo‘li til birliklaridagi ma’no va mazmun tuzilishini ochib berishdan iborat, degan xulosa deyarli aksioma sifatida qabul qilingan. Chunki ushbu yondashuvga ko‘ra, ongning asosiy determinantlari belgi va ma’no tizimlaridir [Уфимцева, 2000].

Psixologlar va fiziologlar emotsiyalar inson tafakkurining ajralmas tarkibiy qismi ekanligini ishonchli ilmiy dalillar bilan asoslaydilar. Emotsiyalarning kognitiv nazariyasiga ko‘ra, emotsiyalar aqlning funksiyalaridan biri sifatida qaraladi [Izard, 1980]. Ular nafaqat kognitiv jarayonlardan oldin yuzaga keladi, balki ushbu jarayonlarning kechishini ham kuzatib boradi va ularga hamrohlik qiladi [Шаховский, 2001].

Xorijiy tadqiqotchilar barcha bilish jarayonlari emotsiyalar orqali amalga oshishini ta’kidlaydilar. Ularning fikricha, emotsiyalar kognitiv elementlarni birlashtirib, ularni emotsional-kognitiv tuzilma sifatida tashkil etadi. Ushbu jarayonning iyerarxik darajalarda takrorlanishi va rivojlanishi esa inson tafakkurining taraqqiyotini ta’minlaydi [Grey, 1973].

Carroll Izard emotsiyalar inson fikrlarini determinatsiya qiladi, ya’ni ularning shakllanishi va rivojlanishini belgilaydi, degan fikrni ilgari suradi [Izard, 1980].

Roger Brown hamda undan keyingi ko‘plab olimlarning eksperimental tadqiqotlari shuni ko‘rsatadiki, inson har qanday nutqiy ifodadagi predmet-

mantiqiy axborotni anglashdan avval uning emotsional-baholovchi komponentini idrok etadi.

Alfred Binetning qayd etishicha fikr dastlab emotsional obraz shaklida vujudga keladi va faqat shundan keyingina nutqiy ifodaga ega bo‘ladi.. Garchi A. Binet tilshunos bo‘lmagan bo‘lsa-da, Charles Bally bu g‘oyani yanada rivojlantirib, quyidagi “Biz hech qachon mutlaqo ratsional tarzda na fikrlaymiz, na so‘zlaymiz” mashhur fikrni ilgari suradi [Балли, 1961].

Ichki psixologik va fiziologik jarayonlarning bunday tashqi ifodalanishi ularning eng muhim belgilaridan biri hisoblanadi. Bundan tashqari, emotsiyalar bilan bog‘liq yana ko‘plab dalillar mavjud. Jumladan, emotsional jihatdan bo‘yalgan axborot emotsional neytral axborotga nisbatan tezroq va mustahkamroq esda saqlanishi ilmiy jihatdan isbotlangan. Shuningdek, insonda emotsional xotira mavjudligi ham aniqlangan. Emotsional xotira deganda inson ilgari boshdan kechirgan emotsional kechinmalarning xotirada qayta jonlanishi, ya’ni emotsional tajribaning bir vaziyatdan ikkinchi vaziyatga ko‘chirilishi tushuniladi. Tabiiyki, bunday ko‘chirish jarayoni inson hayoti davomida ko‘p marotaba takrorlanadi va to‘plangan emotsional tajriba uning lisoniy ongida mustahkamlanib boradi.

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MYTHOPOETIC REPRESENTATION IN THE CHILDREN'S FICTION OF KHUDOYBERDI TUKHTABOYEV AND SUSAN HILL.

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Abstract:*Mythopoetic representation enriches children's literature by transforming folklore, myths, and symbolic imagination into meaningful narratives. This paper compares Khudoyberdi Tukhtaboyev's* Riding the Yellow Giant *and Susan Hill's* I'm the King of the Castle *to explore how mythopoetic elements reflect childhood, cultural identity, and moral values. Using qualitative comparative literary analysis and mythopoetic criticism, it examines the role of symbolism, narrative structure, and cultural context in both novels. The analysis reveals that Tukhtaboyev draws primarily on Uzbek folklore, whereas Hill employs Gothic symbolism and psychological imagery to portray children's emotional experiences. Despite these differences, both authors use mythopoetic representation to illuminate imagination, identity, and personal development. The paper contributes to comparative children's literature by highlighting both universal and culture-specific dimensions of mythopoetic representation.*

Keywords: *mythopoetics; children's literature; comparative literature; folklore; symbolism; Gothic imagery.*

INTRODUCTION:

Mythopoetic representation is an important aspect of children's literature, transforming myths, folklore, and symbolic imagination into meaningful literary narratives. Through mythopoetic elements, writers explore children's emotional experiences, cultural identity, and moral development while enriching the artistic value of their works.[4,28]

Uzbek and English children’s literature employ different approaches to mythopoetic representation. Uzbek writers often draw on folklore and oral traditions, whereas English authors frequently use symbolism and Gothic

imagery to depict children's inner worlds[5,214]. Despite these differences, both traditions demonstrate the significance of mythopoetic imagination in portraying childhood.

Although folklore in Uzbek children's literature and Gothic symbolism in English fiction have been widely discussed, comparative research on mythopoetic representation remains limited. To address this gap, the present paper compares Khudoyberdi Tukhtaboyev's *Riding the Yellow Giant* and Susan Hill's *I'm the King of the Castle*. It examines how mythopoetic elements are employed to represent childhood, cultural values, and psychological development, highlighting both universal and culture-specific features of mythopoetic representation in children's literature.

MATERIALS AND METHODS

A qualitative research design based on comparative literary analysis was employed to examine mythopoetic representation in Khudoyberdi Tukhtaboyev's *Riding the Yellow Giant* and Susan Hill's *I'm the King of the Castle*. The two novels were selected because they represent different literary traditions while portraying childhood through symbolic imagination and culturally significant narratives. The analysis integrates three complementary approaches: comparative literary analysis to identify similarities and differences between the texts, mythopoetic analysis based on the theories of Campbell, Jung, and Eliade to interpret archetypal images and symbolic motifs, and close reading to examine characterization, setting, symbolism, and narrative structure.[7,256]

The comparison is organized around four analytical categories: *mythopoetic origin, symbolic function, narrative role, and cultural significance***.** These criteria provide a systematic framework for exploring both universal and culture-specific aspects of mythopoetic representation in Uzbek and English children's literature.

RESULTS AND DISCUSSION:

The comparative analysis demonstrates that both novels employ mythopoetic representation to deepen the artistic portrayal of childhood. However, the sources and functions of mythopoetic imagery differ considerably because of their distinct literary and cultural traditions.

In *Riding the Yellow Giant*, mythopoetic representation is primarily rooted in Uzbek folklore. The image of the Yellow Giant is not merely a fantastic creature but a symbolic figure that reflects children's imagination, courage, and aspiration to overcome everyday difficulties.[9,38] Through this folkloric image, Tukhtaboyev transforms traditional oral narratives into a modern children's story in which fantasy becomes a means of personal growth rather than simple entertainment. The giant symbolizes the limitless potential of imagination while simultaneously reflecting cultural values such as honesty, perseverance, and kindness.[9,75] Consequently, mythopoetic imagery functions as both an artistic and educational device.

Unlike Tukhtaboyev's explicit use of folkloric imagination, Susan Hill constructs mythopoetic representation through symbolic settings and psychological perception. *I'm the King of the Castle* contains no literal supernatural beings; instead, places and objects gradually acquire mythopoetic significance through the protagonists' emotional experiences.[3,321] Hang Wood, for example, functions as a symbolic space where fear, uncertainty, and loneliness become tangible. Similarly, the scarecrow and the recurring images of darkness operate as symbolic manifestations of childhood anxiety rather than supernatural entities. Hill therefore transforms ordinary reality into a psychologically charged symbolic landscape that reflects the children's inner conflicts.

This difference illustrates two distinct artistic models of mythopoetic representation. Tukhtaboyev externalizes myth through folkloric imagination and recognizable mythical imagery,[9.135] whereas Hill internalizes myth by embedding symbolic meaning within psychological experience and Gothic

atmosphere.[3,89] Despite employing different narrative strategies, both authors demonstrate that mythopoetic representation extends beyond mythology itself and serves as a literary mechanism for interpreting childhood.

The comparison also reveals important similarities. In both novels, mythopoetic representation functions as a bridge between reality and imagination. The protagonists confront emotional challenges through symbolic experiences that enable them to negotiate fear, uncertainty, and personal identity. Rather than presenting fantasy as an escape from reality, both writers integrate symbolic imagination into children's everyday lives, allowing psychological growth to emerge through encounters with mythopoetic imagery.[11,56]

From a cultural perspective, the two novels reflect different conceptions of childhood. Tukhtaboyev emphasizes collective values inherited from Uzbek folklore, where imagination strengthens children’s relationship with family, community, and cultural traditions. Hill, by contrast, focuses on individual psychological development, portraying childhood as a period of emotional vulnerability and identity formation. Nevertheless, both literary traditions acknowledge imagination as an essential component of children’s cognitive and emotional development.

CONCLUSION

The comparative analysis of Khudoyberdi Tukhtaboyev’s *Riding the Yellow Giant* and Susan Hill’s *I'm the King of the Castle* demonstrates that mythopoetic representation plays a vital role in portraying childhood across different cultural traditions. While Tukhtaboyev draws on Uzbek folklore and fantasy, Hill employs Gothic symbolism and psychological imagery to explore children's emotional experiences. Despite these differences, both authors use mythopoetic elements to address identity, imagination, and moral development. The comparison highlights both universal and culture-specific aspects of mythopoetics, showing that symbolic representation serves as an effective means of interpreting childhood. These findings contribute to comparative children's

literature and provide a foundation for future research on mythopoetics across diverse literary traditions and cultural contexts.

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ПСИХОЛОГИЧЕСКИЕ ДЕТЕРМИНАНТЫ ПРОФЕССИОНАЛЬНОГО САМООПРЕДЕЛЕНИЯ В УСЛОВИЯХ ТРАНСФОРМАЦИИ МИРА ПРОФЕССИЙ ЦИФРОВОЙ ЭПОХИ

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Аннотация. *В статье представлен теоретический анализ психологических детерминант профессионального самоопределения личности в условиях кардинальной трансформации мира профессий, обусловленной процессами цифровизации, автоматизации и внедрения систем искусственного интеллекта. Обосновывается положение о трансформации профессионального самоопределения из единовременного акта выбора в процесс непрерывного проектирования карьерной траектории. Предлагается авторская концепция «цифровой профессиональной идентичности» как интегративного психологического образования, обеспечивающего устойчивость личности в условиях высокой неопределенности рынка труда.*

Ключевые слова: *профессиональное самоопределение, цифровая трансформация, цифровая экономика, рынок труда, психологические детерминанты, soft skills, VUCA-мир, цифровая самоэффективность, карьерная траектория, цифровая профессиональная идентичность, психологическая устойчивость.*

Abstract. *This article presents a theoretical analysis of the psychological determinants of professional self-determination in the context of the profound transformation of the world of work driven by digitalization, automation, and the implementation of artificial intelligence systems. It substantiates the view that professional self-determination is evolving from a one-time career choice into a continuous process of designing and managing an individual career trajectory. The paper introduces the author's concept of digital professional identity as an integrative psychological construct that enables individuals to maintain resilience under conditions of high uncertainty in the labor market.*

Keywords: *professional self-determination, digital transformation, digital economy, labor market, psychological determinants, soft skills, VUCA world, digital self-efficacy, career trajectory, digital professional identity, psychological resilience.*

ВВЕДЕНИЕ

Цифровая трансформация, пронизывающая все сферы жизнедеятельности современного общества, инициирует глубинные изменения в социально-экономических укладах, детерминируя кардинальную трансформацию рынка труда и, как следствие, мира профессий. Ускорение научно-технического прогресса, внедрение систем искусственного интеллекта, повсеместная автоматизация и роботизация производственных процессов формируют принципиально новую реальность профессиональной занятости.

Согласно прогнозам Всемирного экономического форума, к 2030 году около 22% существующих рабочих мест претерпят значительные изменения: 14% профессий будут созданы заново, а 8% — полностью исчезнут [4, с. 9]. Это создает беспрецедентные вызовы для системы профессиональной ориентации и психологического сопровождения профессионального становления личности. А также в исследованиях Международной организации труда, отмечается, что около четверти всех работников в мире заняты в профессиях, подверженных влиянию автоматизации на базе генеративного ИИ, при этом под полным риском замещения находится лишь около 2.3% рабочих мест [2, с. 8; 1]. Это создает беспрецедентные вызовы для системы профессиональной ориентации и психологического сопровождения профессионального становления личности.

Актуальность настоящего исследования определяется необходимостью выявления психологических механизмов и детерминант, обеспечивающих успешную профессиональную самореализацию личности в условиях нарастающей неопределенности и высокой динамики изменений.

Теоретико-методологической базой настоящей работы выступают фундаментальные положения психологии труда и профессионального самоопределения, разработанные в российской и зарубежной науке. Исследование опирается на системно-деятельностный подход, рассматривающий профессиональное самоопределение как многоуровневый процесс личностного и социального становления; субъектно-деятельностную парадигму, акцентирующую активную роль личности в построении собственной профессиональной траектории; а также на современные концепции цифровой социализации и VUCA-подход, описывающие особенности развития личности в условиях нестабильности, неопределенности, сложности и неоднозначности. Методологически значимым является также положение о гибридной социализации, сочетающей воздействие реальной и виртуальной среды, что находит отражение в работах С.В. Пазухиной и А.С. Миронова [8, с. 121–122].

ОСНОВНАЯ ЧАСТЬ

В условиях цифровой экономики профессиональное самоопределение утрачивает характер единовременного акта выбора и трансформируется в процесс непрерывного проектирования индивидуальной карьерной траектории. Данные процессы существенно видоизменяют структуру занятости, типы работ, требования к квалификации и формы трудовых отношений. Цифровая экономика испытывает возрастающую потребность в специалистах, обладающих не только техническими компетенциями, но и развитыми креативными и критическими способностями, владеющих цифровой грамотностью и навыками эффективного сотрудничества [6, с. 414].

С.В. Пазухиной и А.С. Миронова отмечают, что специфика гибридной социализации современных школьников, сочетающей воздействие реальной и виртуальной среды, нередко приводит к

искажению их представлений о собственных способностях, что затрудняет процесс личностного и профессионального самоопределения. Одним из главных факторов, обусловливающих проблемы профессионального выбора, является несформированность у детей цифрового поколения соответствующей мотивации и ограниченность знаний, касающихся современных профессий [8, с. 121-122]. В этой связи особую значимость приобретает формирование ценностно-мотивационных установок, соответствующих требованиям цифровой экономики [8, с. 134].

В условиях VUCA-мира особую значимость приобретают психологические качества, обеспечивающие адаптивность и устойчивость личности. Как показывает анализ современных исследований, «для выживания в VUCA-мире человеку необходимы такие личностные качества, как скорость, динамизм, способность постоянно меняться, умение адаптироваться, стремление постоянно приобретать новые знания» [7, с. 30]. Эти качества, составляющие основу «soft skills» (гибких навыков), становятся критически важными детерминантами успешного профессионального самоопределения.

Эмпирические исследования показывают, что такие компоненты «мягких навыков», как обучаемость, креативность, способность к активным социальным контактам и саморазвитие, способны оказывать позитивное влияние на карьерные предпочтения студентов, существенно облегчая их профессиональное самоопределение в условиях цифровой социализации. В этой связи особое значение приобретает формирование ценностно-мотивационных установок, соответствующих указанным выше навыкам, как жизненно важных для успешного существования молодых людей в современном мире [7, с. 32-33].

Значимым предиктором профессионального выбора выступает цифровая самоэффективность. Исследования, проведенные Т. Чжао с коллегами, демонстрируют, что цифровая самоэффективность и интерес к

цифровым технологиям существенно предсказывают выбор студентами цифровой карьеры, при этом интерес выступает более сильным предиктором. Установлено, что студенты четырехлетних университетов с большей вероятностью выбирают цифровую карьеру по сравнению со своими сверстниками из высших профессиональных колледжей. При этом повышение цифровой самоэффективности студентов профессиональных колледжей может оказывать разнонаправленное влияние на предпочтения в различных цифровых областях [5, с. 118–144]. Эти данные подчеркивают необходимость развития у обучающихся не только технических компетенций, но и внутренней мотивации к деятельности в цифровой среде.

