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ASALARICHILIK VA ASAL YIG‘ISH

Bosimova Madina Farhod qizi

Abdulla Qodiriy nomidagi Jizzax davlat pedagogika universiteti Tabiiy fanlar fakulteti Biologiya yo`nalishi talabasi

Ilmiy rahbar: dotsent Sanayeva Lola

Annotatsiya: Mazkur maqolada asalarichilikning biologik asoslari, asalarilarning hayot faoliyati, asal yig‘ish jarayoni va mahsuldorlik davrlari yoritilgan. Shuningdek, O‘zbekiston Respublikasida asalarichilikni tartibga soluvchi me’yoriy-huquqiy hujjatlar, Jizzax viloyatida sohaning hozirgi holati va rivojlanish istiqbollari tahlil qilingan. Jahonda asal ishlab chiqarish ko‘rsatkichlari hamda asalarichilikdan daromad olish imkoniyatlariga alohida e’tibor qaratilgan. Maqola talabalar, magistrantlar va soha mutaxassislari uchun mo‘ljallangan.

Kalit so‘zlar: asalarichilik, Apis mellifera, asalari oilasi, asal, nektar, gul changi, changlatish, asal yig‘ish, asal mahsuldorligi, Jizzax viloyati, O‘zbekiston Respublikasi qonunchiligi, me’yoriy-huquqiy hujjatlar, jahon asal ishlab chiqarishi, asalarichilik iqtisodiyoti, daromad olish imkoniyatlari.

KIRISH. Asalarichilik inson xo‘jalik faoliyatining qadimiy va ekologik ahamiyati yuqori bo‘lgan sohalaridan biridir. Bu soha asal, mum, propolis, gulchang, ari suti va ari zahari kabi qimmatli mahsulotlarni yetishtirish bilan birga, qishloq xo‘jaligi ekinlari va yovvoyi o‘simliklarni changlatishda ham muhim ahamiyatga ega. Shu sababli asalarichilik iqtisodiy daromad manbai bo‘lish bilan birga, oziq-ovqat xavfsizligi va biologik xilma-xillikni ta’minlashda ham muhim o‘rin tutadi.

O‘zbekistonda so‘nggi yillarda asalarichilikni rivojlantirishga e’tibor kuchayib, ari oilalarini ko‘paytirish, xo‘jaliklarni moliyaviy qo‘llab-quvvatlash, zamonaviy uskunalardan foydalanish va naslli ona arilarni yetishtirish bo‘yicha chora-tadbirlar amalga oshirilmoqda. Jizzax viloyati, ayniqsa Zomin kabi tog‘oldi hududlari, asalbop o‘simliklarning xilma-xilligi sababli asalarichilikni rivojlantirish uchun qulay tabiiy sharoitga ega.

Mazkur maqolada asalari oilasining biologik tuzilishi, asal hosil bo‘lish jarayoni, mavsumiy mahsuldorlik, asalarichilik mahsulotlari, O‘zbekistondagi huquqiy asoslar, Jizzax viloyatining imkoniyatlari, jahon asal ishlab chiqarishi hamda asalarichilikdan daromad olish masalalari tahlil qilinadi. Uy asalarisi (Apis mellifera) pardaqanotlilar turkumiga va asalarilar oilasiga mansub ijtimoiy hasharotdir. Asalari oilasi yagona biologik birlik sifatida faoliyat yuritadi. Yoz oylarida kuchli asalari oilalarida 60–90 mingtagacha ari bo‘lishi mumkin. Oila ona ari, ishchi arilar va erkak arilardan tashkil topadi. Ona ari oiladagi yagona jinsiy yetuk urg‘ochi bo‘lib, uning asosiy vazifasi tuxum qo‘yish va naslni davom ettirishdan iborat. Qulay sharoitlarda ona ari bir sutkada 1500–2000 tagacha tuxum qo‘yishi mumkin. Ishchi arilar jinsiy jihatdan rivojlanmagan urg‘ochilar bo‘lib, ular uyani tozalash, lichinkalarni boqish, mum ishlab chiqarish, nektar va gulchang yig‘ish hamda oilani himoya qilish kabi vazifalarni bajaradi. Erkak arilarning asosiy vazifasi ona arini urug‘lantirishdan iborat.

Asalari oilasining hayot faoliyati yil davomida mavsumga qarab o‘zgaradi. Bahorda oila jadal rivojlanadi, yozda nektar va gulchang yig‘ish hamda asal to‘plash kuchayadi, kuzda qishga tayyorgarlik boshlanadi. Qishda arilar uya ichida “qish to‘pi” hosil qilib, tana harorati va mushak faoliyati orqali issiqlikni saqlaydi.

Ishchi arilar yoshiga qarab turli vazifalarni bajaradi. Dastlab ular uya ichida xizmat qiladi, keyinchalik mum ishlab chiqaradi va nihoyat nektar, gulchang hamda suv yig‘uvchi uchuvchi arilarga aylanadi. Asalarilar oziqa manbalarining yo‘nalishi va masofasi haqida bir-biriga maxsus “raqs tili” orqali axborot beradi. Feromonlar esa oila ichidagi tartib va birlikni saqlashda muhim rol o‘ynaydi.

Asalarichilikning asosiy mahsuloti asal hisoblanadi. Bundan tashqari, mum, propolis, gulchang, ari suti va ari zahari ham iqtisodiy qiymatga ega mahsulotlardir. Mum kosmetika, farmatsevtika va sanoatda, propolis esa turli biologik faol mahsulotlar tayyorlashda qo‘llaniladi. Gulchang va ari suti oziq-ovqat hamda

farmatsevtika sohalarida foydalaniladi. Shu sababli asalarichilik xo‘jaliklarida qo‘shimcha mahsulotlarni sotish orqali daromad manbalarini kengaytirish mumkin.

Asalarilarning ekologik ahamiyati ham nihoyatda katta. Ular nektar yig‘ish jarayonida gul changlarini bir o‘simlikdan boshqasiga ko‘chirib, changlanish jarayonini ta’minlaydi. Mevali daraxtlar, beda, bodring, qovun-tarvuz va boshqa ko‘plab ekinlarning hosildorligida asalarilarning faoliyati muhim hisoblanadi.

Asal ishchi arilar tomonidan gul nektarini yig‘ish va qayta ishlash natijasida hosil bo‘ladi. Ari nektarni xartumi yordamida yig‘ib, asal qopchasida uyaga olib keladi. Keyinchalik nektar fermentlar ta’sirida qayta ishlanadi. Invertaza fermenti

Uyaga keltirilgan nektarning suv miqdori arilarning qanot qoqishi natijasida kamayadi va mahsulot yetiladi. Yetilgan asal mum qopqoq bilan muhrlanadi. Asal tarkibida asosan glyukoza va fruktoza, shuningdek suv, fermentlar, organik kislotalar, vitaminlar, minerallar va biologik faol birikmalar mavjud.

Asalning turi va xususiyatlari uning qaysi o‘simliklardan yig‘ilganiga bog‘liq. Bir turdagi o‘simlikdan olinadigan asal monoflyor, bir nechta o‘simlik nektaridan olinadigan asal esa poliflyor asal deb ataladi. O‘zbekistonda g‘o‘za, beda, yantoq, tog‘ o‘simliklari va boshqa asalbop o‘simliklardan asal olinadi.

O‘zbekistonda asal yig‘ish mavsumi o‘simliklarning gullash davriga bog‘liq. Aprel oyida mevali daraxtlar, may oyida ayrim yovvoyi va dorivor o‘simliklar, iyun–iyul oylarida beda, kunjut va yantoq kabi asalbop o‘simliklar gullaydi. Avgust oyida g‘o‘za gullashi muhim nektar manbalaridan biri hisoblanadi.

Ayrim ma’lumotlarga ko‘ra, paxta maydonlariga yaqin joylashtirilgan kuchli ari oilalaridan bir mavsumda 30–40 kg gacha asal olish mumkin. Umuman, O‘zbekiston sharoitida asalarilarning eng yuqori mahsuldorlik davri ko‘pincha iyun–sentabr oylariga to‘g‘ri keladi.

Asal olish jarayoni muhrlangan ramkalarni uyadan chiqarishdan boshlanadi. Ramkalardagi mum qopqoqlar ochilgach, ular medogonkaga joylashtiriladi. Markazdan qochma kuch ta’sirida asal katakchalardan ajratib olinadi. Keyin asal filtrlanadi va toza, germetik idishlarga qadoqlanadi. Zamonaviy asalarichilikda harakatlanuvchi ramkali uyalar, tutunpurkagich, himoya kiyimlari, medogonka, mum eritish uskunalari, onadonlar va izolyatorlardan foydalaniladi. Ushbu jihozlar asalarichining mehnatini yengillashtiradi, mahsulot sifatini oshiradi va ishlab chiqarish samaradorligini yaxshilaydi.

O‘zbekistonda asalarichilik qishloq xo‘jaligiga oid umumiy qonunchilik hamda sohaga tegishli maxsus me’yoriy-huquqiy hujjatlar asosida tartibga solinadi. Sohani rivojlantirishga qaratilgan muhim hujjatlardan biri O‘zbekiston Respublikasi Prezidentining 2017-yil 16-oktabrdagi PQ-3327-son “Respublikada asalarichilik tarmog‘ini yanada rivojlantirish chora-tadbirlari to‘g‘risida”gi qaroridir. Mazkur hujjat va keyingi dasturlar doirasida asalarichilik xo‘jaliklarini qo‘llab-quvvatlash, ari oilalarini ko‘paytirish, qishlov davridagi xarajatlarni qisman qoplash, changlatish xizmatlarini rag‘batlantirish va zamonaviy uskunalardan foydalanish imkoniyatlarini kengaytirishga qaratilgan choralar ko‘zda tutilgan. Shuningdek, naslli ona arilarni xorijdan olib kelish va mahalliy sharoitga moslashtirish ishlari ham amalga oshirilmoqda. Rasmiy ma’lumotlarda Ukrainadan “Karpat”, Germaniyadan “Karnika” va “Bakfast” zotlariga mansub ona arilar olib kelingani qayd etilgan. Bunday tadbirlar asalari oilalarining mahsuldorligini oshirish va naslchilik bazasini yaxshilashga xizmat qiladi.

Jizzax viloyati tog‘oldi va dasht hududlarining uyg‘unligi bilan ajralib turadi. Viloyatda bog‘dorchilik, paxtachilik, g‘allachilik, sabzavotchilik va boshqa qishloq xo‘jaligi tarmoqlari rivojlangan. Ushbu tarmoqlarning mavjudligi asalarilar uchun turli mavsumlarda nektar va gulchang manbalarini ta’minlaydi.

Zomin tumani va boshqa tog‘oldi hududlarida yovvoyi va asalbop o‘simliklarning xilma-xilligi asalarichilikni rivojlantirish uchun qulay sharoit yaratadi. Tog‘oldi hududlarida ekologik toza asal yetishtirish, uni qayta ishlash, qadoqlash va bozorga chiqarish imkoniyatlari mavjud.

Kelgusida Jizzax viloyatida asalning kimyoviy tarkibini laboratoriya sharoitida o‘rganish, sifat ko‘rsatkichlarini aniqlash, mahsulotni sertifikatlash va zamonaviy qadoqlash texnologiyalaridan foydalanish orqali hududiy asalning bozor qiymatini oshirish mumkin.

FAO ma’lumotlariga ko‘ra, 2022-yilda dunyo bo‘yicha tabiiy asal ishlab chiqarish hajmi taxminan 1,8 million tonnani tashkil etgan. Yirik ishlab chiqaruvchi davlatlar qatoriga Xitoy, Turkiya, Efiopiya, Eron, Argentina, Hindiston va Rossiya kiradi.

1-jadval

O’rin	Davlat	Ishlab chiqarish hajmi	Jahon ulushi
1	Xitoy	463,5	~28%
2	Turkiya	114,9	~7%
3	Efiopiya	84,6	~5%
4	Eron	80,4	~5%
5	Argentina	73,4	~4,4%
6	Hindiston	70,9	~4,3%
7	Rossiya	64,5	~3,9%

Jahon asal bozorida eksport va import ham muhim o‘rin tutadi. Xitoy va Argentina yirik eksport qiluvchi davlatlar qatorida bo‘lsa, AQSH va Germaniya muhim import bozorlari hisoblanadi. Bu holat asal mahsulotining xalqaro bozordagi iqtisodiy ahamiyatini ko‘rsatadi.

Asalarichilikdan olinadigan daromad ari oilalari soni, bir oilaning mahsuldorligi, asal turi, bozor narxi, ishlab chiqarish xarajatlari va tabiiy sharoitlarga bog‘liq. Oddiy sharoitlarda bir ari oilasidan mavsum davomida 5–10 kg, qulay asalbop hududlarda 15–20 kg va paxta maydonlari yaqinida kuchli oilalardan 30–40 kg gacha asal olish mumkin.

2-jadval

Xo’jalik turi	Ari oilalari soni	O’rtacha hosildorlik	Taxminiy yillik asal hajmi
Kichik (xonadon) xo’aligi	5-10	7-10 kg	35-100kg
O’rta fermer xo’jaligi	50-100	10-20kg	0,5-2 tonna
Yirik ixtisoslashgan xo’jalik	400-900	10-15kg	8014 tonna

Daromadni oshirish uchun asal bilan birga mum, propolis, gulchang va ari suti kabi mahsulotlarni sotish mumkin. Shuningdek, ari oilalarini bog‘ va issiqxonalarda changlatish xizmati sifatida foydalanish ham qo‘shimcha daromad manbai bo‘la oladi.

Asalarichilik samaradorligiga kasalliklar, zararkunandalar, pestitsidlar va iqlim sharoitlari sezilarli ta’sir ko‘rsatadi. Qishloq xo‘jaligi ekinlariga qo‘llaniladigan kimyoviy vositalar asalarilar uchun xavf tug‘dirishi mumkin. Shu sababli gullash davrida pestitsidlardan foydalanishda xavfsizlik talablariga rioya qilish va asalarichilarni oldindan xabardor qilish muhimdir. Varroa destructor kanasi ham asalari oilalarining zaiflashishiga sabab bo‘luvchi asosiy zararkunandalardan biridir. Bundan tashqari, iqlim o‘zgarishi, qurg‘oqchilik va o‘simliklarning gullash muddatlaridagi o‘zgarishlar nektar manbalariga va asal hosildorligiga ta’sir qilishi mumkin.

Asalarichilik biologik, ekologik va iqtisodiy jihatlarni o‘zida mujassam etgan muhim qishloq xo‘jaligi tarmog‘idir. Asalarilar asal va boshqa qimmatli mahsulotlarni yetishtirish bilan birga, o‘simliklarni changlatish orqali qishloq xo‘jaligi hosildorligiga ham katta hissa qo‘shadi. O‘zbekiston sharoitida asal yig‘ishning eng faol davri, odatda, iyun–sentabr oylariga to‘g‘ri keladi. Ayniqsa g‘o‘za, beda, yantoq va tog‘ o‘simliklari asalarilar uchun muhim nektar manbai hisoblanadi. Davlat tomonidan ko‘rsatilayotgan moliyaviy va tashkiliy yordam, zamonaviy uskunalardan foydalanish hamda naslli ona arilarni yetishtirish sohaning rivojlanishi uchun muhim omillardir. Jizzax viloyati, xususan Zomin tumani, tabiiy-geografik sharoiti va asalbop o‘simliklarga boyligi sababli asalarichilikni rivojlantirish uchun yaxshi imkoniyatlarga ega. Kelgusida asal sifatini laboratoriya sharoitida o‘rganish, mahsulotni sertifikatlash, zamonaviy qadoqlash va qayta ishlash texnologiyalarini joriy etish orqali hududda asalarichilikning iqtisodiy samaradorligini yanada oshirish mumkin.

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Digital Competence, Media and Information Literacy, and Artificial Intelligence Literacy among Library and Information Science Students in Uzbekistan: A Descriptive Cross-Sectional Survey

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Abstract

Purpose. Library and information science (LIS) programmes are expected to prepare graduates who can use digital technologies, evaluate media content critically and understand the role of artificial intelligence (AI) in information services. Empirical evidence on these competencies among LIS students in Uzbekistan is scarce, and existing studies rarely separate what students believe they can do from what they know. This study describes the digital competence, media and information literacy (MIL) and AI literacy of LIS students in Uzbekistan, distinguishing self-reported competence from responses to knowledge items.

Design/Methodology. A descriptive cross-sectional survey was conducted among full-time LIS students at three higher education institutions in Tashkent and Nukus (accessible population ≈ 668). Two independent online questionnaires were used: a digital competence questionnaire based on DigComp 2.2 (n = 105) and an MIL and AI literacy questionnaire based on the UNESCO MIL framework (n = 173). Data were summarised with frequencies, percentages, means, standard deviations and 95% Wilson confidence intervals.

Results. Most students rated their overall digital skill as intermediate (60.0%); only 9.5% rated it as high, and 37.1% reported being able to perform a complex database search independently. Half (51.4%) were familiar with the concept of media education, 72.8% considered it important and 76.9% favoured compulsory practice-oriented courses. Only 26.0% felt confident in verifying the reliability of sources. On single-best-answer knowledge items, 58.4% identified the principles of cyberethics, 55.5% the analytical role of AI in media content, 48.6% the components of critical evaluation and 39.9% the core principle of media security.

Conclusions. Students reported broadly positive attitudes towards media education but limited confidence in source verification, and fewer than half answered the critical-evaluation and media-security knowledge items correctly. These descriptive findings suggest priorities for LIS curricula: practice-oriented source verification, digital safety and professionally oriented AI literacy. The results describe perceived competence and selected knowledge rather than demonstrated performance and cannot be generalised beyond the participating institutions.