В рамках настоящего исследования предлагается авторская концепция «цифровой профессиональной идентичности» как интегративного психологического образования, обеспечивающего устойчивость личности в условиях высокой неопределенности рынка труда. Под цифровой профессиональной идентичностью понимается динамическая система представлений личности о себе как о субъекте профессиональной деятельности в цифровой среде, включающая когнитивный (знания о цифровых профессиях и требованиях к ним), эмоционально-ценностный (отношение к цифровой деятельности, мотивация) и поведенческий (готовность к действиям в цифровой профессиональной среде) компоненты.

Уникальность предлагаемой концепции заключается в том, что цифровая профессиональная идентичность рассматривается не как статичное образование, а как процесс непрерывного конструирования и реконструирования, что соответствует динамической природе современного рынка труда. В отличие от традиционной профессиональной идентичности, формирующейся в относительно стабильных социально-экономических условиях, цифровая профессиональная идентичность

требует от личности качественно иного уровня рефлексии, гибкости и готовности к переобучению. Данная концепция позволяет объяснить феномен успешной профессиональной самореализации в условиях, когда профессия может многократно трансформироваться в течение одного поколения.

Современные подходы к профориентации претерпевают существенную эволюцию — от разовых мероприятий к системному адаптивному сопровождению карьеры, учитывающему динамику компетенций и личных интересов в условиях цифровой экономики [3]. В этой парадигме профессиональное самоопределение понимается как процесс непрерывного конструирования и реконструирования карьерной траектории, требующий от личности развитой рефлексии, гибкости и готовности к обучению на протяжении всей жизни.

Особый интерес представляет концепция, в которой данные и аналитика не подменяют человека, а поддерживают осознанные решения, объединяя цифровые инструменты, психологическое сопровождение и этические принципы работы с данными. Это позволяет выстраивать системы поддержки выбора, в которых технологии усиливают человеческое решение, а не подменяют его [5, с. 118–144].

Анализ структуры занятости в Российской Федерации показывает, что цифровизация оказывает значительное влияние на рынок труда, приводя к росту нестандартных форм занятости и изменению требований к квалификации работников [3]. В этих условиях особое значение приобретает способность личности к самостоятельному проектированию карьерной траектории, что требует качественно иного уровня психологической подготовки.

В контексте предложенной концепции цифровой профессиональной идентичности перспективными направлениями психолого-педагогического сопровождения выступают:

1. Разработка и внедрение программ формирования цифровой профессиональной идентичности на всех этапах профессионального становления, начиная со школьного возраста.

2. Создание цифровых инструментов диагностики и развития психологических детерминант профессионального самоопределения, позволяющих учитывать индивидуальные особенности личности.

3. Интеграция психологического сопровождения с цифровыми технологиями, создание персонализированных профориентационных сервисов.

4. Формирование у обучающихся рефлексивной позиции по отношению к собственным способностям и возможностям, что является необходимым условием успешного профессионального самоопределения в условиях высокой неопределенности.

ЗАКЛЮЧЕНИЕ

Проведенный теоретический анализ позволяет заключить, что цифровая трансформация мира профессий инициирует качественные изменения в структуре и содержании профессионального самоопределения личности. В новых социально-экономических условиях профессиональное самоопределение перестает быть единовременным актом выбора и трансформируется в процесс непрерывного проектирования карьерной траектории, основанный на развитой рефлексии, адаптивности и готовности к обучению на протяжении всей жизни.

Предложенная авторская концепция «цифровой профессиональной идентичности» позволяет интегрировать традиционные психологические подходы к профессиональному самоопределению с новыми требованиями, предъявляемыми цифровой экономикой. Психологическими детерминантами успешного профессионального самоопределения в цифровую эпоху выступают: развитые «мягкие навыки» (креативность, коммуникативные способности, саморазвитие, обучаемость); цифровая

самоэффективность и интерес к цифровым технологиям; устойчивая мотивация к профессиональной деятельности; рефлексивная позиция по отношению к собственным способностям и возможностям; готовность к принятию решений в условиях неопределенности.

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Annotatsiya. *Ushbu maqola mehnatni muhofaza qilishni boshqarish tizimida xavfsizlik madaniyatini rivojlantirishning nazariy va amaliy ahamiyatini yoritishga bag‘ishlangan. Tadqiqotda xavfsizlik madaniyati tushunchasi, uning mehnat xavfsizligini boshqarish tizimidagi o‘rni, shuningdek, ISO 45001 xalqaro standarti talablari asosida xavfsizlik madaniyatini shakllantirish va takomillashtirish yo‘nalishlari tahlil qilingan. Maqolada xavfsizlik madaniyatini rivojlantirish ishlab chiqarishdagi baxtsiz hodisalar va kasbiy kasalliklarni kamaytirish, mehnat unumdorligini oshirish hamda tashkilotning ijobiy imijini shakllantirishda muhim omil ekanligi asoslab berilgan.*

Kalit so‘zlar: *mehnatni muhofaza qilish, xavfsizlik madaniyati, mehnat xavfsizligini boshqarish tizimi, ISO 45001, kasbiy xavflar, xavfsiz mehnat sharoitlari.*

Аннотация. *Настоящая статья посвящена освещению теоретической и практической значимости развития культуры безопасности в системе управления охраной труда. В исследовании проанализированы понятие культуры безопасности, её место в системе управления безопасностью труда, а также направления формирования и совершенствования культуры безопасности на основе требований международного стандарта ISO 45001. В статье обосновано, что развитие культуры безопасности является важным фактором снижения производственного травматизма и профессиональных заболеваний, повышения производительности труда и формирования положительного имиджа организации.*

Ключевые слова: *охрана труда, культура безопасности, система управления безопасностью труда, ISO 45001, профессиональные риски, безопасные условия труда.*

Abstract. *This article is devoted to highlighting the theoretical and practical significance of developing a safety culture in the occupational health and safety management*

system. The study analyses the concept of safety culture, its place in the occupational safety management system, as well as the directions for forming and improving safety culture based on the requirements of the international standard ISO 45001. The article substantiates that the development of safety culture is an important factor in reducing occupational injuries and occupational diseases, increasing labour productivity, and forming a positive image of the organisation.

Keywords: *occupational health and safety, safety culture, occupational safety management system, ISO 45001, occupational risks, safe working conditions.*

I. KIRISH

Mehnatni muhofaza qilish – mehnat jarayonida insonning xavfsizligini, hayoti va sog‘lig‘i, ish qobiliyati saqlanishini ta’minlashga doir huquqiy, ijtimoiy-iqtisodiy, tashkiliy, texnikaviy, sanitariya-gigiena, davolash-profilaktika, reabilitatsiya tadbirlari hamda vositalari tizimidir. Zamonaviy ishlab chiqarish muhitida texnologik jarayonlarning murakkablashuvi, yangi xavfli omillarning paydo bo‘lishi mehnat xavfsizligini ta’minlashga bo‘lgan yondashuvlarni qayta ko‘rib chiqishni taqozo etmoqda.

So‘nggi yillarda O‘zbekiston Respublikasida mehnat xavfsizligi sohasida bir qator huquqiy normalar joriy etilgan bo‘lib, ular ish beruvchi va xodimlar o‘rtasidagi munosabatlarni tartibga soladi. Xususan, Vazirlar Mahkamasi qarori bilan Mehnat xavfsizligini boshqarish tizimi to‘g‘risidagi namunaviy nizom tasdiqlandi. Mazkur nizom tashkilotlarda mehnatni muhofaza qilishni boshqarish tizimini rejalashtirish, tashkil etish, faoliyat ko‘rsatish, yuritish va takomillashtirish tartibi hamda mehnatni muhofaza qilish talablarini bajarish samaradorligini baholash, kasbiy xavflarni boshqarish va ularni aniqlash masalalarini qamrab oladi [1].

Biroq, me’yoriy-huquqiy talablarning mavjudligi xavfsiz mehnat sharoitlarini avtomatik ravishda ta’minlamaydi. Mehnatni muhofaza qilish tizimining samaradorligi ko‘p jihatdan tashkilotda shakllangan xavfsizlik madaniyati darajasiga bog‘liq. Xavfsizlik madaniyati – bu ish joyidagi xavfsizlik, xavf-xatar va risk omillariga bo‘lgan munosabatni aks ettiruvchi

fenomen bo‘lib, xodimlar, rahbarlar va boshqaruv organlarining xavfsizlik masalalarida qanchalik mas’uliyatli harakat qilishini ko‘rsatadi [2].

Ushbu maqolaning maqsadi – mehnatni muhofaza qilishni boshqarish tizimida xavfsizlik madaniyatini rivojlantirishning nazariy-uslubiy asoslarini yoritish, uning amaliy ahamiyatini asoslash hamda xavfsizlik madaniyatini takomillashtirish bo‘yicha tavsiyalar ishlab chiqishdan iborat.

Adabiyotlar tahlili

"Xavfsizlik madaniyati" tushunchasi ilk marotaba Xalqaro atom energiyasi agentligi (MAGATE) tomonidan 1986 yildagi Chernobil falokatidan so‘ng keng muhokama qilina boshlangan. Keyinchalik bu tushuncha boshqa sohalar – aviatsiya, neft-gaz, qurilish, transport va ishlab chiqarish sohalariga ham tatbiq etildi.

Zamonaviy ilmiy adabiyotlarda xavfsizlik madaniyati beshta asosiy komponentni o‘z ichiga olishi ko‘rsatilgan: xabardorlik madaniyati (xodimlar xavflar to‘g‘risida xabardor), hisobot berish madaniyati (xodimlar xatolar va xatarli holatlar haqida erkin xabar beradi), adolat madaniyati (xatolar uchun jazolash emas, balki sabablarni aniqlash muhim), moslashuvchanlik madaniyati (tashkilot o‘zgarishlarga tez moslashadi) va o‘rganish madaniyati (xatolardan sabaq olinadi).

Xavfsizlik madaniyatini to‘g‘ri shakllantirish va rivojlantirish ishlab chiqarish korxonalarida mehnatni muhofaza qilish tizimini to‘g‘ri tashkil etish, baxtsiz hodislar sonini kamaytirish va mehnat sharoitlarini yaxshilashda muhim rol o‘ynaydi. Mehnat xavfsizligini boshqarish tizimi quyidagi elementlarni o‘z ichiga oladi: xodimlarni mehnatni muhofaza qilish, texnika xavfsizligi va mehnat gigienasi bo‘yicha o‘qitish; ishlarni xavfsiz bajarish bo‘yicha yo‘riqnomalar ishlab chiqish; ish o‘rinlarini mehnat sharoitlari bo‘yicha attestatsiyadan o‘tkazish; xavfli omillarni aniqlash, kasbiy xavflarni baholash va boshqarish; xodimlarning sog‘lig‘i holatini nazorat qilish; xodimlarni yakka tartibdagi va jamoaviy himoya vositalari bilan ta’minlash [3].

Xalqaro mehnat tashkilotining (XMT) Mehnat xavfsizligi va gigienasi hamda ishlab chiqarish muhiti to‘g‘risidagi 155-sonli Konvensiyasi (1981 y.) qoidalarini milliy qonunchilikka joriy qilish O‘zbekistonda mehnatni muhofaza qilish sohasida muhim qadam bo‘ldi.

Hozirgi kun mehnatni muhofaza qilish tizimini ISO 45001 – mehnatni muhofaza qilishni boshqarish tizimi bo‘yicha xalqaro standart talablari asosida tashkil etishni talab etadi. ISO 45001:2018 – mehnatni muhofaza qilishni boshqarish tizimlari bo‘yicha xalqaro standart bo‘lib, tashkilotlarga mehnatdagi jarohatlanish va kasalliklarning oldini olish, risklarni boshqarish hamda mehnat xavfsizligi ko‘rsatkichlarini uzluksiz takomillashtirish orqali xavfsiz va sog‘lom ish joylarini yaratishga yordam beradi. ISO 45001 standarti mehnatni muhofaza qilishni boshqarish tizimiga quyidagi talablarni belgilaydi: rahbarlik majburiyati va xodimlarning ishtiroki; xavflarni aniqlash va mehnat xavfsizligi risklarini baholash; qonunchilik va boshqa talablarni belgilash; operatsion nazorat va favqulodda vaziyatlarga tayyorgarlik; o‘qitish, xabardorlik va malaka; monitoring, o‘lchash va samaradorlikni baholash; uzluksiz takomillashtirish. Mazkur standart xavfsizlik madaniyatini shakllantirishda alohida ahamiyatga ega, chunki u rahbarlikning majburiyati va xodimlarning faol ishtirokini ta’kidlaydi. Standart boshqaruvning mehnat xavfsizligiga bo‘lgan munosabati, majburiyati va namunasida aks etadi [4].

Biz tomnoimizdan olib borilgan tadqiqotlar shuni ko‘rsatadiki, kuchli xavfsizlik madaniyatini yaratish mehnatni muhofaza qilishni boshqarish tizimini joriy etish hamda xodimlar va rahbarlarning yuqori darajadagi ishtirokini talab qiladi. Bu uzluksiz o‘qitish, rahbarlar va xodimlar o‘rtasida sog‘liq va xavfsizlik masalalari bo‘yicha ochiq muloqot hamda xodimlarni xavfsizlikni ta’minlovchi amaliyotlarga jalb qilishni takozo etadi. Yaxshi xavfsizlik madaniyati mehnat xavfsizligini uzluksiz monitoring qilishni nazarda tutadi: tashkilotning mehnat xavfsizligini qo‘llab-quvvatlash uchun yetarli resurslar va samarali jarayonlarga

egaligi hamda xodimlarning ishlarini xavfsiz bajarish uchun yetarli malakaga ega bo‘lishi ta’minlanadi.

II. TADQIQOT METODOLOGIYaSI (Methods)

Ushbu maqola mehnatni muhofaza qilishni boshqarish tizimida xavfsizlik madaniyatini rivojlantirish masalasiga bag‘ishlangan nazariy tadqiqot bo‘lib, quyidagi metodlardan foydalanilgan:

1. Adabiyotlar tahlili metodi. Mavzuga oid ilmiy-nazariy adabiyotlar, xalqaro standartlar (ISO 45001), me’yoriy-huquqiy hujjatlar va ilmiy maqolalar tizimli tahlil qilindi.

2. Qiyosiy-huquqiy tahlil metodi. O‘zbekiston Respublikasining mehnatni muhofaza qilish sohasidagi qonunchiligi va xalqaro standartlar talablari qiyosiy o‘rganildi.

3. Tizimli yondashuv metodi. Xavfsizlik madaniyati mehnatni muhofaza qilishni boshqarish tizimining ajralmas elementi sifatida kompleks tahlil qilindi.

4. Tahlil va sintez metodlari**.** To‘plangan ma’lumotlar asosida xulosalar va amaliy tavsiyalar ishlab chiqildi.

Tadqiqotning axborot bazasini quyidagilar tashkil etdi:

- O‘zbekiston Respublikasining mehnatni muhofaza qilish sohasidagi qonun hujjatlari;
- ISO 45001:2018 “Mehnatni muhofaza qilishni boshqarish tizimlari. Talablar va foydalanish bo‘yicha yo‘l-yo‘riq” xalqaro standarti;
- Xalqaro mehnat tashkilotining 155-sonli Konvensiyasi;
- Mavzuga oid ilmiy nashrlar va tadqiqot natijalari.

III. NATIJALAR

Tadqiqot maqsadi va vazifalaridan kelib chiqqan holda dastlab xavfsizlik madaniyatini rivojlantirishning asosiy yo‘nalishlari aniqlandi [5].

Tadqiqot natijalariga ko‘ra, mehnatni muhofaza qilishni boshqarish tizimida xavfsizlik madaniyatini rivojlantirish quyidagi asosiy yo‘nalishlarni o‘z ichiga oladi:

- rahbarlikning majburiyati: ushbu omil xavfsizlik madaniyatini shakllantirishning asosiy omili hisoblanadi. Tadqiqotlarimiz ko‘rsatadiki, eng muhim muvaffaqiyat omili "yuqori boshqaruvning qo‘llab-quvvatlashi" bo‘lib, uning o‘rnidan "ijobiy xavfsizlik madaniyati" turadi. Rahbarning mehnat xavfsizligiga bo‘lgan munosabati, uning majburiyati va namunasi orqali ish joyida qanday umumiy fikr-munosabat hukm surishi va mehnat xavfsizligi amaliyotda qanday namoyon bo‘lishi belgilanadi.