Keywords: digital competence; media and information literacy; artificial intelligence literacy; library and information science education; LIS students; Uzbekistan

1. INTRODUCTION

The digitalisation of library and information services is changing the professional role of librarians. Beyond acting as intermediaries between users and collections, librarians increasingly support users in finding, evaluating, interpreting and ethically reusing digital information (Sanches, 2022). Libraries are therefore expected to function as educational and innovation centres that support the development of digital, media and AI-related competencies among their users (Ganieva & Usmanova, 2024; IFLA, 2011). For LIS education, this shift raises a practical question: to what extent do current students, the future workforce of the sector, possess these competencies themselves?

International research has begun to address this question, but unevenly. A review of 60 studies found that information-literacy assessment in academic libraries is far more established than media-literacy assessment and called for emerging literacies, including generative AI, to be integrated into systematic assessment (Pinto et al., 2024). Studies of AI literacy among LIS students have so far concentrated on South Asia (Hossain et al., 2025), and studies of AI literacy among library staff on North America (Lo, 2024). In Uzbekistan, the literature on media education for library specialists is mainly conceptual and pedagogical

(Ganieva & Usmanova, 2024; Usmanova, 2023; Usmanova et al., 2025), and we are not aware of a published empirical survey that describes LIS students' digital competence, MIL and AI literacy together.

A second limitation of existing work is methodological. Many competence surveys rely on self-assessment, although self-reported digital competence can differ substantially from actual performance (Porat et al., 2018). Studies that report confidence and knowledge side by side, without separating them, risk overstating students' readiness.

This study addresses both gaps. Its aim is to describe the digital competence, media and information literacy and AI literacy of LIS students in Uzbekistan, keeping self-reported (perceived) competence, attitudes and knowledge-item results analytically separate. The study is descriptive: it does not test hypotheses or causal relationships. It addresses three research questions:

RQ1. How do LIS students in Uzbekistan perceive their digital competence in information searching, the use of office and cloud tools, and overall digital skill?

RQ2. What are LIS students' awareness of and attitudes towards media education, how confident are they in selected MIL skills, and how accurately do they answer knowledge items on critical evaluation, media security and cyberethics?

RQ3. How accurately do LIS students identify the role of AI in analysing media content?

The contribution of the study is twofold. First, it provides baseline empirical evidence on three related competency domains among LIS students in Uzbekistan, a context that is under-represented in the international LIS literature. Second, by reporting perceived competence and knowledge items separately, it shows where students' confidence and knowledge diverge, which is directly relevant to the redesign of LIS curricula.

2. LITERATURE REVIEW

2.1. Defining the three competency domains

Digital competence. Digital competence is a broad, policy-driven concept that combines technical skills with the knowledge and attitudes needed to use digital technologies confidently, critically and responsibly (Ilomäki et al., 2016). The European Digital Competence Framework for Citizens, DigComp 2.2, organises it into five areas: information and data literacy, communication and collaboration, digital content creation, safety, and problem solving (Vuorikari et al., 2022). Freiman et al. (2017) describe digital competence as a lifelong continuum in which digital skills develop together with transferable competencies. In this study, digital competence refers to students' self-reported ability to search for and evaluate information, use office and cloud-based tools, and their overall rating of their digital skill.

Media and information literacy. UNESCO uses media and information literacy (MIL) as an umbrella term for the competencies needed to access, analyse, evaluate, create and ethically use information and media content (UNESCO, 2021). MIL brings together traditions of media literacy, which focuses on understanding and critically interpreting media messages (Buckingham, 2003; Hobbs, 2021; Potter, 2019), and information literacy, which focuses on finding and evaluating information (Koltay, 2011). Following this usage, the present article uses *MIL* for the competency domain, *media literacy* only when referring to the media-related component of MIL, and *media education* for the educational process through which MIL is developed. The term *media education* also appears in the questionnaire items, because it is the established term in the Russian- and Uzbek-language literature on library education (Fedorov, 2015; Gendina, 2017).

AI literacy. AI literacy is commonly defined as a set of competencies that enable people to understand what AI is and how it works, to evaluate AI technologies critically, and to use and communicate with AI

effectively and ethically (Long & Magerko, 2020). Ng et al. (2021) identify four dimensions: knowing and understanding AI, using and applying AI, evaluating and creating AI, and AI ethics. In this study, AI literacy was operationalised narrowly, as knowledge of the role of AI in analysing media content (Section 3.5). The study therefore addresses only the *knowing and understanding* dimension of AI literacy and does not measure practical use, evaluation or ethical reasoning.

The three domains overlap (for example, evaluating sources belongs to both DigComp's information and data literacy area and to MIL), but they differ in emphasis: digital competence is centred on the use of technologies, MIL on the critical treatment of information and media content, and AI literacy on understanding and using a specific class of technologies. Treating them as related but distinguishable domains is consistent with recent recommendations for academic library assessment (Pinto et al., 2024).

2.2. Digital, media and AI competencies in LIS education and practice

Research on higher education librarians emphasises their role in helping students assess the origin, credibility and appropriate reuse of digital information (Sanches, 2022). Misinformation has increased the importance of this role: Saunders (2025) argues that combating misinformation requires an interdisciplinary approach to information literacy in which librarians are key partners, and Matanji et al. (2026) describe media literacy and fact-checking as complementary proactive and reactive responses to misinformation. Evidence from LIS students points to gaps in exactly these areas. Tsabedze (2025) found that LIS students relied heavily on social media as a news source and shared information despite being unsure of its authenticity.

Studies of AI literacy show a similar pattern of familiarity without depth. Hossain et al. (2025) found that LIS students in Bangladesh, India and Pakistan were moderately familiar with AI tools, but their AI literacy varied widely and they expressed concerns about ethical use and academic integrity. In a survey of 760 academic library employees in the United States, Lo (2024) found modest self-rated understanding of AI concepts, limited hands-on experience and gaps in discussing ethical implications. At the institutional level, Ali and Richardson (2025) concluded that library professionals must themselves become AI-literate in order to support users, and Molaudzi and Ngulube (2025) found that the absence of clear institutional strategies constrained the adoption of AI in academic libraries.

2.3. Perceived versus actual competence

Most of the studies reviewed above rely on self-report. Self-assessment is useful for describing confidence and perceived needs, but it is not a substitute for measuring performance. Porat et al. (2018) compared students' perceived and actual digital literacies and found that students were highly confident and significantly over-estimated their competencies. For this reason, the present study distinguishes four types of evidence: attitudes and awareness, perceived (self-reported) competence, knowledge assessed with single-best-answer items, and self-reported frequency or use of tools. It does not measure demonstrated performance.

2.4. The Uzbek and regional context

In the Russian- and Uzbek-language literature, media education in libraries has developed mainly as a pedagogical and theoretical field. Fedorov (2015) traced the history and theory of media education, Gendina (2017) argued for media education as a new direction in the training of library staff, and Kubrak (2022) proposed methods for developing teacher-librarians' MIL through distance learning. Shi and Zhilavskaya (2020) reviewed the media educational activities of libraries in other countries. In Uzbekistan, recent work has addressed media education in the training of library specialists (Ganieva & Usmanova, 2024), the information culture of humanities students (Usmanova, 2023) and the foundations of media literacy for

library specialists (Usmanova et al., 2025). These publications set out the rationale for including MIL in LIS curricula but do not report survey data on students' competencies.

2.5. Research gap

Three gaps follow from this review. First, there is no published empirical description of LIS students' digital competence, MIL and AI literacy in Uzbekistan. Second, survey studies of these competencies often do not separate perceived competence from knowledge, which may overstate readiness. Third, empirical work on AI literacy among LIS students comes mainly from other regions. The present study responds to these gaps with a descriptive survey that reports the three domains for LIS students in Uzbekistan and keeps the types of evidence separate.

3. METHODS

3.1. Research design

The study used a descriptive cross-sectional survey design. Its purpose was to describe the distribution of LIS students' responses in three competency domains, not to compare groups, test hypotheses or examine causal relationships. Accordingly, results are reported with descriptive statistics and confidence intervals, and interpretations offered in the Discussion are presented as possible explanations rather than tested findings.

3.2. Setting and population

The target population was full-time undergraduate LIS students in Uzbekistan. The accessible population comprised all full-time students in years 1–4 of LIS programmes at three higher education institutions: the Uzbekistan State Institute of Arts and Culture (UzSIAC) in Tashkent, its Nukus branch in the Republic of Karakalpakstan, and the Tashkent University of Information Technologies named after Muhammad al-Khwarizmi (TUIT). Together these institutions enrolled approximately 668 full-time LIS students at the time of the survey (Table 1). Students of all four years of study were eligible. Part-time and distance-learning students were not included. The two regions represented are Tashkent city and the Republic of Karakalpakstan.

Table 1. Accessible population of full-time LIS students by institution and year of study

Institution	Region	Year 1	Year 2	Year 3	Year 4	Total
Uzbekistan State Institute of Arts and Culture (UzSIAC)	Tashkent city	150	110	80	75	415
UzSIAC, Nukus branch	Republic of Karakalpakstan	27	25	37	34	123
Tashkent University of Information Technologies (TUIT)	Tashkent city	50	51	4	17 + 8a	130
Total		227	186	121	134	668

Note. a Year 4 at TUIT comprises 17 students in Uzbek-language groups and 8 students in a Russian-language group. [AUTHORS: confirm that the 8 Russian-group students are in addition to the 17; if they are included in the 17, the TUIT total is 122 and the overall total 660.]

3.3. Sampling and recruitment

A non-probability, voluntary-response approach was used. Links to the online questionnaires were sent to all full-time LIS students at the three institutions through [AUTHORS: specify channel, e.g., academic advisers / department heads / Telegram group chats of student groups] during [AUTHORS: month(s) and year of data collection]. No incentives were offered. Because participation was voluntary and only students who chose to respond are included, the sample is self-selected and is not statistically representative of all LIS students in Uzbekistan.

The MIL and AI literacy questionnaire was completed by 173 students and the digital competence questionnaire by 105 students, corresponding to approximately 25.9% and 15.7% of the accessible population, respectively. [AUTHORS: if the questionnaires recorded institution and year of study, report the number of respondents by institution and year here, so that readers can judge coverage of each site and year.]

3.4. Structure of the two questionnaires

Digital competence and MIL/AI literacy were measured with two separate questionnaires administered as two separate Google Forms. Two forms were used to keep each questionnaire short and to reduce respondent fatigue [AUTHORS: confirm or replace with the actual reason]. Students could complete either questionnaire or both. Because both questionnaires were anonymous and contained no common identifier, responses could not be linked across the two forms. The two subsamples (n = 105 and n = 173) are therefore treated as independent sets of responses. It is not known how many students completed both questionnaires, so the total of 278 refers to questionnaire responses rather than unique individuals. For the same reason, relationships between digital competence and MIL/AI literacy could not be examined at the individual level, and no such relationships are reported.

3.5. Instruments

Table 2 summarises the two instruments. The digital competence questionnaire was developed with reference to DigComp 2.2 (Vuorikari et al., 2022). The items reported here cover the information and data literacy area (searching, attention to reliable sources, complex database searching), the communication and collaboration area (use of Google services) and the digital content creation area (proficiency in office applications), together with two overall self-ratings. The DigComp areas of safety and problem solving were not covered by the reported items. The MIL and AI literacy questionnaire was developed with reference to the UNESCO MIL curriculum and competency framework (UNESCO, 2021). It contained items on awareness of and attitudes towards media education, a checklist of skills in which respondents felt confident, and four single-best-answer knowledge items on critical evaluation of media content, media security, cyberethics and the role of AI in analysing media content.

Table 2. Overview of the two questionnaires

Feature	Digital competence questionnaire	MIL and AI literacy questionnaire
Reference framework	DigComp 2.2 (Vuorikari et al., 2022)	UNESCO MIL curriculum and competency framework (UNESCO, 2021)
Respondents	n = 105	n = 173
Number of items	[AUTHORS: total number of items]	[AUTHORS: total number of items]
Domains covered by the reported items	Information and data literacy; communication and collaboration;	Awareness of and attitudes towards media education; perceived MIL skills; knowledge of critical evaluation, media

	digital content creation; overall self-rating	security and cyberethics; knowledge of the role of AI in media analysis
Item and response formats	Ordinal self-ratings (3- or 4-point); multiple-response checklists	Single-choice attitude items (3- or 4-option); multiple-response confidence checklist; four single-best-answer knowledge items (four options, one correct)
Type of evidence	Perceived competence; self-reported use of tools	Attitudes and awareness; perceived competence; knowledge
Sample item	"How would you rate your overall level of digital technology skills?" (low / beginner / intermediate / high)	"What does critical evaluation of media content include?" (correct option: assessing source reliability, message intent and possible manipulative influence)
Language of administration	[AUTHORS: e.g., Uzbek and Russian]	[AUTHORS: e.g., Uzbek and Russian]

Note. The full item wording of both questionnaires is provided in [AUTHORS: Appendix A / supplementary file].

Development, translation and review. Items were drafted by the authors on the basis of the descriptors of the two frameworks. [AUTHORS: describe translation, e.g., "Items were written in Uzbek, translated into Russian by a bilingual LIS lecturer, and checked by back-translation".] [AUTHORS: describe expert review, e.g., "The draft questionnaires were reviewed by N experts in LIS education and information technology, who assessed the relevance and clarity of each item; items were revised accordingly". If no expert review took place, delete this sentence and state this in the Limitations.] [AUTHORS: describe pilot testing, e.g., "The questionnaires were piloted with N students who were not included in the final sample, and ambiguous wording was corrected". If no pilot took place, delete and state this in the Limitations.]

Reliability and validity. Most items in both questionnaires are single-indicator categorical items, multiple-response checklists or single-best-answer knowledge items, rather than multi-item scales intended to measure one latent construct. Internal-consistency coefficients such as Cronbach's alpha or McDonald's omega are therefore not applicable to the results reported here, and none are claimed. [AUTHORS: if either questionnaire contains a block of Likert-type items intended as a scale, compute and report Cronbach's alpha / McDonald's omega for that block from the raw data.] Alignment of the items with DigComp 2.2 and the UNESCO MIL framework supports content coverage but does not by itself establish the validity of the questionnaires; no evidence of construct validity (such as factor analysis) is available. Results are therefore reported at the level of individual items, and composite competence scores are not computed.

Scoring of knowledge items. Each knowledge item had one correct option. Several incorrect options combined a correct element with an incorrect one (for example, "counting views and comments alongside assessing manipulative influence"). Such items test whether respondents can identify the complete and correct description, and incorrect responses should not be read as a complete absence of knowledge.

3.6. Data analysis

Technical fields generated automatically by Google Forms (timestamps, scoring and feedback columns) were removed before analysis. All responses received were complete and were retained [AUTHORS: confirm; if incomplete or duplicate responses were removed, state how many]. For each item, frequencies and percentages were computed with 95% confidence intervals using the Wilson score method (Wilson, 1927), which is recommended for proportions in moderate samples. For three-point ordinal self-ratings, responses were coded 1–3 and summarised with the mean, standard deviation and median for descriptive

purposes only. Multiple-response items are reported as the percentage of respondents selecting each option and do not sum to 100%. Because the two subsamples could not be linked and the design is descriptive, no inferential comparisons between subsamples were made. Comparisons between perceived-competence items and knowledge items are made descriptively at the aggregate level. Analyses were carried out in [AUTHORS: software, e.g., IBM SPSS Statistics 27 / Python 3 with SciPy].

3.7. Ethical considerations

Participation was voluntary and anonymous. Before starting the questionnaire, students were informed of the purpose of the study, that participation was voluntary and that they could stop at any time; submitting the form was taken as consent. No personally identifiable information was collected. [AUTHORS: add ethics approval statement, e.g., "The study was approved by the <committee name> of <institution>, protocol No. ___, date ___", or explain why formal approval was not required under institutional rules.]

4. RESULTS

4.1. Respondents

The analysis includes 173 responses to the MIL and AI literacy questionnaire and 105 responses to the digital competence questionnaire from full-time LIS students at the three institutions (Section 3.3). [AUTHORS: if available, report respondents' distribution by institution, year of study and gender.]

4.2. Perceived digital competence (RQ1)

Table 3 presents students' self-reported digital competence. Most students rated their overall digital skill as intermediate (60.0%, 95% CI [50.4, 68.9]), and 9.5% [5.3, 16.6] rated it as high. A similar pattern appeared for the level at which students used digital tools in their studies: 59.0% reported an intermediate or sufficient level and 21.9% a high level (M = 2.03, SD = 0.64 on a 1–3 scale).

For information searching, 60.0% [50.4, 68.9] reported that they regularly paid attention to the reliability or scientific status of sources. Google was the most frequently used search engine (89.5%). Just over a third of students (37.1% [28.5, 46.7]) reported being able to carry out a complex search in an electronic library or database independently; most (58.1%) could do so only partially or with assistance. Students most often reported sufficient proficiency in MS Word (69.5%) and Excel (66.7%). Among Google services, Google Drive (52.4%) and Google Docs (44.8%) were used most often, and Google Forms (21.0%) and Google Sheets (15.2%) least often.