- xodimlarning faol ishtiroki: har bir xodimning xavfsizlik madaniyatiga munosababti xavfsizlik madaniyatini rivojlantirishda muhim rol o‘ynaydi. Bu xodimlarni mehnatni muhofaza qilish, texnika xavfsizligi va mehnat gigienasi bo‘yicha tizimli o‘qitish, ularni xavflarni aniqlash va risklarni baholash jarayonlariga jalb qilish hamda xavfsizlik masalalari bo‘yicha ochiq muloqotni tashkil etish orqali amalga oshiriladi.

- tizimli yondashuv va uzluksiz takomillashtirish: tizimli boshqaruv va uzluksiz rivojlanishni ta’minlash xavfsizlik madaniyatining barqarorligini ta’minlaydi. ISO 45001 standarti talablariga muvofiq, tashkilotlar xavflarni aniqlash va xavfsizlik risklarini baholash, operatsion nazoratni o‘rnatish, monitoring va o‘lchash tizimlarini joriy etish orqali mehnat xavfsizligini uzluksiz yaxshilaydi.

- xavfsizlik ko‘rsatkichlarini o‘lchash va baholash: bu omil xavfsizlik madaniyatini boshqarishning ajralmas qismidir. Faqat o‘lchanadigan faoliyatni boshqarish mumkin. O‘lchash natijalari xavfsiz ish usullari bo‘yicha yo‘l-yo‘riq berish, mehnat xavfsizligi faoliyati samaradorligini baholash, chora-tadbirlarning iqtisodiy samaradorligini aniqlash, o‘qitishni rejalashtirish va rag‘batlantirish tizimini takomillashtirish uchun xizmat qiladi.

- xavfsizlik madaniyatini rivojlantirish va baholashda sun’iy intellektdan foydalanish: sun’iy intellekt xavfsizlik madaniyatini baholash va rivojlantirishda kuchli vosita bo‘lishi bilan birga, uning o‘zi ham jiddiy xavf manbaiga aylanishi mumkin. SI dan foydalanishda texnik imkoniyatlar bilan birga axloqiy

mas’uliyat, qat’iy qoidalar va umumiy madaniyatni shakllantirish — bugungi kunning eng muhim vazifalaridan biri hisoblanadi

Xavfsizlik madaniyatini rivojlantirish uning samaradorlik ko‘rsatkichlarini aniqlash orqali monitoring qilib boriladi.

Tadqiqotimiz ko‘rsatishicha, xavfsizlik madaniyatini rivojlantirish quyidagi ijobiy natijalarga olib keladi:

Xavfsizlik madaniyatini rivojlanirishning asosiy ko‘rsatkichlari

№	**Ko‘rsatkich**	**Ta’sir mexanizmi**
1.	Baxtsiz hodisalar va kasbiy kasalliklarning kamayishi	Xavf-xatarlarni o‘z vaqtida aniqlash va profilaktika choralarini ko‘rish
2.	Mehnat unumdorligining oshishi	Xavfsiz mehnat sharoitlari va xodimlar sog‘lig‘ining saqlanishi
3.	Xodimlar sadokati va jalbdorligining oshishi	Xodimlarning boshqaruv jarayonlarida ishtiroki va o‘z qadrini anglashi
4.	Tashkilot obro‘sining yaxshilanishi	Xavfsizlik standartlariga rioya etish va ijobiy imij
5.	Iqtisodiy samara	Baxtsiz hodisalar bilan bog‘liq xarajatlarning kamayishi

ISO 45001 standartini joriy etish orqali tashkilotlar mehnatni muhofaza qilishni boshqarish tizimini takomillashtirib, xavfsizlik madaniyatini mustahkamlaydi. Standart xavfsizlik fikrlashiga sadoqat, yangi ish usullarini qabul qilish va o‘zaro hamkorlikni yaxshilashga undaydi.

O‘zbekistonda mehnatni muhofaza qilish sohasida xavfsizlik madaniyatini rivojlantirish bo‘yicha quyidagi amaliy qadamlar amalga oshirilmoqda:

1. Mehnat xavfsizligini boshqarish tizimi to‘g‘risidagi namunaviy nizomning tasdiqlanishi;

2. Xalqaro mehnat tashkilotining 155-sonli Konvensiyasi qoidalarini milliy qonunchilikka implementatsiya qilish;

3. “O‘zbekiston-2030” strategiyasi doirasida mehnatni muhofaza qilish to‘g‘risidagi qonunchilikni qayta ko‘rib chiqish va mehnat xavfsizligi va mehnat gigienasi tushunchasini joriy qilish;

4. Korxona va tashkilotlarda mehnatni muhofaza qilish xizmatlarini faoliyatini kuchaytirish.

IV. MUHOKAMA

Tadqiqotimiz natijalari shuni ko‘rsatadiki, xavfsizlik madaniyati va mehnatni muhofaza qilishni boshqarish tizimi o‘zaro chambarchas bog‘liq holda faoliyat ko‘rsatadi. Bir tomondan, samarali boshqaruv tizimi xavfsizlik madaniyatini shakllantirish uchun zarur asos bo‘lib xizmat qiladi. Ikkinchi tomondan, yuqori darajadagi xavfsizlik madaniyati boshqaruv tizimining samarali amal qilishini ta’minlaydi.

Boshqaruv tizimi xavfsizlik madaniyatini quyidagi jihatlardan qo‘llab-quvvatlaydi:

- struktura va jarayonlar – aniq belgilangan tartiblar, yo‘riqnomalar, hujjatlashtirish tizimi;

- resurslar bilan ta’minlash – moddiy-texnikaviy baza, o‘qitish, malaka oshirish;

- nazorat va monitoring – ko‘rsatkichlarni o‘lchash, baholash va takomillashtirish.

Xavfsizlik madaniyati esa boshqaruv tizimiga quyidagilar orqali ta’sir ko‘rsatadi:

- xodimlarning xavfsizlik talablariga ongli munosabati;

- xavf-xatarlar to‘g‘risida o‘z vaqtida xabar berish va muammolarni oshkora muhokama qilish;

- xavfsizlikni tashkilotning asosiy qadriyatlaridan biri sifatida qabul qilish.

Ta’kidlash joizki, amaliyotda xavfsizlik madaniyatini rivojlantirish yo‘lida bir qator qo‘yidagi to‘siqlar mavjud bo‘lib, ularni bartaraf etishni aynan

mehnatni muhg‘ofaza qilishni tizimli tashkil etish bilan bog‘liq holda amalga oshirish mumkin:

- rahbarlikning xavfsizlik masalalariga yetarli darajada e’tibor bermasligi. Rahbarning mehnat xavfsizligiga bo‘lgan munosabati umumiy fikr-munosabatni belgilaydi. Agar rahbar xavfsizlikni ishlab chiqarish ko‘rsatkichlari va muddatlar bilan raqobatlashadigan qimmat sifatida ko‘rsa, xavfsizlik madaniyatini shakllantirish qiyinlashadi.

- xodimlarning xavfsizlik masalalariga bo‘lgan passiv munosabati. Xodimlar faqat ko‘rsatmalarga amal qiluvchi ob’ekt sifatida emas, balki xavfsizlikni ta’minlash jarayonining faol ishtirokchisi sifatida qaralishi kerak.

- xavfsizlik ko‘rsatkichlarini o‘lchash va monitoring qilish tizimining yetarli emasligi. Faqat o‘lchanadigan faoliyatni boshqarish mumkinligini inobatga olgan holda, tashkilotlarda xavfsizlik ko‘rsatkichlari tizimini joriy etish zarur.

- xavfsizlik madaniyatini faqat texnik chora-tadbirlar bilan chegaralash. Xavfsizlik madaniyati nafaqat texnik jihatlarni, balki psixosotsial omillarni, muloqot madaniyatini, tashkiliy qadriyatlarni ham qamrab oladi.

Xavfsizlik madaniyatini samarali rivojlantirish rahbarlikning faol pozitsiyasini shakllantirish, xodimlarni jalb qilish mexanizmlarini takomillashtirish, uzluksiz o‘qitish va malaka oshirish tizimini joriy etish, ochiq muloqot va xabardorlik madaniyatini shakllantirish, xavfsizlik ko‘rsatkichlari tizimini ishlab chiqish va monitoringini olib borish ishlarini tashkil etishga bog‘liq [6].

Rahbarlar xavfsizlik masalalarida shaxsiy namuna ko‘rsatishi, "xavfsizlik birinchi o‘rinda" prinsipiga amal qilishi va qoidalar barcha xodimlar uchun bir xilda qo‘llanilishini ta’minlashi lozim. Xodimlarni xavflarni aniqlash, risklarni baholash va profilaktika choralarini ishlab chiqish jarayonlariga faol jalb qilish. Xavfsizlik qo‘mitalari va ishchi guruhlarini tashkil etish.

Uzluksiz o‘qitish va malaka oshirish tizimini joriy etish xodimlarning mehnatni muhofaza qilish, texnika xavfsizligi va mehnat gigienasi bo‘yicha bilim va ko‘nikmalarini muntazam oshirib borish maqsadida amalga oshirilishi zarur. Shuningdek, xodimlarning xavf-xatarli holatlar va yaqin xatolar to‘g‘risida erkin xabar berishi uchun qulay muhit yaratish ham muhim rol o‘ynaydi. Bu ochiq muloqot va xabardorlik madaniyatini shakllantirish orqali amalga oshiriladi.

Mehnat xavfsizligi faoliyati samaradorligini ob’ektiv baholash imkonini beradigan ko‘rsatkichlar tizimini joriy etish xavfsizlik ko‘rsatkichlari tizimini ishlab chiqish va monitoringini olib borish vazifalariga kiradi. Natijada xavfsizlik madaniyatining iqtisodiy samaradorligini ta’minlashga erishiladi [7].

Xavfsizlik madaniyatini rivojlantirish nafaqat ijtimoiy ahamiyatga, balki iqtisodiy samaradorlikka ham ega. Baxtsiz hodisalar va yaqin xatolar nafaqat qiyinchiliklar, balki biznes yo‘qotishlariga ham olib keladi. Xavfsizlik madaniyatini rivojlantirish orqali: baxtsiz hodisalar va kasbiy kasalliklar bilan bog‘liq bevosita va bilvosita xarajatlar kamayadi, ishlab chiqarishning to‘xtab qolish vaqti qisqaradi, xodimlarning mehnat unumdorligi oshadi, tashkilotning ijobiy imiji shakllanadi va bozordagi raqobatbardoshligi oshadi va mehnat xavfsizligi talablariga rioya etish orqali qonunchilik bilan bog‘liq risklar kamayadi.

V. XULOSA

Mehnatni muhofaza qilishni boshqarish tizimida xavfsizlik madaniyatini rivojlantirish zamonaviy mehnat munosabatlarining dolzarb vazifalaridan biri hisoblanadi. Xavfsizlik madaniyati mehnatni muhofaza qilishni boshqarish tizimining ajralmas elementi bo‘lib, u xodimlar, rahbarlar va boshqaruv organlarining xavfsizlik masalalariga bo‘lgan munosabati, bilimlari va harakatlari yig‘indisini ifodalaydi. Xavfsizlik madaniyatini rivojlantirish baxtsiz hodisalar va kasbiy kasalliklarni kamaytirish, mehnat unumdorligini oshirish,

xodimlar sadokati va jalbdorligini kuchaytirish hamda tashkilotning ijobiy imijini shakllantirishga xizmat qiladi.

ISO 45001 xalqaro standarti xavfsizlik madaniyatini rivojlantirish uchun samarali vosita bo‘lib, u rahbarlik majburiyati, xodimlar ishtiroki, xavflarni aniqlash va risklarni baholash, uzluksiz takomillashtirish kabi talablarni belgilaydi [4]. Xavfsizlik madaniyatini samarali rivojlantirish uchun rahbarlikning faol pozitsiyasi, xodimlarni jalb qilish, uzluksiz o‘qitish, ochiq muloqot va xavfsizlik ko‘rsatkichlari tizimini joriy etish kabi strategik yo‘nalishlarni amalga oshirish zarur.

O‘zbekistonda mehnatni muhofaza qilish sohasida xavfsizlik madaniyatini rivojlantirish bo‘yicha muhim qadamlar qilinmoqda, jumladan, Mehnat xavfsizligini boshqarish tizimi to‘g‘risidagi namunaviy nizomning tasdiqlanishi, XMTning 155-sonli Konvensiyasi [8] qoidalarini milliy qonunchilikka implementatsiya qilish kabi ishlar amalga oshirilmoqda.

Kelgusi tadqiqotlarimizda xavfsizlik madaniyatini baholashning aniq mezonlarini ishlab chiqish, turli soha va tashkilotlarda xavfsizlik madaniyati darajasining taqqoslama tahlilini amalga oshirish, xavfsizlik madaniyatini rivojlantirishning iqtisodiy samaradorligini miqdoriy baholash, xavfsizlik madaniyati indeksini baholashda sun’iy intellektdan foydalanish metodikasini ishlab chiqish kabi masalalar rejalashtirilgan. .

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8-SECTION

XX ASR BOSHLARI O‘ZBEK LIRIKASIDA ANTONOMAZIYALAR SEMANTIKASI (CHO‘LPON, SIDQIY XONDAYLIQIY VA USMON NOSIR IJODI MISOLIDA)

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Annotatsiya *: Mazkur maqolada XX asr boshlaridagi o‘zbek she’riyatida antonomaziya badiiy-estetik vositasining semantik xususiyatlari Cho‘lpon, Sidqiy Xondayliqiy hamda Usmon Nosir lirikasi misolida tahlil qilinadi. Tadqiqotda antonomaziyaning poetik matnda individual obraz yaratish, milliy tafakkurni ifodalash, diniy-mifologik va tarixiy shaxslar nomlari orqali ramziy ma'nolarni shakllantirishdagi o‘rni yoritiladi. Shoirlar ijodida uchraydigan* ***Majnun****,* ***Layli****,* ***Masih****,* ***Azroil****,* ***Iblis****,* ***Shayton****,* ***Otello****,* ***Gamlet****,* ***Ofeliya****,* ***Dante****,* ***Beatriche*** *kabi antonomaziyalar semantik-pragmatik jihatdan tahlil qilinadi. Tahlillar shuni ko‘rsatadiki, antonomaziyalar jadid va jadid an'analarini davom ettirgan lirikada shaxsning ichki kechinmalarini ifodalash bilan bir qatorda, milliy uyg‘onish g‘oyalarini estetik jihatdan kuchaytiruvchi poetik birlik sifatida ham namoyon bo‘ladi.*

Kalit so‘zlar: *antonomaziya, semantika, jadid adabiyoti, Cho‘lpon, Sidqiy Xondayliqiy, Usmon Nosir, poetika, lingvopoetika, badiiy matn, onomastika.*

Abstract:*This article examines the semantic characteristics of antonomasia in early twentieth-century Uzbek poetry through the lyrical works of Cholpon, Sidqiy Xondayliqiy, and Usmon Nosir. The study explores the role of antonomasia in creating artistic imagery, expressing national consciousness, and conveying symbolic meanings through religious, mythological, and historical names. The semantic and pragmatic functions of antonomasias such as Majnun, Layli, Masih, Azrael, Iblis, Shaytan, Othello, Hamlet, Ophelia, Dante, and Beatrice are analyzed. The findings indicate that antonomasia functions not only as a stylistic device expressing emotional experience but also as an important linguistic means of reinforcing the ideas of national awakening and artistic thinking in Uzbek lyrical poetry.*

Keywords: *antonomasia, semantics, Jadid literature, Cholpon, Sidqiy Xondayliqiy, Usmon Nosir, linguopoetics, poetic language.*

KIRISH (INTRODUCTION)

XX asr boshlarida o‘zbek adabiyoti taraqqiyotida jadidchilik harakati nafaqat ijtimoiy-siyosiy tafakkur, balki badiiy til taraqqiyotida ham yangi bosqichni boshlab berdi. Jadid shoirlari she'riy nutqning ifoda imkoniyatlarini kengaytirish, milliy o‘zlikni badiiy-estetik jihatdan yoritish hamda zamonaviy poetik tafakkurni shakllantirishda turli stilistik vositalardan unumli foydalandilar. Shunday vositalardan biri antonomaziya bo‘lib, u shaxs nomining ko‘chma ma'noda qo‘llanishi yoki muayyan sifatni ifodalovchi nomning umumlashgan semantik birlikka aylanishi bilan tavsiflanadi.