Table 3. Self-reported digital competence of LIS students (digital competence questionnaire, n = 105)

Item	Response	n	% [95% CI]
Overall self-ratings (perceived competence)	Overall self-ratings (perceived competence)	Overall self-ratings (perceived competence)	Overall self-ratings (perceived competence)
Overall level of digital technology skillsa	Low	13	12.4 [7.4, 20.0]
	Beginner	19	18.1 [11.9, 26.5]
	Intermediate	63	60.0 [50.4, 68.9]
	High	10	9.5 [5.3, 16.6]
Level of digital-tool use for study (M = 2.03, SD = 0.64, Mdn = 2)	Low	20	19.0 [12.7, 27.6]
	Intermediate / sufficient	62	59.0 [49.5, 68.0]

	High	23	21.9 [15.1, 30.7]
Information and data literacy	Information and data literacy	Information and data literacy	Information and data literacy
Attention to reliable or scientific sources (M = 2.56, SD = 0.57, Mdn = 3)	No, rarely	4	3.8 [1.5, 9.4]
	Sometimes	38	36.2 [27.6, 45.7]
	Yes, regularly	63	60.0 [50.4, 68.9]
Ability to perform a complex search in an e-library or database (M = 2.32, SD = 0.56, Mdn = 2)	No, needs help	5	4.8 [2.1, 10.7]
	Partially / with assistance	61	58.1 [48.5, 67.1]
	Independently and effectively	39	37.1 [28.5, 46.7]
Search engines used most (use)b	Google	94	89.5 [82.2, 94.0]
	Yandex	39	37.1 [28.5, 46.7]
	Yahoo	7	6.7 [3.3, 13.1]
Digital content creation	Digital content creation	Digital content creation	Digital content creation
Office applications used with sufficient proficiency (perceived competence)b	MS Word	73	69.5 [60.2, 77.5]
	MS Excel	70	66.7 [57.2, 75.0]
	MS PowerPoint	55	52.4 [42.9, 61.7]
Communication and collaboration	Communication and collaboration	Communication and collaboration	Communication and collaboration
Google services used (use)b	Google Drive	55	52.4 [42.9, 61.7]
	Google Docs	47	44.8 [35.6, 54.3]
	Google Forms	22	21.0 [14.3, 29.7]
	Google Sheets	16	15.2 [9.6, 23.3]

Note. CI = Wilson score confidence interval. Means are reported for three-point items coded 1 (lowest) to 3 (highest). a Response options are listed in the order in which they appeared in the questionnaire; because the ordering of "low" and "beginner" is ambiguous, no mean is reported for this item. b Multiple-response item; percentages do not sum to 100%.

4.3. Media and information literacy (RQ2)

Awareness and attitudes. About half of the students (51.4% [44.0, 58.8]) reported being familiar with the concept of media education, 43.4% had heard of it but not in depth, and 5.2% encountered it for the first time (Table 4). Most considered media education important (72.8% [65.8, 78.9]). A majority (60.7%) stated that the current curriculum covered media education sufficiently, yet 76.9% [70.1, 82.5] favoured strengthening it through compulsory practice-oriented courses, and a further 15.6% through elective courses.

Table 4. Awareness of and attitudes towards media education (MIL and AI literacy questionnaire, n = 173)

Item	Response	n	% [95% CI]
Familiarity with the concept of media education	Familiar	89	51.4 [44.0, 58.8]
	Heard of it, but not in depth	75	43.4 [36.2, 50.8]
	First encounter	9	5.2 [2.8, 9.6]
Media education is important	Yes	126	72.8 [65.8, 78.9]
	Partly	44	25.4 [19.5, 32.4]
	No	3	1.7 [0.6, 5.0]
Current curriculum covers media education sufficiently	Yes	105	60.7 [53.3, 67.7]
	Partly	58	33.5 [26.9, 40.9]
	No	10	5.8 [3.2, 10.3]
How media education should be strengthened	As compulsory practice-oriented courses	133	76.9 [70.1, 82.5]
	Only as elective courses	27	15.6 [11.0, 21.8]
	Difficult to answer	10	5.8 [3.2, 10.3]
	Not needed; current preparation is sufficient	3	1.7 [0.6, 5.0]

Note. CI = Wilson score confidence interval. All items are attitude or awareness items.

Perceived MIL skills. Students most often reported confidence in preparing presentations (57.8% [50.4, 64.9]), working with electronic catalogues (49.1%) and searching for scientific information (45.1%). Confidence in verifying the reliability of sources was reported by 26.0% [20.0, 33.0], the lowest of the four skills listed (Table 5).

Knowledge items. On the critical-evaluation item, 48.6% [41.2, 56.0] chose the correct option (assessing source reliability, message intent and possible manipulative influence). The most frequent incorrect options combined counting views and comments with assessing manipulation (19.7%) or focused only on the visual design of materials (19.7%). On the media-security item, 39.9% [32.9, 47.3] chose the correct option (complying with safety norms and preventing threats in the information and communication environment); 27.2% chose an option centred on promoting media materials and 24.3% an option involving downloading materials without verification. The cyberethics item was answered correctly by 58.4% [50.9, 65.5], with 22.0% choosing an option that combined internet-marketing methods with data protection.

4.4. AI literacy (RQ3)

On the AI item, 55.5% [48.0, 62.7] correctly identified the role of AI in analysing media content as automated text processing, detection of disinformation or manipulation, and semantic analysis (Table 5). The most frequent incorrect option, chosen by 28.3% [22.1, 35.5], combined the generation of random images with manipulation detection and semantic analysis. A further 11.0% chose an option stating that AI is used to produce disinformation.

Table 5. Perceived MIL skills and knowledge items (MIL and AI literacy questionnaire, n = 173)

Item	Response	n	% [95% CI]

Perceived competence: skills respondents feel confident in (multiple response)	Perceived competence: skills respondents feel confident in (multiple response)	Perceived competence: skills respondents feel confident in (multiple response)	Perceived competence: skills respondents feel confident in (multiple response)
	Preparing presentations	100	57.8 [50.4, 64.9]
	Working with electronic catalogues	85	49.1 [41.8, 56.5]
	Searching for scientific information	78	45.1 [37.9, 52.5]
	Verifying the reliability of sources	45	26.0 [20.0, 33.0]
Knowledge: media and information literacy (single best answer)	Knowledge: media and information literacy (single best answer)	Knowledge: media and information literacy (single best answer)	Knowledge: media and information literacy (single best answer)
What critical evaluation of media content includes	Correct: assessing source reliability, message intent and possible manipulative influence	84	48.6 [41.2, 56.0]
	Counting views and comments alongside assessing manipulative influence	34	19.7 [14.4, 26.2]
	Evaluating only the visual design of materials	34	19.7 [14.4, 26.2]
	Retelling information without analysis	21	12.1 [8.1, 17.8]
Core element of media security	Correct: complying with safety norms and preventing threats in the information and communication environment	69	39.9 [32.9, 47.3]
	Promoting media materials digitally while preventing threats	47	27.2 [21.1, 34.2]
	Downloading digital materials without verification while preventing threats	42	24.3 [18.5, 31.2]
	Rapid publication of information	15	8.7 [5.3, 13.8]
Cyberethics in library and information work	Correct: safe online behaviour, personal-data protection, preventing digital risks	101	58.4 [50.9, 65.5]
	Internet-marketing methods plus data protection	38	22.0 [16.4, 28.7]
	Working with traditional card catalogues	22	12.7 [8.5, 18.5]

	Creating media products as a creative activity	12	6.9 [4.0, 11.7]
Knowledge: AI literacy (single best answer)	Knowledge: AI literacy (single best answer)	Knowledge: AI literacy (single best answer)	Knowledge: AI literacy (single best answer)
Role of AI technologies in analysing media content	Correct: automated text processing, detecting disinformation or manipulation, semantic analysis	96	55.5 [48.0, 62.7]
	Generating random images plus detecting manipulation and semantic analysis	49	28.3 [22.1, 35.5]
	Automated text processing and producing disinformation	19	11.0 [7.1, 16.5]
	Adjusting visual parameters of images plus semantic analysis	9	5.2 [2.8, 9.6]

Note. CI = Wilson score confidence interval. The confidence checklist is a multiple-response item; percentages do not sum to 100%.

4.5. Perceived competence and knowledge at a glance

Figure 1 brings together the main perceived-competence and knowledge indicators from both questionnaires. Correct-answer rates on the four knowledge items ranged from 39.9% to 58.4%; none exceeded 60%. Among perceived-competence indicators, the proportion of students confident in verifying the reliability of sources (26.0%) was lower than the proportion who correctly identified the components of critical evaluation (48.6%), and the two confidence intervals did not overlap. Because these two items measure different things (confidence in a skill and recognition of a definition), this contrast is descriptive and is not a test of a difference.

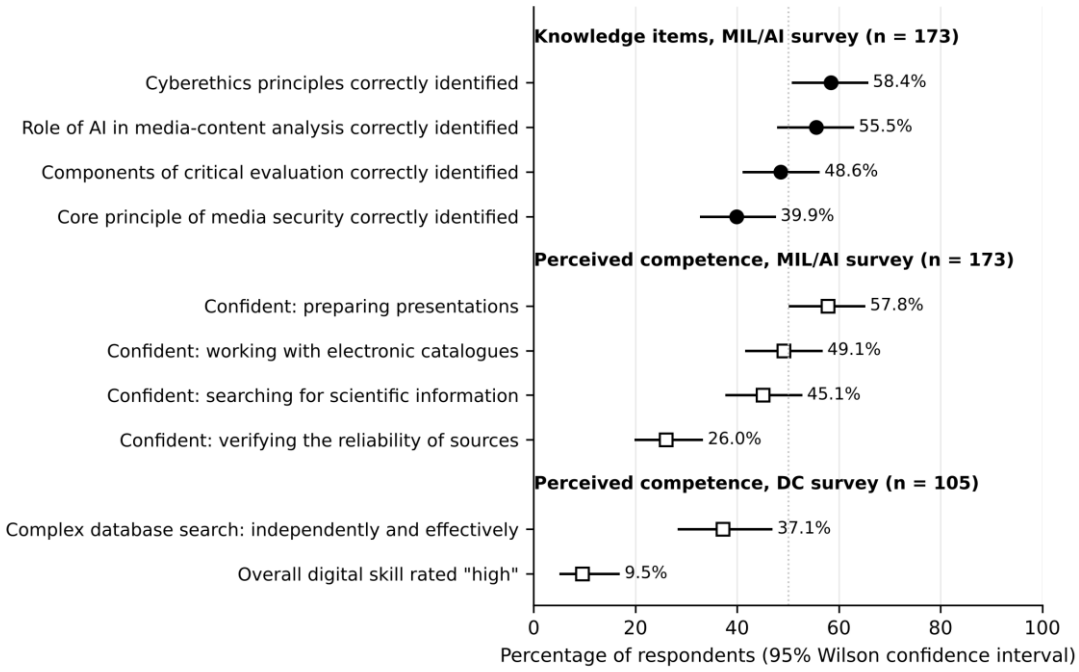


Figure 1. Knowledge-item accuracy and perceived competence of LIS students with 95% Wilson confidence intervals. Filled circles: knowledge items (percentage answering correctly). Open squares: perceived competence (percentage reporting confidence or the highest response level).

5. DISCUSSION

This study described the digital competence, MIL and AI literacy of LIS students at three institutions in Uzbekistan, keeping perceived competence, attitudes and knowledge separate. Three findings stand out: students' attitudes towards media education were clearly positive; their confidence in source verification and their knowledge of critical evaluation and media security were limited; and their understanding of AI in media analysis was partial.

5.1. Perceived digital competence

Students mostly placed their digital skills at an intermediate level, and relatively few reported being able to perform a complex database search independently. Their reported tool use centred on standard office applications, Google Drive and Google Docs, while tools that require more structured work with data, such as Google Sheets and Forms, were used less. Because these are self-ratings, they describe how students see themselves rather than what they can do; Porat et al. (2018) showed that such self-ratings can over-estimate actual performance. Even taken at face value, the results suggest that routine use of digital tools is widespread, while the competencies that DigComp 2.2 places in the information and data literacy and content creation areas, such as advanced searching and structured data handling, are less developed (Vuorikari et al., 2022). This is consistent with a view of digital competence as a continuum that extends beyond everyday technology use (Freiman et al., 2017; Ilomäki et al., 2016). The DigComp areas of safety and problem solving were not covered by the reported items, so no conclusion can be drawn about them from this questionnaire.

5.2. Media and information literacy: positive attitudes, limited verification

Most students considered media education important and wanted it strengthened through compulsory, practice-oriented courses. At the same time, a majority stated that the current curriculum covered media education sufficiently. One possible interpretation is that students regard the theoretical coverage as

adequate but want more practical training; this interpretation was not tested and would need to be examined in future research, for example through interviews or an analysis of course syllabi.

The clearest gap concerned source verification. Only about a quarter of students felt confident in verifying the reliability of sources, the lowest of the skills listed, and fewer than half recognised the complete definition of critical evaluation. Fewer than half also identified the core principle of media security. These results are consistent with Tsabedze's (2025) finding that LIS students shared information despite doubts about its authenticity, and with Pinto et al.'s (2024) observation that media-literacy assessment and teaching lag behind information literacy in academic libraries. Because librarians are expected to help users judge the origin and credibility of information (Sanches, 2022) and to take part in responses to misinformation (Matanji et al., 2026; Saunders, 2025), verification and digital safety appear to be priority areas for LIS curricula.

The pattern of incorrect answers is also informative. Many incorrect options combined a correct element with an irrelevant or inappropriate one, such as counting views and comments, or promoting and downloading materials. A plausible reading is that students recognise some relevant concepts but do not yet distinguish the essential components of critical evaluation and media security from superficial or unsafe practices. This reading is a hypothesis; confirming it would require performance-based tasks.

5.3. AI literacy

Just over half of the students correctly identified the analytical role of AI in media content, while more than a quarter chose an option that included generating random images. This may reflect the public visibility of generative AI tools, but this explanation was not tested. The result resembles the findings of Hossain et al. (2025), who described LIS students' AI literacy as uneven, and of Lo (2024), who found modest conceptual understanding of AI among academic library employees. Since AI literacy in this study was measured by a single knowledge item, the findings concern only one aspect of the *knowing and understanding* dimension of AI literacy (Ng et al., 2021). They say nothing about students' ability to use AI tools in library services or to reason about the ethics of AI. Developing these further dimensions in LIS education is likely to require both curricular change and institutional guidance (Ali & Richardson, 2025; Molaudzi & Ngulube, 2025).

5.4. Implications for LIS education

Within the limits of a descriptive study, the findings point to three practical priorities for LIS programmes in Uzbekistan. First, source verification and fact-checking could be taught through practical exercises with real information sources rather than through definitions alone. Second, digital and media safety, including the protection of personal data, could be addressed explicitly, since it was among the least accurately answered areas. Third, AI literacy could be developed beyond general familiarity, towards understanding how AI is applied to information retrieval, content analysis and library services, and towards the ethical questions such applications raise. These recommendations follow from the response patterns described above; their effectiveness would need to be evaluated in intervention studies.

5.5. Limitations

Several limitations should be considered. First, the sample was self-selected and drawn from three institutions in two regions, with response proportions of approximately 26% and 16% of the accessible population. Students who chose to respond may differ from those who did not, and the findings cannot be generalised to all LIS students in Uzbekistan or to students at other institutions. Second, the two questionnaires were completed by two unlinked subsamples, so relationships between digital competence, MIL and AI literacy could not be examined at the individual level. Third, most results are based on self-report and therefore describe perceived competence; the knowledge items measure recognition of correct

descriptions; demonstrated performance was not measured. Fourth, the questionnaires were developed by the authors with reference to international frameworks, but evidence of their construct validity is not available, and AI literacy was measured with a single item. [AUTHORS: if no expert review or pilot test took place, add: "The questionnaires were not subjected to formal expert review or pilot testing."] Fifth, the data are cross-sectional and do not allow conclusions about change over time or about the effects of the curriculum.

Future research should use linked, validated multi-item scales that cover all DigComp areas and all dimensions of AI literacy, include performance-based tasks such as verifying the credibility of real sources, and draw on probability samples from all institutions offering LIS programmes in Uzbekistan. With such data, correlational analyses of the relationships between the three domains, and their association with students' perceived professional readiness, would become possible.

6. CONCLUSION

This descriptive survey provides baseline evidence on the digital competence, media and information literacy and AI literacy of LIS students at three institutions in Uzbekistan. Students generally rated their digital skills as intermediate and expressed strong support for practice-oriented media education. However, only a quarter felt confident in verifying the reliability of sources, and fewer than half correctly answered the knowledge items on critical evaluation and media security. Just over half correctly identified the analytical role of AI in media content. These findings do not measure demonstrated performance and are not generalisable beyond the participating institutions, but they identify source verification, digital safety and professionally oriented AI literacy as areas that merit attention in the development of LIS curricula in Uzbekistan.

DECLARATIONS

Data availability. [AUTHORS: e.g., "The anonymised survey data are available from the corresponding author on reasonable request" or a repository link.]

Funding. [AUTHORS: funding source or "This research received no external funding."]

Conflict of interest. The authors declare no conflict of interest.

Author contributions. [AUTHORS: e.g., CRediT statement.]