Antonomaziya qadimiy ritorikadan boshlab zamonaviy lingvopoetik tadqiqotlargacha badiiy tasvirning muhim komponenti sifatida e'tirof etilgan. I.R. Galperin antonomaziyani stilistik semantikaning alohida turi sifatida baholab, unda atoqli ot va turdosh ot semantikalarining o‘zaro kesishishi kuzatilishini ta'kidlaydi. V.V. Vinogradov esa bunday birliklarning badiiy matndagi ekspressiv yukini alohida e'tirof etadi. O‘zbek tilshunosligida antonomaziya masalalari asosan onomastika va badiiy til doirasida tadqiq etilgan bo‘lsa-da, jadid lirikasi misolida uning semantik tizimi hali yetarlicha kompleks o‘rganilmagan.

Cho‘lpon lirikasida **malak**, **pari**, **Azroil**, **shayton**, **iblis** singari diniy va mifologik antonomaziyalar inson ruhiyati hamda ozodlik g‘oyalarini ramziy ifodalash uchun qo‘llanadi. Jumladan, shoirning “Xayoli” va “Tabiatga” she'rlarida **malak**, **shayton**, **dev**, **alvasti** kabi birliklar real shaxs nomi sifatida emas, balki inson qalbidagi ezgulik va yovuzlikning poetik timsollari sifatida namoyon bo‘ladi.

Sidqiy Xondayliqiy ijodida esa Sharq mumtoz adabiyoti an'analari davom ettirilib, **Masih**, **Yusuf**, **Ya'qub**, **Shavkat**, **sanam** kabi antonomaziyalar oshiq

va ma'shuqa obrazlarini estetik ideallashtirish vositasiga aylanadi. Ushbu nomlar individual shaxsni emas, balki muayyan badiiy konseptni ifodalaydi.

Usmon Nosir lirikasida esa jahon adabiyoti qahramonlari – **Petrarka**, **Dante**, **Beatriche**, **Gamlet**, **Ofeliya**, **Otello**, **Dezdemona** kabi nomlar yangi semantik qatlam hosil qilib, milliy she'riyatni umuminsoniy madaniy kontekst bilan bog‘laydi. Bu antonomaziyalar shoirning estetik tafakkuri va intertekstual poetikasining muhim ko‘rsatkichidir. Mazkur tadqiqotning maqsadi Cho‘lpon, Sidqiy Xondayliqiy hamda Usmon Nosir lirikasida uchraydigan antonomaziyalarning semantik xususiyatlarini lingvopoetik nuqtai nazardan tahlil qilish, ularning badiiy matn mazmunini shakllantirishdagi funksiyalarini aniqlash hamda o‘zbek poetik tilining taraqqiyotidagi o‘rnini belgilashdan iborat.

MATERIALS AND METHODS

Mazkur tadqiqotning empirik materialini Abdulhamid Cho‘lponning *Binafsha*, Sidqiy Xondayliqiyning *Navbahor* hamda Usmon Nosirning *Ertani sevinib kut!* nomli she'riy to‘plamlarida uchraydigan antonomaziyalar tashkil etadi. Tadqiqot obyekti sifatida mazkur shoirlarning lirik asarlarida qo‘llangan diniy, mifologik, tarixiy va adabiy manbalarga mansub atoqli otlarning poetik nutqdagi semantik transformatsiyasi tanlandi. Tadqiqotning nazariy-metodologik asosini onomastika, semasiologiya, lingvopoetika hamda badiiy matn lingvistikasi sohasida amalga oshirilgan ilmiy tadqiqotlar tashkil etadi. Antonomaziya hodisasini tahlil qilishda I.R. Galperinning stilistik birliklar haqidagi konsepsiyasi, V.V. Vinogradovning badiiy nutq semantikasi yuzasidan qarashlari, shuningdek, D. Quronov, Sh. Rahmatullayev, B. Qosimov va boshqa olimlarning poetik matn tahliliga oid nazariy yondashuvlar metodologik asos sifatida qabul qilindi.

Tadqiqot davomida bir-birini to‘ldiruvchi bir necha ilmiy metodlardan kompleks tarzda foydalanildi. Tavsifiy metod yordamida she'riy matnlarda uchraydigan antonomaziyalar aniqlanib, ularning qo‘llanish xususiyatlari

tizimlashtirildi. Semantik tahlil metodi asosida har bir antonomaziyaning lug‘aviy ma'nosi bilan poetik kontekstda hosil qilayotgan ko‘chma va ramziy ma'nolari o‘rtasidagi munosabat o‘rganildi. Kontekstual tahlil orqali antonomaziyaning she'r mazmuni, obrazlar tizimi hamda muallifning kommunikativ maqsadini ifodalashdagi o‘rni aniqlandi. Qiyosiy metod vositasida esa Cho‘lpon, Sidqiy Xondayliqiy va Usmon Nosir ijodida antonomaziyalarning semantik hamda funksional xususiyatlari o‘zaro taqqoslandi.

Tahlil jarayonida har bir antonomaziya alohida til birligi sifatida emas, balki badiiy matnning umumiy semantik strukturasini tashkil etuvchi lingvopoetik unsur sifatida baholandi. Shu maqsadda atoqli otning dastlabki nominativ ma'nosi, uning madaniy-assotsiativ mazmuni hamda she'riy kontekstda yuzaga keladigan ikkilamchi semantik qatlami izchil tahlil qilindi. Bunda antonomaziyalarning faqat nominativ vazifasi emas, balki ularning ekspressiv, emotsional, baholovchi va ramziy funksiyalari ham hisobga olindi.Mazkur tadqiqotda lingvokulturologik yondashuv ham qo‘llanildi. Chunki she'riy matnlarda uchraydigan **Majnun**, **Layli**, **Masih**, **Azroil**, **Shayton**, **Iblis**, **Otello**, **Gamlet**, **Dezdemona**, **Ofeliya** kabi antonomaziyalar muayyan tarixiy yoki badiiy shaxsni emas, balki xalqning madaniy xotirasida shakllangan konseptlarni ifodalaydi. Shu sababli ularning poetik semantikasi milliy va umuminsoniy madaniy kodlar bilan uzviy bog‘liqlikda talqin qilindi. Tadqiqotning ilmiy yangiligini ta'minlash maqsadida antonomaziyalar faqat stilistik vosita sifatida emas, balki **ko‘p qatlamli semantik birlik** sifatida o‘rganildi. Tahlil davomida ularning denotativ, konnotativ va pragmatik ma'nolari o‘zaro bog‘liqlikda tahlil qilinib, badiiy matnda hosil qilayotgan estetik ta'siri hamda muallif individual uslubini shakllantirishdagi o‘rni yoritildi. Ushbu yondashuv antonomaziyaning poetik matndagi funksional imkoniyatlarini yanada chuqurroq ochib berishga xizmat qildi. Tadqiqot natijalarining ishonchliligi tanlangan materiallarning bevosita asl manbalar

asosida tahlil qilinganligi, lingvistik tahlilning zamonaviy metodlariga tayanganligi hamda olingan xulosalarning o‘zaro qiyosiy va kontekstual tahlillar bilan asoslanganligi orqali ta'minlandi.

RESULTS

Tahlil natijasida Cho'lpon, Sidqiy Xondayliqiy va Usmon Nosir lirikasida antonomaziyalar semantik jihatdan bir xil vazifani bajarmasligi aniqlandi. Ularning qo'llanishi shoirning poetik maqsadi hamda badiiy tafakkuri bilan belgilanadi. Cho'lpon she'riyatida antonomaziyalar diniy-mifologik konseptlarni individuallashtirishga xizmat qiladi. **"Malak"**, **"pari"**, **"shayton"**, **"dev"**, **"Azroil"** kabi nomlar nominativ ma'nodan uzoqlashib, inson ruhiyatining ichki holatini ifodalovchi semantik belgiga aylanadi. Natijada ushbu birliklarning referensial vazifasi susayadi, konnotativ mazmuni esa kuchayadi.

Sidqiy Xondayliqiy lirikasida antonomaziyaning semantik modeli klassik poetik an'anaga asoslanadi. **"Masih"** nomi shifo konseptini emas, balki ruhiy najot semasini, **"Ya'qub"** hijron konseptini, **"Yusuf"** esa mutlaq go'zallik semasini faollashtiradi. Bunday holatda antonomaziya individual nomni emas, madaniy xotirada shakllangan tayyor semantik modelni aktuallashtiradi.

Usmon Nosir poetikasida antonomaziyalar intertekstual semantika asosida shakllanadi. **"Gamlet"**, **"Otello"**, **"Dezdemona"**, **"Ofeliya"**, **"Dante"** singari birliklar she'r mazmuniga yangi semantik qatlam olib kiradi. Ushbu nomlar muallif tomonidan qayta interpretatsiya qilinib, o'zbek lirik tafakkuriga moslashtiriladi. Natijada antonomaziya milliy poetik makon bilan jahon adabiy tafakkuri o'rtasidagi semantik ko'prik vazifasini bajaradi. Qiyosiy tahlil uchta semantik tendensiyani aniqlash imkonini berdi. Birinchi tendensiya — sakral semantikaning ustunligi bo'lib, u asosan Cho'lpon poetikasida kuzatiladi. Ikkinchi tendensiya — mumtoz poetik semantikaning transformatsiyasi bo'lib, Sidqiy Xondayliqiy lirikasiga xosdir. Uchinchi tendensiya — intertekstual semantikaning kengayishi bo'lib, Usmon Nosir poetikasida yaqqol namoyon bo'ladi. Shuningdek, antonomaziyalar poetik matnda uch xil semantik mexanizm

asosida ishlashi aniqlandi: semantik umumlashtirish**,** konnotativ kengayish va konseptual ko'chirish. Mazkur mexanizmlar natijasida atoqli ot o'zining dastlabki nominativ vazifasidan chiqib, badiiy matnning asosiy mazmunini tashkil etuvchi lingvopoetik birlikka aylanadi. Olingan natijalar shuni ko'rsatadiki, jadid va jadid an'analari ta'siridagi o'zbek lirikasida antonomaziya shaxs nomini almashtiruvchi stilistik vosita emas, balki milliy poetik tafakkurning semantik modeli sifatida faoliyat ko'rsatadi.

DISCUSSION

Tadqiqot natijalari antonomaziyaning o‘zbek poetik matnida an'anaviy stilistik vosita doirasidan chiqib, murakkab semantik mexanizm sifatida faoliyat yuritishini ko‘rsatdi. Bu holat I.R. Galperinning antonomaziya haqidagi qarashlarini qisman tasdiqlaydi. Olim antonomaziyani atoqli ot va turdosh ot semantikalarining kesishish nuqtasi sifatida izohlasa (Galperin, 1977), mazkur tadqiqotda ushbu hodisa badiiy matnda yangi konseptual mazmun hosil qiluvchi lingvopoetik birlik sifatida namoyon bo‘lishi aniqlandi. V.V. Vinogradov poetik nutqda tarixiy va mifologik nomlarning ekspressiv imkoniyatlari ularning madaniy assotsiativ xotirasi bilan bog‘liqligini ta'kidlagan (Vinogradov, 1980). Tadqiq etilgan she'riy matnlarda ham aynan shu hodisa kuzatildi. Biroq Cho‘lpon, Sidqiy Xondayliqiy va Usmon Nosir ijodida antonomaziyalar tayyor madaniy belgilar sifatida emas, balki muallifning individual poetik tafakkuri ta'sirida yangi semantik mazmun kasb etgan birliklar sifatida namoyon bo‘ladi. Shuningdek, olingan natijalar G. Lakoff va M. Johnsonning konseptual metafora nazariyasi bilan ham uyg‘unlashadi (Lakoff & Johnson, 1980). Tadqiqot davomida aniqlangan antonomaziyalar alohida nomni emas, balki madaniy konseptlarni faollashtirishi kuzatildi. Shu jihatdan ular poetik matnda konseptual modellashtirish vositasi vazifasini bajaradi. O‘zbek adabiyotshunosligida jadid she'riyati ko‘proq g‘oyaviy-estetik yoki tarixiy nuqtai nazardan tahlil qilingan bo‘lsa, ushbu tadqiqot antonomaziyalarni semantik tizim sifatida o‘rganishga qaratilgani bilan farqlanadi. Tahlillar shuni ko‘rsatdiki, diniy, mifologik va

adabiy manbalardan olingan nomlar poetik matnda yagona funksiyani bajarmaydi. Ularning semantik faolligi muallifning estetik maqsadi, matn konteksti va madaniy xotira bilan uzviy bog‘liq holda shakllanadi. Shu bois antonomaziyani faqat stilistik figura sifatida emas, balki **lingvokulturologik va lingvopoetik kategoriya** sifatida talqin qilish maqsadga muvofiqdir. Bunday yondashuv jadid va XX asr boshlaridagi o‘zbek lirikasining semantik tizimini chuqurroq anglash hamda poetik matnning yashirin ma'no qatlamlarini ochishda yangi ilmiy imkoniyatlarni yuzaga keltiradi.

CONCLUSION

Tadqiqot natijalari Cho‘lpon, Sidqiy Xondayliqiy va Usmon Nosir lirikasida antonomaziyalar badiiy ifoda vositasidan ko‘ra kengroq semantik funksiyani bajarishini ko‘rsatdi. Ular poetik matnda obraz yaratish, madaniy xotirani faollashtirish va muallifning individual estetik konsepsiyasini ifodalashning muhim lingvopoetik vositasi hisoblanadi.

Aniqlanishicha, Cho‘lpon poetikasida diniy-mifologik antonomaziyalar sakral semantikani, Sidqiy Xondayliqiy ijodida mumtoz poetik konseptlarni, Usmon Nosir lirikasida esa intertekstual semantik qatlamni shakllantiradi. Bu farqlar antonomaziyalarning poetik matndagi funksiyasi muallif uslubi va badiiy tafakkuri bilan bevosita bog‘liqligini tasdiqlaydi. Tadqiqot davomida antonomaziyaning semantik umumlashtirish**,** konnotativ kengayish va konseptual modellashtirish mexanizmlari asosida faoliyat yuritishi aniqlandi. Mazkur natijalar o‘zbek poetik tilida antonomaziyaning lingvopoetik imkoniyatlarini kengroq baholashga xizmat qiladi hamda bu yo‘nalishda keyingi tadqiqotlar uchun nazariy asos yaratadi.

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“BOBURNOMA”NING INGLIZCHA TARJIMALARIDA TO‘LG‘AMA HARBIY TERMININING LEKSIK-SEMANTIK TALQINI

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Annotatsiya. *Tezisda “Boburnoma” matnidagi to‘lg‘ama harbiy terminining leksik-semantik xususiyatlari hamda Jon Leyden-Uilyam Erskin, Annette Beverij va Uiler Tekston tarjimalarida qayta ifodalanishi qiyosiy tahlil qilindi. Termin tarjimasida transliteratsiya va izohlash, tavsifiy tarjima hamda funksional ekvivalentdan foydalanish holatlari aniqlandi. Tahlil natijasida to‘lg‘ama faqat yon qanotdan hujum qilish harakatini emas, balki ushbu vazifani bajaruvchi harbiy bo‘linma va jangovar taktikani ham anglatishi, tarjima tanlovi esa uning terminologik maqomi hamda tarixiy-madaniy semalarining saqlanish darajasiga ta’sir qilishi asoslandi.*

Kalit so‘zlar: *“Boburnoma”, harbiy termin, to‘lg‘ama, leksik-semantik tahlil, ekvivalentlik, transliteratsiya, tavsifiy tarjima, funksional ekvivalent.*

Abstract. *This paper examines the lexical-semantic features of the military term to‘lg‘ama in the Baburnama and compares its renderings in the English translations by John Leyden and William Erskine, Annette Beveridge, and Wheeler Thackston. The analysis identifies transliteration with explanation, descriptive translation, and functional equivalence as the main strategies. The findings show that to‘lg‘ama denotes not only a flanking action but also the military unit assigned to perform it and the broader tactical practice. Consequently, each translation strategy preserves the term’s terminological status and historical-cultural meaning to a different degree.*

Keywords: *Baburnama, military term, to‘lg‘ama, lexical-semantic analysis, equivalence, transliteration, descriptive translation, functional equivalent.*

KIRISH

“Boburnoma”da Boburning janglar tasviri nafaqat o‘sha davr qurol-aslahalari, balki jang olib borish usullari, qo‘shinlarning jangovar joylashuvi, harbiy bo‘linma va unvonlar, shuningdek, xizmat va boshqaruv tuzilmalariga oid

terminlar orqali yoritiladi. Mazkur birliklar o‘rta asr harbiy tizimining strukturaviy va funksional modelini aks ettiruvchi maxsus leksik qatlamni tashkil qiladi. Shu bois ularning inglizcha tarjimalarda berilishini o‘rganishda oddiy lug‘aviy moslik bilan cheklanib bo‘lmaydi; termin ifodalagan harakat, bo‘linma, taktika va tarixiy-madaniy belgilarning qay darajada saqlangani ham e’tiborga olinishi lozim.