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O‘ZBEKISTONNING JAHON SAVDO TASHKILOTIGA INTEGRATSIYASI: TASHQI SAVDO DIVERSIFIKATSIYASI VA GEOIQTISODIY BARQARORLIK

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Annotatsiya. Maqolada O‘zbekistonning Jahon savdo tashkilotiga (JST) qo‘shilish jarayoni tashqi savdo diversifikatsiyasi va geoiqtisodiy barqarorlik nuqtayi nazaridan tadqiq etilgan. Milliy statistika qo‘mitasining 2019-2025-yillarga oid ma’lumotlari asosida tashqi savdo aylanmasining dinamikasi, o‘rtacha yillik murakkab o‘sish sur’ati, eksportning importni qoplash koeffitsiyenti va asosiy hamkorlar bo‘yicha konsentratsiya ko‘rsatkichlari hisoblangan. Tashqi savdo aylanmasi olti yilda 1,98 barobar kengaygani, ammo Xitoy va Rossiyaning jami ulushi 37,2 foizni tashkil etgani hamda eksportning qariyb uchdan bir qismi oltinga to‘g‘ri kelgani aniqlangan. Muallif JST a’zoligidan olinadigan naf savdo hajmidan ko‘ra savdo tarkibining sifatiga ko‘proq bog‘liq ekanini asoslaydi va tarmoqlar kesimida imkoniyat, xavf va siyosiy javob matritsasini taklif etadi.

Kalit so‘zlar: Jahon savdo tashkiloti, O‘zbekiston, tashqi savdo aylanmasi, eksport diversifikatsiyasi, savdo geografiyasi, konsentratsiya indeksi, global qiymat zanjirlari, geoiqtisodiy barqarorlik.

Аннотация. В статье исследуется процесс присоединения Узбекистана к Всемирной торговой организации (ВТО) с позиций диверсификации внешней торговли и геоэкономической устойчивости. На основе данных Национального комитета по статистике за 2019-2025 гг. рассчитаны динамика внешнеторгового оборота, среднегодовой сложный темп роста, коэффициент покрытия импорта экспортом и показатели концентрации по основным партнерам. Установлено, что за шесть лет товарооборот вырос в 1,98 раза, однако совокупная доля Китая и России составила 37,2%, а почти треть экспорта пришлась на золото. Автор обосновывает, что выгоды от членства в ВТО в большей степени зависят от качества структуры торговли, чем от ее объема, и предлагает отраслевую матрицу возможностей, рисков и мер политики.

Ключевые слова: Всемирная торговая организация, Узбекистан, внешнеторговый оборот, диверсификация экспорта, география торговли, индекс концентрации, глобальные цепочки стоимости, геоэкономическая устойчивость.

Abstract. The article examines Uzbekistan’s accession to the World Trade Organization (WTO) from the perspective of foreign trade diversification and geoeconomic resilience. Using 2019-2025 data of the National Statistics Committee, the study calculates trade turnover dynamics, the compound annual growth rate, the export-to-import coverage ratio and partner concentration indicators. Turnover grew 1.98 times over six years, yet China and Russia jointly accounted for 37.2 percent of it, and gold made up almost a third of exports. The author argues that the gains from WTO membership depend on the quality of the trade structure more than on its volume and proposes a sectoral matrix of opportunities, risks and policy responses.

Keywords: World Trade Organization, Uzbekistan, foreign trade turnover, export diversification, trade geography, concentration index, global value chains, geoeconomic resilience.

KIRISH

So‘nggi yillarda xalqaro savdo tizimida ikki qarama-qarshi jarayon bir vaqtda kechmoqda. Raqamli texnologiyalar va logistika infratuzilmasining kengayishi savdo xarajatlarini kamaytirayotgan bo‘lsa, geosiyosiy ziddiyatlar, proteksionistik choralar va global qiymat zanjirlarining qayta joylashuvi savdo siyosatidagi noaniqlikni kuchaytirmoqda. Bunday sharoitda qoidalarga asoslangan ko‘p tomonlama savdo tizimi kichik va o‘rta iqtisodiyotlar uchun tashqi zarbalardan himoyalanish vositasiga aylanadi. O‘zbekiston ikki karra dengizga chiqish imkoniyati bo‘lmagan mamlakat bo‘lgani uchun uning eksportchilari yuqori

transport xarajatlarini ko‘taradi. Shu sababli savdo rejimining oldindan ma’lum va barqaror bo‘lishi ular uchun qo‘shimcha qiymatga ega. JSTga a’zolik ana shu barqarorlikni institutsional jihatdan mustahkamlash yo‘llaridan biri sifatida qaralmoqda.

O‘zbekiston JSTga a’zolik uchun 1994-yilda ariza bergan, faol muzokaralar esa 2020-yilda qayta tiklangan [2]. Mamlakat a’zolikni 2026-yil mart oyida bo‘lib o‘tgan JSTning 14-vazirlar konferensiyasigacha yakunlashni rejalashtirgan edi, biroq bu muddatga erishilmadi [2]. 2026-yil 27-28-iyulda bo‘lib o‘tgan Ishchi guruhning 13-yig‘ilishida O‘zbekiston delegatsiyasi jarayonni 2026-yil ichida yakunlash maqsadini yana bir bor tasdiqladi [1]. Mart oyidan buyon 190 ta normativ-huquqiy hujjat JST qoidalariga moslashtirilgan, 34 ta ikki tomonlama bozorga kirish kelishuvidan 31 tasi JST Kotibiyatiga topshirilgan [2]. Jahon banki baholariga ko‘ra, a’zolik YaIMni 17 foizgacha oshirishi va kambag‘allik darajasini 1,6 foiz bandgacha qisqartirishi mumkin [3].

Mavzuga oid mavjud ishlarning katta qismi qo‘shilish jarayonining huquqiy va tashkiliy bosqichlarini tavsiflaydi, a’zolikning tashqi savdo tarkibiga qanday ta’sir qilishi esa kamroq o‘rganilgan. Tashqi savdo hajmining o‘sishi bilan uning tarkibi va geografiyasi o‘rtasidagi nomutanosiblik ochiq masala bo‘lib qolmoqda. Shu boisdan tadqiqotning asosiy savoli quyidagicha qo‘yildi: JSTga a’zolik O‘zbekiston tashqi savdosining diversifikatsiyasi va geoiqtisodiy barqarorligiga qanday shartlar mavjud bo‘lganda ijobiy ta’sir ko‘rsatadi? Maqolaning maqsadi 2019-2025-yillardagi tashqi savdo dinamikasi, eksport-import muvozanati va savdo geografiyasini baholash orqali a’zolikning imkoniyat va xavflarini aniqlash hamda ularni boshqarish yuzasidan amaliy takliflar ishlab chiqishdan iborat.

Tadqiqotning ilmiy yangiligi yangilangan statistik qatorlar asosida hisoblangan murakkab o‘sish sur’atini hamkorlar konsentratsiyasi va oltin eksporti ulushi bilan birgalikda talqin qilishda hamda tarmoqlar kesimida imkoniyat, xavf va siyosiy javobni bog‘lovchi matritsani taklif etishda namoyon bo‘ladi. Bunday yondashuv tashqi savdo o‘sishining qaysi qismi tarkibiy o‘zgarishga, qaysi qismi esa narx omillariga tayanganini ajratib ko‘rsatish imkonini beradi.

MAVZUGA OID ADABIYOTLAR TAHLILI

JST a’zoligining savdoga ta’siri borasida ilmiy adabiyotda yakdil fikr shakllanmagan. E.Rouz tortishish modeli asosida a’zolik savdo hajmini ishonchli tarzda oshiradi degan xulosani tasdiqlovchi barqaror dalil topmagan [5]. A.Subramanian va Sh.Vey esa tahlilni mamlakatlar guruhlari bo‘yicha ajratib, JST savdoni kuchli, ammo notekis rag‘batlantirishini ko‘rsatgan: foydaning katta qismi sanoati rivojlangan mamlakatlarga hamda liberallashtirish majburiyatini jiddiyroq olgan yangi a’zolarga to‘g‘ri kelgan [6]. Ikki natija o‘rtasidagi farq, fikrimizcha, o‘rtacha samarani baholash bilan shartli samarani baholash o‘rtasidagi farqdan kelib chiqadi. O‘zbekiston uchun hal qiluvchi savol a’zolik savdoni o‘rtacha hisobda oshiradimi degani emas, qanday ichki shartlar mavjud bo‘lganda oshiradi degan masaladir.

M.Tang va Sh.Vey tashqi majburiyatlarning ishonchlilik qiymatini tahlil qilib, qat’iy qo‘shilish tartibidan o‘tgan mamlakatlarda a’zolikdan keyingi yillarda iqtisodiy o‘sish va investitsiyalar sur’ati tezlashganini aniqlagan [7]. Mualliflar bu samarani islohotlarning ortga qaytarib bo‘lmaydigan holga kelishi bilan izohlaydi. O‘zbekistonning qo‘shilish jarayoni 34 ta ikki tomonlama muzokara va yuzlab huquqiy hujjatlarni moslashtirishni o‘z ichiga olgani sababli ushbu mexanizm unga bevosita tatbiq etiladi [2]. Ammo muallif nazarida bir savol ochiq qoladi. Eksporti xomashyo va qimmatbaho metallarga tayangan iqtisodiyotda ishonchlilik samarasi qayta ishlash tarmoqlariga yetib boradimi? Bu savolning javobi ichki raqobat muhitining holatiga bog‘liq.