Tadqiqotning maqsadi “Boburnoma”dagi to‘lg‘ama terminining semantik tarkibini aniqlash, uning uch inglizcha tarjimada qo‘llangan muqobillarini qiyoslash va ushbu yechimlarning funksional-ekvivalentlik darajasini baholashdan iborat. Tahlilda leksik-semantik, kontekstual va chog‘ishtirma metodlardan foydalanildi. Manba sifatida “Boburnoma”ning o‘zbekcha matni hamda Leyden-Erskin, Beverij va Tekston tarjimalari olindi.

ASOSIY QISM

Asarda uchraydigan harbiy-taktik jang usullaridan biri *to‘lg’ama* bo‘lib, o‘rta asrlarda mo‘g’ul va turklar, xususan, ko‘chmanchi o‘zbeklar tarafidan qo‘llanilgan maxsus harbiy taktikani ifodalaydi. Bunda saf tortib turgan dushman qo‘shiniga kutilmaganda yon tarafdan aylanib o‘tib hujum qilingan. [8, 230] Termin faqat harakat nomi sifatida emas, shu vazifani bajaruvchi otliq guruh yoki bo‘linma ma’nosida ham qo‘llanadi. Abel Pavet de Courteille lug‘atida ham u dushmanni aylanib o‘tish uchun pistirmaga joylashtirilgan harbiy bo‘linma va dushman qanotini aylanib o‘tish harakati sifatida izohlanadi [5, 243]. Demak, terminning semantik tarkibida kamida uch unsur – harbiy harakat, uni bajaruvchi bo‘linma va jangovar taktika – o‘zaro birlashadi.

Harbiy terminologiyada *flanking attack* dushman qo‘shinining yon qanotiga qaratilgan hujum sifatida izohlanadi [6, 30]. Ushbu ta’rif to‘lg‘amaning asosiy yo‘nalish semasiga yaqin bo‘lsa-da, tarixiy manbadagi termin bundan kengroq mazmunga ega. *To‘lg‘ama* oldindan tayinlangan askarlar tomonidan bajariladi, harakat muayyan tartibda tashkil etiladi va dushmanni yon yoki orqa tomondan qurshash maqsadini ko‘zlaydi. Shuning uchun uni zamonaviy harbiy

termin bilan almashtirish mazmunni tushunarli qiladi, biroq tarixiy birlikning milliy-harbiy xosligini qisman neytrallashtirishi mumkin.

Bobur ushbu taktikani o‘zbek qo‘shinining muhim jangovar fazilati sifatida alohida qayd etadi:

> *“O‘zbekning urushda bir ulug‘ hunari ushbu to‘lg‘amadur, hech urush to‘lg‘amasiz bo‘lmas” [1, 83].*

Mazkur parcha tarjimonlarning strategik tanlovini yaqqol ko‘rsatadi. Leyden-Erskin variantida termin *tulughmeh* shaklida transliteratsiya qilinib, qavs ichida *turning the enemy’s flank* izohi beriladi [2, 149]. Bu usul asliyatdagi milliy terminni saqlaydi va ayni paytda ingliz o‘quvchisiga uning umumiy mazmunini ochadi. Transliteratsiya asliyatdagi terminning milliy-tarixiy shaklini saqlasa, izoh uning harbiy-taktik mazmunini ingliz o‘quvchisiga tushuntirishga xizmat qiladi. Beverij to‘lg‘amani *turning-movement* shaklida beradi [3, 140]. Ushbu tavsifiy ekvivalent manyovrning aylanma xususiyatini ifodalaydi, biroq asl terminning terminologik maqomi va tarixiy koloritini qisman susaytiradi. Tekston esa *flank assault* funksional ekvivalentidan foydalanadi [4, 126]. Bu shakl zamonaviy ingliz harbiy terminologiyasida aniq va ixcham bo‘lsa-da, to‘lg‘amaning bo‘linma hamda tarixiy taktika ma’nolarini har bir kontekstda to‘liq qamrab olmaydi.

Termin qo‘llangan boshqa kontekstlar uning ma’nosi vaziyatga qarab faollashishini ko‘rsatadi. Bir o‘rinda u to‘lg‘amaga tayinlangan kishilarni, ikkinchi o‘rinda mustaqil jangovar guruhni, yana bir kontekstda dushmanni o‘rab olish harakatini bildiradi. Shu sabab birgina doimiy ekvivalent barcha holatlar uchun bir xil darajada mos kelmaydi. Quyidagi qiyosiy jadval tarjimonlar tanlovidagi farqlarni umumlashtiradi.

1-jadval. To‘lg‘ama terminining inglizcha tarjimalarda berilishi

№	Bobur	Leyden–Erskin	Beverij	Tekston
1	… to‘lg‘amag‘a tayin bo‘lg‘on kishi … (193)	*... flankers ... (186, II jild)*	*... turning-parties ... (473, II jild)*	*... the men who had been assigned to the flank assault ... (326)*
2	… to‘lg‘ama kishisi … (193)	*... flankers ... (186, II jild)*	*... turning-parties ... (473, II jild)*	*... flank assaulter ... (326)*
3	… to‘lg‘ama g‘animning girdo-girdini olib … (193)	*... flankers having surrounded the enemy ... (187, II jild)*	*... turning parties having surrounded the enemy ... (474, II jild)*	*... flank assault ... (326)*
4	… to‘lg‘ama … (227)	*... a tulughmeh (or flanking party) ... (299, II jild)*	*... the flank-movement (tūlghāma) ... (568, II jild)*	*... rear assault ... (383)*
5	… o‘ng qo‘l to‘lg‘amasida edi … (230)	*... commanded the tulughmeh (or flanking division) on the right ... (310, II jild)*	*... who in the flanking-party of the right-hand ... (579, II jild)*	*... who was in charge of the right-wing flank assault ... (388)*

Jadvaldagi misollar Leyden-Erskin tarjimasida manba tiliga yo‘naltirilgan yondashuv ustunligini ko‘rsatadi. Tarjimon tulughmeh shaklini saqlagan holatlarda unga *flanking party* yoki *flanking division* izohlarini qo‘shadi; shaxsni bildiruvchi kontekstlarda esa *flankers* umumlashtiruvchi muqobilidan foydalanadi. Bu yechim terminning tarixiy belgilarini qisman saqlaydi, biroq harakat va bo‘linma ma’nolari o‘rtasidagi farq doimo ochiq ko‘rinmaydi.

Beverijning *turning-parties* va *flank-movement* variantlari to‘lg‘amaning harakat hamda guruh ma’nolarini kontekstga mos ajratishga intiladi. *Turning-parties* askarlar yoki bo‘linmani, *flank-movement* esa manyovrni bildiradi. Shunga qaramay, ushbu umumiste’moldagi tavsifiy birliklar asl terminning milliy-tarixiy belgilarini kamaytiradi. Tekston tarjimasida *flank assaulter, flank assault, rear assault* va *right-wing flank assault* kabi muqobillar qo‘llanadi. Mazkur funksional ekvivalentlar jang yo‘nalishi, bajaruvchi shaxs va hujum

turini ingliz o‘quvchisiga aniq yetkazadi. Ayni paytda bir terminning turli zamonaviy birikmalar bilan berilishi asliyatdagi yagona terminologik tizimni parchalab, semantik konkretlashtirish bilan birga tarixiy-madaniy neytrallashuvni ham yuzaga keltiradi.

Qiyosiy tahlil shuni ko‘rsatadiki, to‘lg‘amani tarjima qilishda ikki talab o‘rtasida muvozanat zarur: bir tomondan, o‘quvchiga taktikaning mohiyatini tushunarli yetkazish; ikkinchi tomondan, asliyatning tarixiy terminini va uning ko‘p qatlamli ma’nosini saqlash. Shu nuqtai nazardan, termin birinchi marta uchraganda transliteratsiyalangan to‘lg‘ama (*tulughmeh*) shaklini berib, qavs yoki izohda *flank assault / flanking manoeuvre* tarzidagi funksional tushuntirishni keltirish eng maqbul yechim bo‘lishi mumkin. Keyingi o‘rinlarda esa kontekstga *qarab to‘lg‘ama bo‘linmasi*, to‘lg‘amachi yoki *to‘lg‘ama* harakati ma’nolarini farqlash lozim. Bunday kombinatsiyalangan usul ham terminning milliy-tarixiy xususiyatini, ham matnning kommunikativ aniqligini ta’minlaydi.

XULOSA

“Boburnoma”dagi to‘lg‘ama termini o‘rta asr turkiy harbiy tafakkurining o‘ziga xos birligini ifodalaydi. Uning semantik tuzilishida dushman qanotini aylanib o‘tish harakati, shu vazifaga tayinlangan harbiy guruh hamda yaxlit jangovar taktika ma’nolari mujassam. Leyden-Erskin transliteratsiya va izohlash orqali terminning milliy shaklini ko‘proq saqlagan; Beverij tavsifiy tarjima yordamida harakat mohiyatini yoritgan; Tekston esa zamonaviy funksional ekvivalentlar orqali mazmunni ingliz o‘quvchisiga aniqroq yetkazgan. Biroq tavsifiy va funksional muqobillar qo‘llangan holatlarda terminologik yaxlitlik hamda tarixiy-madaniy semalar qisman zaiflashadi. Shu bois tarixiy harbiy terminlarni tarjima qilishda transliteratsiya, qisqa izoh va kontekstual funksional ekvivalentni uyg‘unlashtirish maqsadga muvofiqdir.

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TERMINOLOGY STANDARDIZATION IN SIMULTANEOUS INTERPRETING AT INTERNATIONAL DENTAL FORUMS

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Abstract: *International dental forums require simultaneous interpreting to enable communication among specialists from diverse linguistic backgrounds. Dental terminology creates significant challenges due to technical complexity and rapid development. This narrative review analyzes research on conference interpreting, cognitive processes, medical interpreting errors, and international dental terminology systems. Findings show that standardized vocabularies and terminology preparation improve consistency, reduce cognitive load, and decrease terminology-related errors. Standards such as ISO 3950, SNODENT, CDT, and ISO/TC 106 support the creation of reliable terminology resources for interpreters. Integrating standardized dental terminology into training can enhance simultaneous interpreting quality and promote effective multilingual scientific communication in dentistry.*

Keywords: *simultaneous interpretation; dental terminology; terminology standardization; conference interpreting; cognitive load; ISO 3950; SNODENT*

INTRODUCTION

International dental congresses depend on simultaneous interpretation to allow full scientific participation across language groups. Dentistry layers complex procedural, material, and digital nomenclature onto general medical vocabulary alongside coexisting tooth-notation systems. Unfamiliar terminology increases cognitive load and error rates during simultaneous interpreting, as interpreters operate close to processing-capacity saturation [1]. This review analyzes studies on simultaneous interpreting, dental terminology, and international terminology standards to determine how terminology standardization improves interpreting quality.

METHOD

A narrative literature review was conducted using publications on conference interpreting, medical interpreting, dental terminology, and international standards (ISO 3950, SNODENT, CDT). The collected studies were analyzed descriptively.

RESULTS

Dentistry possesses several formally codified terminology and notation systems that coexist with regional variation. The FDI two-digit tooth notation (ISO 3950) is used worldwide [2] except in the US, which relies on the Universal Numbering System [3]. Consequently, interpreters must reconcile these coexisting systems in real time unless one is agreed upon in advance. SNODENT was developed to standardize dental diagnostic terminology and provides standardized terminology for dental diagnosis and electronic health records [4]. Dental procedures are standardized through the ADA Current Dental Terminology (CDT) [5]. ISO/TC106 develops international standards for dental materials, instruments, and terminology [6].

According to Gile's Effort Models, simultaneous interpreting requires high cognitive effort, and unfamiliar terminology increases processing load and the likelihood of interpreting errors [1,7].

Research directly examining terminology preparation supports a causal mechanism linking preparation to performance. Previous studies indicate that glossary preparation reduces cognitive load, improves interpreter confidence, and increases interpreting accuracy. AIIC also recommends systematic terminology preparation before conferences [8,9]. Although dentistry-specific interpreting studies are limited, medical interpreting research shows that professional interpreters make substantially fewer terminology-related errors than untrained interpreters [10].

DISCUSSION

The reviewed studies consistently demonstrate that terminology standardization reduces cognitive load and improves interpreting accuracy. Existing international standards such as ISO 3950, SNODENT, CDT, and ISO/TC106 provide an effective basis for preparing interpreters before international dental conferences.

CONCLUSION

Evidence from cognitive models of interpreting, empirical terminology-preparation research, and clinical interpreting-error studies converges on the conclusion that standardized, pre-established terminology is a measurable determinant of interpreting accuracy rather than a matter of stylistic preference. Dentistry's complex, evolving terminology makes standardization critical. Dental forums must leverage existing standards (ISO 3950, SNODENT, CDT, ISO/TC106) to systematically prepare interpreting teams, and doing so is supported by the interpreting-science and clinical-interpreting evidence reviewed here — pending direct empirical confirmation in the congress-interpreting setting itself.

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THE LAYERED NATURE OF THE UZBEK VOCABULARY: HISTORICAL FORMATION OF WORD STOCK AND SEMANTIC NUANCES

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***Abstract**: This article analyzes the specific patterns of the formation of the Uzbek vocabulary, its rich layers, and the differential features that distinguish it from other languages. Based on precise linguistic evidence, the study highlights the Turkic core of the Uzbek vocabulary, the synonymy system resulting from centuries-old contacts with Arabic and Persian languages, the phonetic-lexical nature of the vowel harmony (synharmonism) phenomenon, and their functional distribution in speech.*

***Keywords**: Vocabulary, lexical layers, synharmonism, vowel system, Qarluq dialect, synonymy, dialectal symbiosis.*

INTRODUCTION:

The vocabulary of any language serves as a mirror reflecting not only the past of the people who speak it but also their lifestyle at historical, cultural crossroads. As the Uzbek folk proverb wisely states, "**He who knows a language knows the world**" ("**Til bilgan — el bilar**"). The vocabulary of the literary Uzbek language holds a unique position in world linguistics due to its structural formation. Although it belongs to the Qarluq group of the Turkic language family, as a result of long-standing socio-cultural relations, it has developed individual characteristics that distinguish it from other related languages (Hojiyev, 1999).

As Alisher Navoiy, the founder of the Old Uzbek language, emphasized, the internal potential of this language is so vast that it is capable of precisely expressing the most delicate nuances of the human soul. The purpose of this article is to scientifically substantiate the unique phonetic and lexical identity of

the Uzbek vocabulary by comparing it with other languages, particularly related Turkic languages.

1. **Dialectal Symbiosis**: The Unification of Qarluq, Qipchoq, and Oghuz Elements

2. The first important factor distinguishing the Uzbek vocabulary from other Turkic languages is the extraordinary complexity and diversity of its dialectal base. While Kazakh, Kyrgyz, or Turkmen languages have a relatively monolithic dialectal basis (belonging to the Qipchoq or Oghuz groups), the literary Uzbek language has accumulated the finest words from three major dialect groups (Reshetov & Shoabdurahmonov, 1978).

This situation is clearly visible in the naming system of daily life. For instance, in expressing lifestyle and natural phenomena, Qarluq (sedentary-urban) and Qipchoq (nomadic-steppe) elements exist in parallel, thereby enriching the vocabulary of the language ("*Explanatory Dictionary of the Uzbek Language*", *2006*):

Concept	Qarluq Layer (Literary)	Qipchoq/Oghuz Variant
Kinship Relation	Tog‘a (Maternal uncle)	Tog‘o/Dayi
Waterway	Ariq (Irrigation ditch)	Yap/Bo‘qoq
Aesthetic Feature	Chiroyli/Go‘zal (Beautiful)	Suluv/Olamshumul

This abundance has created conditions for expanding the synonymous potential of the Uzbek language boundlessly. Alisher Navoiy, in his fundamental work "*Muhokamatul-lug‘atayn*" (*The Trial of the Two Languages*), proved the richness of the Turkic language, particularly in its verbs and types of actions, through these exact internal capabilities (Navoiy, 2003). The author substantiated that the Turkic language was by no means inferior to Persian by citing more than a hundred specific verbs unique only to the Turkic language. Mahmud Koshg‘ariy also noted in his fundamental encyclopedia that the word-formation system of the Qarluq and Chigil dialects is remarkably adaptive (Koshg‘ariy, 1960).

2. The Phenomenon of Vowel Harmony (Synharmonism) and its Lexical Impact in the Uzbek Language Vowel harmony (synharmonism)—the law where vowels within a word are consistently either back or front—which is one of the main characteristics of Turkic languages, has undergone a unique evolutionary path in the literary Uzbek language. Prominent dialectologists V. Reshetov and B. To‘ychiboyev proved through concrete evidence in their research that the phenomenon of synharmonism in the Uzbek language is not monolithic but rather regional in character (Reshetov & Shoabdurahmonov, 1978; To‘ychiboyev, 2011).

In Uzbek linguistics, the phenomenon of synharmonism is analyzed in two ways:

Dialects with Synharmonism (Qipchoq dialects):Vowel harmony is strictly preserved mainly in rural areas where the influence of Qipchoq dialects is strong. For example, the literary word “**keladi**” (**comes**) is pronounced with front vowel harmony (**keldi** / **kelti**) in these dialects, while the word “**bordi**” (**went**) is pronounced with back vowel harmony (To‘ychiboyev, 2011).

Dialects without Synharmonism (Qarluq-Chigil dialects): In ancient urban and sedentary dialects such as Tashkent, Fergana, Samarkand, and Bukhara, the contrast between front and back vowels weakened or disappeared entirely as a result of centuries of vibrant social interaction with Iranian (Tajik) languages. The modern literary Uzbek language is built precisely on the basis of these urban (Qarluq) dialects that lost their synharmonism (Baskakov, 1969). This phonetic state granted immense freedom to the vocabulary of the language:Preservation of words in their original form: The Uzbek language does not distort the shape of new loanwords in an attempt to adapt them to its own sound system. For example, while the Kazakh language adapted the Russian word “**krovat**” (**bed**) into kerauat and the Kyrgyz language into **kervat**, the Uzbek language, due to its nature free from strict synharmonism, can accept international terms like krovat, **kompyuter** (**computer**), **ijtimoiy** (**social**), or **iqtisodiyot** (**economy**)

very close to their original phonetic forms. This makes the Uzbek language one of the most tolerant and convenient languages for adopting global scientific and technical vocabulary (Hojiyev, 1999).

3. The Influence of Arabic and Persian Languages and Functional Distribution When discussing the uniqueness of the Uzbek vocabulary, it is often superficially mentioned that it merely borrowed words from external sources. However, the primary difference lies not just in borrowing words, but in the adaptation of those borrowed words to Uzbek thought patterns and their functional division based on semantic nuances (Rahmatullayev, 2000). In the Uzbek language, the pure Turkic core, Persian poetic elegance, and Arabic academic precision form such a beautiful harmony that it is difficult to find a parallel in any other language.

Evidence and Analysis: Let us examine the words related to the concept of "Thinking". In Uzbek speech, there exist the words O'ylamoq (Turkic – action and process), Fikr qilmoq (Arabic – logical conclusion), and Andisha qilmoq (Persian – moral consideration and modesty) (Rahmatullayev, 2000). These words cannot completely replace one another; rather, they manifest different levels of human inner experiences. The renowned linguist Ayub G'ulomov demonstrated in his research that the lexical wealth of a language is measured not by the absolute number of its words, but by the abundance of semantic shades (nuances) within those words (G'ulomov, 1965). The synonymous series of dozens of words in the Uzbek language for smiling and laughing, such as kulimsirash, jilmoyish, tabassum, iljayish, tirjayish, stands as clear proof of how precisely we can depict human emotions.

4.Communication Culture and Kinship Vocabulary The purely Eastern aspect of the Uzbek vocabulary, which fundamentally differs from Western languages (English, German, French), is the highly branched system of social relations, respect, and kinship terms. The folk proverb **"A bird does what**

it sees in its nest" ("**Qush uyasida ko'rganini qiladi**") relates directly to the linguistic reflection of family and social relationships.

Since generalism plays a major role in Western thought, words tend to carry broader meanings. For instance, the English word brother refers to an older or younger brother regardless of age, and uncle means either a paternal or maternal uncle. In the Uzbek lexical worldview, however, age and kinship ties are clearly demarcated ("Explanatory Dictionary of the Uzbek Language", 2006):

Uzbek Communication and Kinship System

Age Direction:	Age Distinction:	Level of Respect:
Amaki (Paternal uncle) / Tog'a (Maternal uncle)	Aka (Older brother) / Uka (Younger brother),	Sizlash (Formal 'You' - modesty/ethics) / Senlash (Informal 'You' - closeness)
	Opa (Older sister) / Singil (Younger sister)	

CONCLUSION

The observations and linguistic analyses conducted show that the vocabulary of the literary Uzbek language is historically rich, adaptive, and a multi-layered system by nature. The main aspects that distinguish it from other languages in the world and from related Turkic languages are the synthesis of three major dialect groups built upon a solid Turkic foundation, the wise distribution of borrowed Arabic and Persian words into functional tasks according to semantic nuances, and the capability to express human relationships with high ethics. The weakening of the law of synharmonism in urban dialects, thoroughly studied by scholars like V. Reshetov and B. To'ychiboyev, brought a unique elasticity to our literary language. This feature has given the Uzbek language the capacity to adopt international scientific and technical vocabulary without damaging its structural form. The rich and flexible nature of the Uzbek

language has ensured its survival over the centuries without losing its identity, and it establishes a full foundation for its parallel development in the modern global information space in the future.

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MATNLI KOMPETENSIYANI RIVOJLANTIRISH TAJRIBASI VA AMALIY TAVSIYALAR

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Annotatsiya. *Ushbu maqolada o‘quvchilarda matnli kompetensiyani shakllantirish va rivojlantirishning nazariy asoslari hamda amaliy tajribalari yoritilgan. Matnli kompetensiya — o‘quvchining matnni tushunish, tahlil qilish, qayta ishlash va mazmun yaratish jarayonlarida til vositalaridan ongli foydalanish qobiliyati sifatida talqin etiladi. Tadqiqotda ushbu ko‘nikmani rivojlantirishga doir mahalliy va xorijiy tajribalar o‘rganilib, ularning samarali jihatlari tahlil qilingan.*

Kalit so‘zlar: *matnli kompetensiya, matn tahlili, funksional savodxonlik, nutq rivoji, yozma nutq, metodik yondashuv, o‘quv jarayoni, innovatsion usullar, til kompetensiyalari, o‘qish ko‘nikmalari.*

Аннотация. *В данной статье раскрываются теоретические основы и практический опыт формирования и развития текстовой компетенции у учащихся. Текстовая компетенция трактуется как способность обучающегося осознанно использовать языковые средства при понимании, анализе, переработке текста и создании содержания. В исследовании изучены отечественный и зарубежный опыт по развитию данной компетенции, проанализированы их эффективные аспекты.*

Ключевые слова: *текстовая компетенция, анализ текста, функциональная грамотность, развитие речи, письменная речь, методический подход, учебный процесс, инновационные методы, языковые компетенции, навыки чтения.*

Abstract. *This article explores the theoretical foundations and practical approaches to developing textual competence in students. Textual competence is defined as a learner’s ability to consciously use linguistic means while understanding, analyzing, processing texts and creating coherent content. The study examines national and international practices aimed at enhancing this competence and analyzes their effective aspects.*

Keywords: *textual competence, text analysis, functional literacy, speech development, writing skills, methodological approach, educational process, innovative techniques, language competences, reading skills.*

KIRISH

Bugungi globallashuv va raqamli axborot oqimi jadal kuchayib borayotgan bir davrda o‘quvchilarning matn bilan ishlash ko‘nikmalarini rivojlantirish ta’limning ustuvor vazifalaridan biriga aylanmoqda. Axborotni izlash, tanlash, baholash, tahlil qilish va qayta ishlab, mustaqil mazmun yaratish qobiliyati funksional savodxonlikning asosiy komponentlaridan bo‘lib, uning markazida matnli kompetensiya turadi. Matnli kompetensiya o‘quvchilarning o‘qish va yozish faoliyatini samarali tashkil etish, fikrni mantiqan bayon etish, til vositalaridan ongli ravishda foydalanish va mustaqil tahliliy yondasha olish imkonini beradi.

So‘nggi yillarda davlat ta’lim standarti, o‘quv dasturlari, xalqaro baholash dasturlari (PISA, PIRLS) talablari ham o‘quvchilarning matn bilan ishlash malakalarini chuqurlashtirishni taqozo etmoqda. Xususan, murakkab matnlarni tushunish, ma’lumotlar o‘rtasidagi bog‘liqlikni aniqlash, matn mazmunidan yangi xulosalar chiqarish kabi ko‘nikmalar o‘quvchining nafaqat til va adabiyot fanlaridagi, balki barcha o‘quv predmetlaridagi muvaffaqiyatining muhim omili sifatida namoyon bo‘lmoqda.

Shu bois, matnli kompetensiyani rivojlantirish bo‘yicha mahalliy va xorijiy tajribalarni tahlil qilish, samarali metod va texnologiyalarni amaliyotga joriy etish ta’lim sifatini oshirishning dolzarb yo‘nalishidir. Ushbu maqolada matnli kompetensiyani shakllantirishning nazariy asoslari, o‘qituvchining metodik yondashuvi, amaliy mashg‘ulotlar samaradorligini ta’minlovchi usullar hamda o‘quvchilarning yosh va psixologik xususiyatlariga mos tavsiyalar yoritiladi.

Materiallar va metodlar. Ushbu tadqiqotda boshlang‘ich sinf o‘quvchilarining matnli kompetensiyasini rivojlantirishga oid ilmiy-nazariy manbalar, monografiyalar, maqolalar va xalqaro ta’lim dasturlari (PISA, PIRLS) materiallari tahlil qilindi.

Tahlil jarayonida **kontent-tahlil**, **qiyosiy tahlil** va **tizimlashtirish** metodlaridan foydalanildi. Kontent-tahlil orqali ilmiy manbalarda qo‘llanilgan asosiy tushunchalar (matnli kompetensiya, o‘qish savodxonligi, nutqiy rivojlanish) aniqlanib, ularning mohiyati izohlandi. Qiyosiy tahlil yordamida turli mualliflarning qarashlari solishtirilib, umumiy tendensiyalar belgilandi. Natijada, matnli kompetensiyani rivojlantirish metodikasining nazariy modeli ishlab chiqish uchun asos yaratildi.

Natijalar va muhokama. Ilmiy adabiyotlarda «matn kompetensiyasi» tushunchasining talqinlari bir xil emas, bu esa ushbu sohada nazariy umumlashmalarni amalga oshirishni qiyinlashtiradi.

Ona tilini bilish darajasini belgilovchi kompetensiyalar qatoriga, odatda, quyidagilar kiritiladi: kommunikativ, til (yoki lingvistik), madaniyatshunoslik va matn kompetensiyalari. Keling, ushbu kompetensiyalarning har birini batafsil ko‘rib chiqamiz hamda matn kompetensiyasining qolgan “filologik” kompetensiyalar tizimidagi o‘rnini aniqlashga harakat qilamiz.

“Kompetensiya” atamasi N. Xomsky tomonidan qo‘llangan bo‘lib, u birinchi bo‘lib til kompetensiyasi haqida so‘z yuritgan va uni so‘zlovchiga nafaqat nutq yaratish, balki to‘g‘ri shakllangan nutqiy ifodalarni tanib olish imkonini beruvchi tug‘ma bilim sifatida ta’riflagan [10]. Tadqiqotchining fikricha, til kompetensiyasi (keng ma’noda) – bu “aqliy qobiliyatlar tizimi, bilimlar va e’tiqodlar tizimi bo‘lib, u erta bolalik davrida shakllanadi va ko‘plab boshqa omillar bilan o‘zaro ta’sirda shaxsning xulq-atvor turlarini belgilaydi” [11].

N. Xomsky g‘oyalarini davom ettirgan etnolingvist D. Xayms “kommunikativ kompetensiya” atamasini ilmiy muomalaga kiritadi va uni nutq faoliyatida ishtirok etish qobiliyati, tilning situativ mosligini ichki bilish sifatida talqin qiladi [11].

Lingvodidaktikada «kommunikativ kompetensiya» atamasini ilmiy muomalaga M.N. Vatyutnev kiritgan. Tadqiqotchi ikki tur kompetensiyani

ajratadi: til kompetensiyasi va kommunikativ kompetensiya. Til kompetensiyasini u chuqur til tuzilmalarini tashkil etuvchi qoidalar majmuasining intuitiv tarzda egallangan bilimlari sifatida izohlaydi; mazkur qoidalar muloqot jarayonida turli nutqiy ifodalarga aylantiriladi [2]. M.N. Vatyutnevning fikricha, kommunikativ kompetensiya – «insonning muayyan muloqot vaziyatiga moslasha olish qobiliyatiga qarab nutqiy xulq-atvor dasturlarini tanlash va amalga oshirish; vaziyatlarni mavzu, maqsadlar, kommunikativ ustanovkalar asosida tasniflay olish ko‘nikmasi, bu ustanovkalar suhbat boshlanishidan oldin ham, suhbat davomida o‘zaro moslashuv jarayonida ham yuzaga keladi» [2].

O‘zbek tili o‘qitish metodikasining zamonaviy bosqichi O‘zbek tilini milliy madaniyatga jalb etish vositasi sifatida o‘rgatishga bo‘lgan e’tiborning ortishi bilan xarakterlanadi. Tilni bunday yondashuv asosida o‘rganish madaniyatshunoslik kompetensiyasini rivojlantiradi. Madaniyatshunoslik kompetensiyasiga shuningdek, ona tiliga xos bo‘lgan noverbal muloqot vositalarini (mimika, jestlar) bilish ham kiradi.

Madaniyatshunoslik kompetensiyasini shakllantirishda badiiy adabiyot matni alohida ahamiyatga ega bo‘lib, u o‘quvchilarning ma’naviy va estetik tarbiyasini, nutqiy muloqotga o‘rgatishni amalga oshirishning eng samarali vositalaridan biri hisoblanadi. Chunki badiiy matnda til vositalari orqali til egalarining moddiy-ma’naviy dunyosi ifoda etiladi va u til bilan madaniyat o‘rtasidagi vositachi sifatida namoyon bo‘ladi.

O‘quvchilarda yuqorida sanab o‘tilgan «filologik» kompetensiyalarni shakllantirish turli janrdagi matnlarni yaratish, aytish, qabul qilish, tushunish va talqin qilish bilan bog‘liq matn faoliyati jarayonida amalga oshiriladi. Matnning tuzilish qonuniyatlarini, uning turli turlarini bilish, ularning xos belgilarini ajrata olish o‘quvchilarning kommunikativ kompetensiyasini rivojlantirish uchun muhimdir. Bunday kompetensiya esa faqat matn darajasida shakllanishi

mumkin. Shu bois biz matn kompetensiyasini alohida kompetensiya sifatida ajratishni asosli deb hisoblaymiz.

Hozirgi zamon matnshunosligi va nutqshunosligi bo‘yicha tadqiqotchilar matn kompetensiyasini bir tomondan, mustaqil kategoriya sifatida, ikkinchi tomondan esa kommunikativ kompetensiyaning tarkibiy qismi sifatida talqin qiladilar. Bu esa matnni o‘rganishda kommunikativ yondashuv ustuvorligi bilan bog‘liq. I.V. Salosina fikricha, «filologik» kompetensiyalarning barchasi qisman o‘zaro kesishadi. Ularning shakllanishi va rivojlanishi bir vaqtning o‘zida kechadi: masalan, zamonaviy til me’yorlarini bilmasdan matn qurilishi asoslarini o‘zlashtirish mumkin emas [7].

Demak, matn kompetensiyasini rus tilini egallash darajasini belgilovchi mustaqil kategoriya sifatida ko‘rib chiqish lozim.

Matn faoliyati turini, shaklini va mazmunini tanlash hamda muloqot vaziyati, kommunikativ soha va muloqot ishtirokchilari bilan uning uzviy bog‘liqligini hisobga olgan holda, matn kompetensiyasining shakllanishi filologik, pedagogik va psixologik tarkibiy qismlarni o‘z ichiga olgan integrativ jarayon ekanini taxmin qilish mumkin. Ushbu integrativ jarayonning asosiy ko‘rsatkichi – til va kommunikativ kompetensiyalarning o‘zaro bog‘liqligidir

Matn kompetensiyasi til kompetensiyasiga tayanadi va o‘z navbatida kommunikativ kompetensiyaning shakllanishini belgilaydi. Kommunikativ kompetensiya tilga oid bilim, ko‘nikma, malaka va tayyorgarliklarga asoslanadi. Nutqning to‘g‘riligi va aniqligi muloqotning samaradorligini ta’minlaydi. Til kompetensiyasi esa matn faoliyatining barcha turlari uchun zarur bo‘lgan shart-sharoitlarni yaratadi. Ushbu kompetensiyalarning har biri o‘quvchilarning fikrlash jarayonini rivojlantirishni talab qiladi. Bunday rivojlanish esa matn bilan tizimli ishlash orqali, ya’ni o‘quvchilarda tahliliy va sintetik fikrlash ko‘nikmalarini shakllantirish orqali ta’minlanadi.

Shu bilan birga, unutmaslik kerakki, matn — matn kompetensiyasining yakuniy mahsuli sifatida — nutqiy kommunikatsiyaning asosiy vositasidir. U

tildagi birlik ham, nutqdagi birlik ham hisoblanadi. Til birligi sifatida matn uning yaxlitligi va izchilligini ta’minlovchi til tizimi vositalari orqali quriladi. Nutq birligi sifatida esa u nutqiy faoliyat mahsulidir. Demak, uch kompetensiyaning o‘zaro aloqasi mavjud bo‘lib, matn kompetensiyasi shaxsning integrativ sifati, ya’ni uning nutqiy va pedagogik madaniyati rivojlanishining ko‘rsatkichi sifatida namoyon bo‘ladi.

Kommunikativ, til va matn kompetensiyalari ijtimoiy ahamiyatga ega bo‘lib, okulturatsiya (ona madaniyatini o‘zlashtirish) va akkulturatsiya (begona madaniyatni o‘zlashtirish) vositalari sifatida xizmat qiladi. Ushbu uch segmentning birikuvi nutq madaniyatini shakllantirish sohasini tashkil etadi. Bu soha muloqot vaziyati, sohasi va maqsadlariga muvofiq ravishda til imkoniyatlaridan samarali foydalanish ko‘nikmasini nazarda tutadi. Matn kompetensiyasini shakllantirish bo‘yicha maqsadli ishlar til kompetensiyasini yanada rivojlantirish va chuqurlashtirish uchun keng imkoniyatlar yaratadi.

M.Ya. Dymarskiy til kompetensiyasi va matn kompetensiyasini farqlab, matn kompetensiyasi tilni o‘rganish jarayonida avtomatik tarzda emas, balki maxsus shakllanuvchi ko‘nikmalar majmuasiga qaratilganini ta’kidlaydi. U matn kompetensiyasini madaniy-yozma an’analarining og‘zaki belgilangan me’yorlariga mos keladigan matnlarni yaratishni ta’minlaydigan bilim va ko‘nikmalar majmui sifatida talqin qiladi, ya’ni matn yaratish me’yoriga egalik sifatida izohlaydi [4].

M.Ya. Dymarskiy taklif qilgan matn kompetensiyasining tuzilishi uch asosiy komponentdan iborat ierarxiya shaklida namoyon bo‘ladi. Birinchi komponent — matnni tahlil qilish va uning qismlarini ajratish qobiliyati — olim tomonidan matn mavzusini aniqlash, uni kichik mavzularga ajratish va ular o‘rtasidagi ierarxiyani belgilash ko‘nikmasi sifatida talqin qilinadi.

Ikkinchi komponent — matnning izchilligini ta’minlash — mazmun elementlari o‘rtasida bog‘lanish hosil qiluvchi til vositalaridan foydalanish qobiliyatini anglatadi. Bu matn yaratuvchisiga o‘quvchi tomonidan butunning

adekvat tarzda qabul qilinishini ta’minlaydi. M.Ya. Dymarskiy matndagi bog‘liqlik vositalarini ikki guruhga ajratadi:

1. **Universal vositalar** – mazkur tilning har qanday nutqiy-mafkuraviy asarida ishlatiladigan birliklar (bog‘lovchilar, olmoshlar, sintaktik to‘liqsizlik, sintaktik parallelizm, kesim fe’llarining tur-vaziyat shakllari);
2. **Matnga xos bog‘lovchi vositalar** – yozma shakldagi nutqda uchraydigan maxsus birliklar: matnga xos bog‘lovchi so‘zlar va bog‘lovchi konstruktsiyalar.

Aynan ushbu ikkinchi guruh matnning nafaqat izchilligini, balki o‘quvchi tomonidan to‘liq va adekvat idrok etilishini ta’minlaydi.

Uchinchi komponent — yaxlit matn yaratish ko‘nikmasi — birinchi va ikkinchi komponentlar o‘rtasidagi bog‘lovchi bo‘g‘in sifatida qaraladi va janr-stilistik hamda til vositalaridan foydalanish malakasini talab qiladi. Shunday qilib, matn kompetensiyasini shaxsning integrativ ko‘rsatkichi sifatida talqin qilish mumkin; u nutqiy kompetensiyani (birinchi ikki komponent) va til kompetensiyasini (uchinchi komponent) o‘z ichiga oladi [4].

XULOSA

Tadqiqot natijalari shuni ko‘rsatadiki, matnli kompetensiyani rivojlantirish o‘quvchilarning o‘qish, yozish va mantiqiy fikrlash ko‘nikmalarini sezilarli darajada oshirishga xizmat qiladi. Matnli kompetensiya faqat til va adabiyot fanlarida emas, balki boshqa fanlar bo‘yicha ham o‘quvchilarning bilimlarini mustahkamlash, mustaqil tahlil va xulosa chiqarish qobiliyatini rivojlantirishning muhim omili hisoblanadi.

Shu bilan birga, matnli kompetensiyani tizimli rivojlantirish jarayoni o‘qituvchining metodik yondashuvi, darsdagi materiallarning turli-tumanligi va amaliy mashqlar samaradorligiga bog‘liq. Tadqiqot natijalari o‘quv jarayonida matn bilan ishlashni tizimli tashkil etish o‘quvchilarning akademik va ijodiy ko‘nikmalarini samarali rivojlantirishga xizmat qilishini tasdiqlaydi.

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EKZISTENSIALIZM FALSAFASINING TA'LIM VA IJTIMOIY ISH NAZARIYASIDAGI O'RNI: SHAXSIY AGENTLIK, ERKINLIK VA MAS'ULIYAT MASALALARI

Radjabova Madina Rahim qizi

Buxoro davlat universiteti, 10.00.04 – Yevropa, Avstraliya va Amerika xalqlari tili va adabiyoti yo'nalishi tayanch doktoranti

Annotatsiya. *Mazkur maqolada XX asr falsafasining yirik oqimlaridan biri bo'lgan ekzistensializmning zamonaviy ta'lim falsafasi va ijtimoiy ish nazariyasidagi tutgan o'rni tahlil qilinadi. Jan-Pol Sartr, Simone de Bovuar va Martin Xaydegger g'oyalari misolida individual agentlik, erkinlik, tanlov va autentiklik tushunchalarining ta'lim jarayonini insonparvarlashtirishdagi ahamiyati yoritiladi. Shuningdek, ekzistensialistik tamoyillarning ijtimoiy xodim va mijoz o'rtasidagi munosabatlarda, guruh ichidagi o'zaro ta'sirda hamda kasbiy axloqiy mas'uliyatni anglashda qanday amaliy ahamiyat kasb etishi ko'rib chiqiladi. Tadqiqot ekzistensializm merosining zamonaviy gumanitar va ijtimoiy fanlar uchun mustahkam nazariy-uslubiy asos bo'la olishini asoslaydi.*

Kalit so'zlar: *ekzistensializm, individual agentlik, erkinlik, tanlov, mas'uliyat, autentiklik, ta'lim falsafasi, ijtimoiy ish, "olamda-borliq".*

Abstract. *This article examines the role of existentialism, one of the major philosophical movements of the twentieth century, in contemporary educational philosophy and social work theory. Drawing on the ideas of Jean-Paul Sartre, Simone de Beauvoir, and Martin Heidegger, it explores the significance of such concepts as individual agency, freedom, choice, and authenticity in the humanization of the educational process. The study also discusses the practical relevance of existentialist principles in the relationship between social workers and clients, group interactions, and the understanding of professional ethical responsibility. It argues that the legacy of existentialism provides a robust theoretical and methodological foundation for contemporary humanities and social sciences.*

Keywords: *existentialism, individual agency, freedom, choice, responsibility, authenticity, philosophy of education, social work, "*being-in-the-world".

KIRISH

XX asrning birinchi yarmida Yevropa falsafiy tafakkurida shakllangan ekzistensializm oqimi insonning mavjudligi, erkinligi va shaxsiy tanlovi masalalarini markazga qo‘yadi. Ushbu falsafiy yo‘nalishning negizida yotuvchi asosiy g‘oyaga ko‘ra, inson avvalo mavjud bo‘ladi, so‘ngra o‘z mohiyatini shaxsiy tanlovlari orqali yaratadi. Bugungi kunda ekzistensialistik g‘oyalar nafaqat falsafa doirasida, balki pedagogika, psixologiya va ijtimoiy ish kabi amaliy-gumanitar sohalarda ham qayta talqin qilinmoqda. Zero, zamonaviy ta’lim tizimi va ijtimoiy xizmat amaliyoti oldida turgan asosiy vazifalardan biri – insonni passiv obyekt sifatida emas, balki o‘z hayotini mustaqil quruvchi faol subyekt sifatida tarbiyalash va qo‘llab-quvvatlashdan iboratdir. Mazkur maqolada ekzistensializmning uchta yetakchi vakili – Jan-Pol Sartr, Simone de Bovuar va Martin Xaydegger g‘oyalari asosida ushbu falsafiy oqimning ta’lim falsafasi hamda ijtimoiy ish nazariyasidagi amaliy ahamiyati tahlil qilinadi.

1. SARTR VA DE BOVUAR TA’LIMOTIDA INDIVIDUAL AGENTLIK G‘OYASI

Ekzistensialistik tafakkurning markazida shaxsning o‘z hayotini mustaqil belgilash huquqi va qobiliyati, ya’ni “individual agentlik” g‘oyasi turadi. Bu tushuncha, avvalo, Jan-Pol Sartr ijodida chuqur falsafiy asoslanishga ega bo‘lgan [1]. Sartrning inson erkinlikka “mahkum etilgani” haqidagi mashhur ta’kidi shaxsning o‘z kimligi va mavjudligini belgilovchi tanlovlar oldidagi mas’uliyati naqadar og‘ir ekanini yorqin ifodalaydi. Ushbu qarashni ta’lim sohasiga tatbiq etadigan bo‘lsak, shu narsa ayon bo‘ladiki, o‘quv dasturlari faqat tayyor bilimlarni uzatish vositasi bo‘lib qolmasligi, balki talabani o‘z ta’lim jarayonining faol ishtirokchisiga aylantirishi zarur. Tanqidiy fikrlash ko‘nikmalarini shakllantirish va o‘quv materialini shaxsiy hayotiy tajriba bilan bog‘lash orqali pedagog talabani o‘z e’tiqodi, intilishlari va hayotiy dilemmalari bilan ochiq yuzlashuvga undaydigan muhitni yaratishi mumkin.

Simone de Bovuar esa ekzistensializm g‘oyalarini gender nuqtayi nazaridan boyitib, erkinlikni insonning tabiiy va ajralmas xususiyati sifatida

talqin qildi [2]. Uning qarashlari ta’lim amaliyotida gender tajribalarini hisobga olish, shuningdek, har bir o‘quvchining o‘ziga xos ijtimoiy-madaniy kelib chiqishiga sezgirlik bilan yondashish zarurligini ko‘rsatib beradi. Bunday inklyuziv yondashuv o‘quvchilarga o‘z hikoyasini erkin bayon etish va o‘ziga xos rivojlanish yo‘lini izlash imkonini beradi, bu esa ekzistensializmning autentiklik va xilma-xil identifikatsiyalarni tan olish tamoyillari bilan uyg‘un keladi.

2. MARTIN XAYDEGGERNING “OLAMDA-BORLIQ” VA AVTENTIKLIK KONSEPSIYASI TA’LIM JARAYONIDA

Ekzistensialistik falsafaning yana bir yirik vakili Martin Xaydegger “borliq” muammosi va shaxsning avtentik mavjudligi masalalariga alohida e’tibor qaratgan [3]. Uning “olamda-borliq” konsepsiyasiga ko‘ra, inson mavjudligi undan tashqarida turgan olam bilan uzviy va mazmunli aloqada namoyon bo‘ladi. Ushbu g‘oyani ta’lim nazariyasi nuqtayi nazaridan sharhlaydigan bo‘lsak, ta’lim jarayoni o‘quvchida shunchaki nazariy bilim emas, balki atrof-muhit, jamiyat va o‘z-o‘zi bilan chuqur, mazmunli munosabat shakllantirishi lozimligi ayon bo‘ladi. Shu sababli, Xaydegger merosidan kelib chiqqan holda, pedagoglarga tajribaga asoslangan ta’lim shakllarini – amaliy loyihalar, dala tadqiqotlari, jamoat bilan hamkorlikdagi ishlarni – qo‘llab-quvvatlash tavsiya etiladi, chunki bunday yondashuv o‘quvchiga olam bilan bevosita va shaxsiy aloqa o‘rnatish imkonini beradi. Natijada ta’lim muassasasi shunchaki bilim uzatish maskani emas, balki o‘quvchi o‘zining mavjudlik mohiyati va olamdagi o‘rni haqida mushohada yurituvchi jonli intellektual makonga aylanadi.

3. EKZISTENSIALIZM IJTIMOIY ISH NAZARIYASI VA AMALIYOTIDA

Ekzistensialistik tamoyillar zamonaviy ijtimoiy fanlarning ko‘plab yo‘nalishlarida, xususan, ijtimoiy ish amaliyotida katta ahamiyat kasb etmoqda. Shaxsiy mavjudlik, erkinlik va hayotiy ma’no izlash masalalarini markazga

qo‘yuvchi ekzistensialistik qarash ijtimoiy ishning kasbiy qadriyatlari – mijozning shaxsiyatini hurmat qilish, uning o‘z hayoti bo‘yicha qaror qabul qilish huquqini tan olish – bilan chambarchas bog‘liq. Amerikalik olim Donald Krill o‘zining “Existential Social Work” asarida aynan shu masalani chuqur yoritib, ekzistensial yondashuvning ijtimoiy xodim faoliyatidagi amaliy qo‘llanilishini asoslab bergan [4].

Ekzistensializmning markaziy g‘oyasiga ko‘ra, inson o‘z hayotining passiv kuzatuvchisi emas, balki faol subyektidir, uning mohiyati esa aynan shaxsiy tanlovlar zanjiri orqali shakllanadi. Ushbu qarash ijtimoiy ish amaliyoti uchun bevosita ahamiyatga ega, zero bu sohada mutaxassislar ko‘pincha o‘z identifikatsiyasi, avtonomiyasi va shaxsiy agentligi masalalarida qiynalayotgan mijozlar bilan ishlaydi. Ijtimoiy xodimning asosiy vazifasi – mijozni hayotiy vaziyatning murakkabliklarida yo‘l topishga ilhomlantirish va qo‘llab-quvvatlashdan iborat bo‘lib, bu vazifa ekzistensializmda markaziy o‘rin tutuvchi tanlov va mas’uliyat g‘oyalari bilan bevosita uyg‘unlashadi. Ekzistensial yondashuvni qo‘llaydigan mutaxassis mijozni o‘ziga xos erkinlikni anglashga hamda qabul qilingan qarorlar uchun mas’uliyatni chuqur his etishga undaydi, bu esa mijozning o‘z-o‘zini anglashi va autentik yashash tuyg‘usini mustahkamlashga xizmat qiladi.

Bundan tashqari, ekzistensial mavzular nafaqat individual maslahat jarayonida, balki guruh bilan ishlash va jamoa dinamikasini tahlil qilishda ham muhim o‘rin tutadi. Xaydeggerning “olamda-borliq” konsepsiyasida ifodalangan yolg‘izlik va jamiyatga mansublik o‘rtasidagi dialektik uyg‘unlik g‘oyasi bu borada nazariy asos bo‘lib xizmat qiladi: inson bir vaqtning o‘zida ham yakka shaxs, ham ijtimoiy mavjudot sifatida namoyon bo‘ladi, ijtimoiy xodimning vazifasi esa aynan shu ikki qutb o‘rtasidagi muvozanatni topishda mijozga yordam berishdan iboratdir.

XULOSA

Xulosa qilib aytganda, ekzistensializm inson mavjudligining eng chuqur qatlamlarini tadqiq etuvchi falsafiy oqim sifatida, bugungi kunda ham axloqiy tafakkur uchun mustahkam va izchil nazariy asos bo‘lib xizmat qilmoqda. Ekzistensializmning axloqiy oqibatlari “mavjudlik mohiyatdan oldin keladi” tamoyili, radikal erkinlik g‘oyasi hamda ular bilan uzviy bog‘liq shaxsiy mas’uliyat yukidan kelib chiqadi. Ushbu fundamental tamoyillar an’anaviy axloqiy tizimlarga muqobil bo‘lgan o‘ziga xos etik makonni shakllantirib, individual agentlik, autentiklik va qadriyatlarning subyektiv tabiati haqidagi tasavvurlarni qayta ko‘rib chiqishga undaydi. Ta’lim va ijtimoiy ish sohalarida ekzistensialistik merosdan oqilona foydalanish talabalar va mijozlarda shaxsiy erkinlik, tanqidiy fikrlash hamda ijtimoiy mas’uliyat tuyg‘usini mustahkam qaror toptirish uchun samarali konseptual asos bo‘lib xizmat qilishi mumkin. Kelgusi tadqiqotlarda ekzistensialistik tamoyillarning aniq pedagogik texnologiyalar va ijtimoiy ish metodikalari bilan integratsiyasi masalasi alohida chuqur o‘rganishni talab etadi.

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НАЦИОНАЛЬНО-СПЕЦИФИЧЕСКОЕ И УНИВЕРСАЛЬНОЕ В ИНТЕРПРЕТАЦИИ ВОСТОЧНЫХ МОТИВОВ В РУССКОЙ И УЗБЕКСКОЙ КЛАССИЧЕСКОЙ ЛИТЕРАТУРЕ

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Аннотация. *В данной работе рассматриваются восточные мотивы как важный художественный феномен в русской литературе XIX века и узбекской классической поэзии. Особое внимание уделяется выявлению универсальных и национально-специфических особенностей их интерпретации в произведениях русских романтиков и узбекских классиков. Анализ показывает, что в русской литературе Восток выступает как экзотическое и контрастное пространство, способствующее раскрытию внутреннего мира героя, тогда как в узбекской поэзии он является органической частью культурного и духовного пространства. В результате сравнительного исследования выявляются общие эстетические ценности и различия в художественном мышлении двух литературных традиций.*

Ключевые слова: *восточные мотивы, сравнительный анализ, художественный образ.*

Национально-специфическое и универсальное в интерпретации восточных мотивов в русской и узбекской классической литературе представляет собой важную проблему сравнительного литературоведения, позволяющую выявить как общие закономерности художественного мышления, так и уникальные особенности национальных культур. Восточные мотивы, будучи значимым элементом художественного текста,

отражают не только эстетические предпочтения авторов, но и глубинные философские, духовные и культурные ценности общества.

Актуальность данного исследования обусловлена необходимостью осмысления механизмов взаимодействия культур в условиях исторического и литературного диалога. Русская литература XIX века, представленная творчеством А.С. Пушкина и М.Ю. Лермонтова, активно обращается к восточной тематике, воспринимая Восток как пространство экзотики, духовного поиска и романтической свободы. В то же время в узбекской классической литературе восточные мотивы являются органической частью национального мировоззрения, отражая традиционные ценности, философию и эстетические идеалы[26].

В русской литературной традиции Восток часто выступает как «иной мир», противопоставленный европейской или русской культуре. Такое восприятие формирует особый художественный подход, основанный на принципе контраста. В произведениях Пушкина, таких как «Бахчисарайский фонтан» и «Кавказский пленник», восточные мотивы используются для создания эмоционально насыщенного пространства, в котором разворачиваются драматические события и внутренние конфликты героев. Восток здесь предстает как символ страсти, свободы и трагической судьбы, а его художественное изображение подчеркивает романтическую направленность произведений.

Лермонтов, развивая традиции романтизма, углубляет психологическое содержание восточных мотивов. В его поэмах «Мцыри» и «Демон» Восток становится не только фоном, но и важным фактором формирования характера героя. Природа Кавказа, ее величие и суровость, отражают внутреннее состояние персонажей, их стремление к свободе и одновременно ощущение одиночества. Восточные мотивы в творчестве

[26] Куронов Д. Сравнительное литературоведение: проблемы и методы. — Ташкент: Университет, 2005.

Лермонтова тесно связаны с философскими вопросами смысла жизни, борьбы и духовного поиска.

В узбекской классической литературе, представленной творчеством Алишера Навои, Бабура и других поэтов, восточные мотивы имеют иную природу[27]. Они не воспринимаются как «чужие» или экзотические, а являются естественной частью культурной среды. Восток здесь выступает как пространство гармонии, красоты и духовного совершенства. В произведениях Навои, особенно в «Хамсе», восточные мотивы реализуются через сложную систему символов и аллегорий, отражающих философские идеи о любви, справедливости, нравственности и человеческом совершенстве.

Особое значение в узбекской поэзии имеет образ сада как символа идеального мира. Этот образ объединяет в себе эстетическое и философское содержание, отражая представления о гармонии человека с природой и обществом. В отличие от русской романтической традиции, где Восток часто противопоставляется родной культуре, в узбекской литературе он является ее неотъемлемой частью, что определяет специфику художественного мышления и интерпретации восточных мотивов.

Сравнительный анализ показывает, что универсальные элементы восточных мотивов проявляются в стремлении к изображению красоты, любви, свободы и духовного поиска. Эти темы являются общими для обеих литературных традиций и отражают базовые человеческие ценности. Однако способы их художественного воплощения существенно различаются. В русской литературе преобладает романтический пафос, драматизм и контрастность, тогда как в узбекской поэзии доминируют гармония, символизм и философская глубина[28].

[27] Каримов Б. **Сравнительное литературоведение: Восток и Запад**. — Ташкент: Фан, 2020.
[28] Куронов Д. Сравнительное литературоведение: проблемы и методы. — Ташкент: Университет, 2005.

Национально-специфическое проявляется прежде всего в культурных кодах, системе образов и эстетических приоритетах. Русские писатели рассматривают Восток как источник вдохновения и объект художественного осмысления, тогда как узбекские поэты выражают через него собственную культурную идентичность. Это различие определяет особенности восприятия и интерпретации восточных мотивов, а также их роль в художественной структуре произведений.

Таким образом, восточные мотивы в русской и узбекской классической литературе представляют собой сложное и многогранное явление, сочетающее в себе универсальные и национально-специфические элементы. Их сравнительное изучение позволяет глубже понять особенности художественного мышления разных культур, а также выявить общие тенденции развития мировой литературы[29]. Восток в данном контексте выступает как важный культурный и эстетический феномен, объединяющий различные литературные традиции и отражающий общечеловеческие ценности.

В заключение следует отметить, что анализ национально-специфического и универсального в трактовке восточных мотивов открывает новые перспективы для дальнейших исследований в области сравнительного литературоведения. Он способствует более глубокому осмыслению процессов межкультурного взаимодействия и позволяет рассматривать литературу как пространство диалога культур, в котором формируются и развиваются ключевые художественные и философские идеи.

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THE ROLE OF DIGITAL EDUCATIONAL TECHNOLOGIES IN DEVELOPING YOUNG PUPILS' SPEECH THROUGH TEXT PROCESSING

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Abstract. *The development of speech is one of the central objectives of primary education because pupils' ability to understand, interpret and produce coherent language directly influences their academic achievement and social interaction. Text processing activities provide an effective basis for developing vocabulary, pronunciation, grammatical accuracy, reading comprehension and oral expression. In contemporary education, digital technologies expand the possibilities of working with texts by making learning more interactive, visual, individualized and engaging. This article examines the pedagogical role of digital educational technologies in developing young pupils' speech through text processing. It discusses the use of multimedia texts, interactive reading platforms, digital storytelling, speech-recording applications, collaborative tools and artificial intelligence-supported resources. The article also identifies important methodological conditions for integrating digital technologies into speech-development lessons.*

Keywords: *digital educational technologies, speech development, young pupils, text processing, primary education, digital storytelling, reading comprehension, oral communication.*

INTRODUCTION

In recent times**, s**peech development is a fundamental component of a child's intellectual, emotional and social growth. In primary school, pupils gradually learn to express their thoughts clearly, understand the ideas of others, participate in conversations and construct meaningful oral and written texts. These abilities do not develop automatically. They require systematic teaching based on appropriately selected language materials, communication activities and regular practice. Among the most effective materials for speech development are literary, informative and educational texts. Through text

processing, pupils encounter new words, grammatical structures, speech patterns and different ways of organizing ideas. Traditional text-processing activities usually include reading, retelling, answering questions, identifying the main idea and discussing characters or events. Although these methods remain pedagogically valuable, they may not always provide sufficient motivation or individualized support for contemporary pupils. Digital educational technologies help teachers enrich these activities by combining written language with sound, images, animation, video and interactive tasks. As a result, pupils do not merely read a text but interact with its content through several sensory and cognitive channels. The main advantage of digital technology is its capacity to present texts in a multimodal form.[30] A digital text may contain illustrations, audio narration, highlighted vocabulary, animated scenes and pronunciation support. Such features are especially important for young pupils, whose reading skills are still developing. When pupils simultaneously see a word, hear its pronunciation and observe a corresponding image, they understand and remember it more effectively. This combination supports vocabulary acquisition and helps children establish meaningful connections between words, objects, actions and situations.

Especially, audio-supported reading also contributes to the development of pronunciation, intonation and expressive speech. Pupils can listen to a professionally narrated text and then read the same passage aloud. By comparing their reading with the model, they become more attentive to pauses, stress, rhythm and emotional tone. Digital platforms may allow pupils to repeat difficult sentences several times without feeling embarrassed.[31] This creates a psychologically supportive learning environment in which mistakes are treated as a natural part of language development. Interactive text-processing tasks strengthen reading comprehension and prepare pupils for oral communication.

[30] Kachak T., Blyznyuk T., Hryvnak M. Speech development of younger school students using children's literature and digital tools //Mountain School of Ukrainian Carpaty. – 2023. – №. 28. – С. 98-103.
[31] HAINIUK N. WORKING WITH MEDIA TEXTS AS A FACTOR IN THE SPEECH DEVELOPMENT OF SCHOOL STUDENTS //Mountain School of Ukrainian Carpaty. – 2024. – №. 31. – С. 119-125.

After reading a digital story, children may arrange events in the correct order, match words with pictures, complete sentences or select an appropriate title. These activities teach pupils to identify key information and understand logical connections between different parts of a text. Comprehension becomes the foundation for subsequent speaking tasks because a child can retell, discuss or evaluate a text only after understanding its content.

Nowadays, digital storytelling is particularly effective in developing coherent speech. In digital storytelling activities, pupils create stories by combining words, pictures, voice recordings and simple animations. The process usually begins with selecting a topic, arranging events and preparing sentences. Pupils then record their narration and add visual elements.[32] This activity develops several interconnected skills, including planning, vocabulary selection, sentence construction, sequencing and expressive speaking. It also encourages creativity because children become authors rather than passive recipients of information. Although, retelling a text through digital tools can be organized at different levels of difficulty. Pupils with limited speaking skills may use pictures, keywords or sentence starters. More advanced pupils may retell the text independently, change the ending or narrate events from the perspective of a particular character. Digital environments make differentiation easier because the teacher can provide various types of support according to individual needs. Consequently, each pupil is able to participate in speech activities at an achievable but challenging level.[33]

Nevertheless, speech-recording applications are another valuable tool for developing oral language. When pupils record their answers, descriptions or retellings, they have an opportunity to listen to themselves and notice problems in pronunciation, fluency or sentence structure. Self-listening promotes

[32] Karagianni E., Drigas A. New Technologies for Inclusive Learning for Students with Special Educational Needs //International Journal of Online & Biomedical Engineering. – 2023. – Т. 19. – №. 5.
[33] Matoušek J. et al. Speech and web-based technology to enhance education for pupils with visual impairment //Journal on Multimodal User Interfaces. – 2020. – Т. 14. – №. 2. – С. 219-230.

reflection and self-assessment. That's why, pupils may record the same text several times, improving their performance after each attempt. The teacher can also provide individual feedback without interrupting the pupil during speaking. In this way, digital recording transforms oral speech from a momentary classroom performance into a learning product that can be reviewed and improved. Collaborative digital tools promote communication between pupils. For example, children may work in pairs to complete a digital story, discuss a character's behaviour or write questions about a text. Notwithstanding, they can contribute sentences to a shared presentation or create a collective vocabulary map. Such activities teach pupils to listen to one another, express agreement or disagreement politely and develop a common idea. Speech develops most effectively in meaningful interaction, and digital collaboration provides additional opportunities for this interaction.[34]

Another important aspect, game-based technologies can also increase pupils' interest in text processing. Digital quizzes, word puzzles, matching exercises and interactive adventures make language practice emotionally attractive. However, the educational value of a digital game depends on its methodological purpose. A game should not be included merely for entertainment. It must help pupils understand the text, learn new vocabulary, practise grammatical structures or prepare for speaking. Excessive visual effects and competition may distract pupils from the language objective. Therefore, the teacher must carefully select digital resources and maintain a balance between engagement and academic focus. Artificial intelligence-supported applications are creating new opportunities for individualized speech development. Some applications can read texts aloud, explain unfamiliar words, generate comprehension questions or provide feedback on pronunciation. Adaptive systems may adjust the complexity of tasks according to a pupil's performance.

[34] Levy R. Young children, digital technology, and interaction with text //Deconstructing digital natives. – Routledge, 2011. – C. 151-166.

Nevertheless, artificial intelligence cannot replace the teacher's professional judgment or emotional support. Young pupils need human guidance to interpret texts, express feelings, understand moral ideas and participate in genuine communication.

The most important thing, effectiveness of digital technologies depends primarily on the teacher's methodology. Before using a digital resource, the teacher should define the speech skill that pupils are expected to develop. The text must correspond to the children's age, language level, interests and cultural background. Digital activities should be connected through a logical sequence: preparation before reading, comprehension during reading and productive speech after reading. For example, pupils may first predict the content from an illustration, listen to and read the text, complete comprehension tasks and finally retell or discuss it. It is also necessary to consider screen time, information security and equal access to digital devices. Technology should complement live communication, handwriting, printed reading and face-to-face discussion rather than replace them. Young pupils require movement, emotional interaction and direct support. A balanced lesson may therefore combine a short digital text, classroom conversation, pair work and a creative oral task.

CONCLUSION

To sum up, digital educational technologies significantly enrich the process of developing young pupils' speech through text processing. Multimedia presentation improves vocabulary and comprehension, audio tools support pronunciation, digital storytelling develops coherent expression, and recording applications encourage reflection. Collaborative platforms create meaningful communication, while adaptive resources make differentiated instruction possible. However, technology becomes educationally effective only when it is guided by clear objectives and sound teaching methods. The teacher remains responsible for transforming digital resources into purposeful speech activities. When digital and traditional approaches are integrated thoughtfully, text

processing becomes more accessible, interactive and productive, enabling young pupils to develop confident, accurate and meaningful speech.

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