Eksport tarkibining sifati masalasini R.Xausmann, J.Xvan va D.Rodrik asoslab bergan: ularning hisob-kitoblariga ko‘ra, murakkabroq mahsulotlarni eksport qiluvchi mamlakatlar keyingi davrda tezroq o‘sadi

[8]. J.Imbs va R.Vaksiarg daromad ortib borishi bilan tarmoqlar tarkibi dastlab diversifikatsiyalashib, yuqori daromad darajasida qayta konsentratsiyalashishini ko‘rsatgan [9]. O.Kado va hammualliflar esa past va o‘rta daromadli mamlakatlarda eksport diversifikatsiyasining asosiy qismi yangi mahsulot va yangi bozorlarning paydo bo‘lishi hisobiga ro‘y berishini aniqlagan [10]. Mazkur uch tadqiqot bir-birini to‘ldiradi. Quyi o‘rta daromadli mamlakatlar guruhiga kiruvchi O‘zbekiston uchun ulardan kelib chiqadigan xulosa shuki, eksport savati hali diversifikatsiya bosqichida turibdi va JST ochadigan bozorlar yangi mahsulot va yangi yo‘nalishlar orqali ta’sir ko‘rsatishi lozim.

MDH mamlakatlari tajribasi bo‘yicha T.Razerford va D.Tarr Rossiyaning JSTga qo‘shilishi uy xo‘jaliklari farovonligiga ta’sirini modellashtirib, asosiy yutuq tariflar pasayishidan emas, xizmatlar sohasidagi xorijiy investitsiyalarga to‘siqlarning olib tashlanishidan kelishini ko‘rsatgan [11]. J.Yensen va D.Tarr Qozog‘iston tajribasida xizmatlar sohasidagi investitsiya to‘siqlari va mahalliy tarkib talablarining bekor qilinishi eng katta samara berishini asoslagan [12]. Jahon bankining 2025-yilgi hisobotida ham O‘zbekistonda xizmatlar savdosini to‘liq liberallashtirish real YaIMni 17 foizgacha oshirishi mumkinligi qayd etilgan [13]. Ikki hujjatdagi raqamlarning mos kelishini inobatga olsak, keng tarqalgan 17 foizlik baho, muallif fikricha, tariflar pasayishining emas, xizmatlar bozori ochilishining natijasi sifatida o‘qilishi kerak. R.Bolduin globallashuvning yangi bosqichida savdo ishlab chiqarish zanjirlari orqali tashkil topishini, bu esa standartlar, intellektual mulk va investitsiya kafolatlarini tariflardan ham muhimroq qilib qo‘yishini ta’kidlaydi [14]. Milliy darajada eksport tarkibi va geografiyasini diversifikatsiya qilish vazifasi 2017-yilda qabul qilingan Harakatlar strategiyasida belgilab berilgan [15].

TADQIQOT METODOLOGIYASI

Tadqiqotning axborot bazasini Milliy statistika qo‘mitasining SIAT ma’lumotlar bazasidagi tashqi savdo aylanmasining yillik qatori [16], qo‘mitaning 2025-yil yakunlari bo‘yicha dastlabki xabari [17], JST Kotibiyatining rasmiy xabarlari [1, 4] hamda Jahon bankining O‘zbekiston bo‘yicha baholari [3] tashkil etadi. Asosiy tahlil davri 2019-2025-yillarni qamrab oladi. 2026-yilning yanvar-iyul oylariga oid dastlabki ma’lumotlar tendensiyani tekshirish maqsadida qo‘shimcha ravishda jalb qilindi [23, 24].

Dinamik tahlilda zanjirli o‘sish sur’atlari va o‘rtacha yillik murakkab o‘sish sur’ati (CAGR) hisoblandi:

$$CAGR = (TSA2025 / TSA2019)1/n − 1, \quad (1)$$

bu yerda TSA tashqi savdo aylanmasi, n davrdagi yillar soni (n = 6). Eksport-import muvozanati eksportning importni qoplash koeffitsiyenti orqali baholandi:

$$\boldsymbol{K = E / I \times 100\%,} \quad \boldsymbol{(2)}$$

bu yerda E eksport hajmi, I import hajmi. Savdo geografiyasining konsentratsiyasi birinchi ikki va birinchi besh hamkorning jami ulushi (CR2, CR5) hamda birinchi beshta hamkor bo‘yicha qisman Xerfindal-Xirshman indeksi yordamida o‘lchandi:

$$HHI5 = \Sigma\, si2, \quad (3)$$

bu yerda si i-hamkorning tashqi savdo aylanmasidagi foiz ulushi. Qolgan hamkorlar hisobga olinmagani sababli (3) formula konsentratsiyaning quyi chegarasini beradi. Tarmoqlar bo‘yicha JST ta’siri sifat jihatidan qiyosiy tahlil asosida matritsa shaklida baholandi.

Ma’lumotlar bilan ishlashda bir uslubiy jihatni ochiq qayd etish zarur. Dinamik qator uchun 2026-yil 15-iyulda yangilangan SIAT qatori olingan va unda 2025-yilgi aylanma 82,76 mlrd dollarni tashkil etadi [16]. Eksport va import ko‘rsatkichlari esa 2026-yil 22-yanvardagi dastlabki xabarga tayanadi va u yerda jami aylanma 81,2 mlrd dollar deb berilgan [17, 20]. Ikki manba o‘rtasidagi 1,56 mlrd dollarlik farq

ma’lumotlarning qayta ko‘rib chiqilishi bilan izohlanadi, shu bois nisbiy ko‘rsatkichlar har bir manbaning o‘z jami qiymatiga nisbatan hisoblandi.

TAHLIL VA NATIJALAR

Tashqi savdo aylanmasining dinamikasi

Tashqi savdo hajmi mamlakatning jahon xo‘jaligiga qo‘shilish darajasini aks ettiruvchi dastlabki ko‘rsatkichdir. Ammo bu ko‘rsatkich bir necha yil kesimida olinmasa, tasodifiy tebranishlar tarkibiy o‘zgarish sifatida qabul qilinishi mumkin. Shu sababli tahlil pandemiyadan oldingi 2019-yildan boshlandi. 2019-2025-yillarda O‘zbekiston tashqi savdo aylanmasining o‘zgarishi 1-jadvalda keltirilgan.

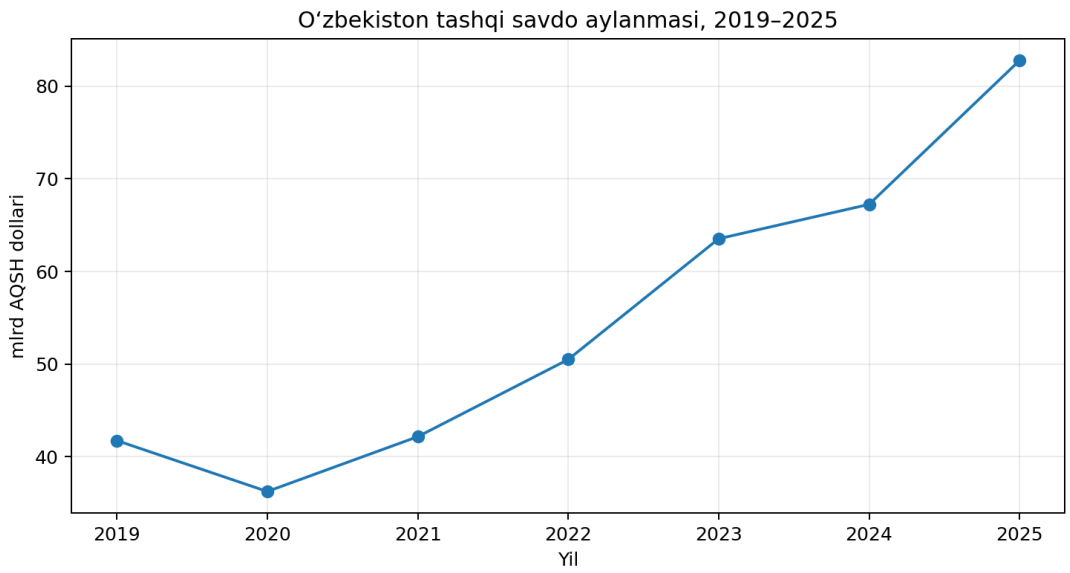
1-jadval.

O‘zbekiston tashqi savdo aylanmasining 2019-2025-yillardagi dinamikasi

Yil	Tashqi savdo, mlrd $	Yillik o‘sish, %	Izoh
2019	41,75	x	
2020	36,26	-13,2	Pandemiya davri
2021	42,17	16,3	Tiklanish
2022	50,50	19,8	
2023	63,53	25,8	
2024	67,24	5,8	
2025	82,76	23,1	

Manba: O‘zbekiston Respublikasi Milliy statistika qo‘mitasi SIAT ma’lumotlari [16] asosida muallif hisob-kitobi.

1-jadval ma’lumotlari shuni ko‘rsatadiki, tashqi savdo aylanmasi olti yil ichida 41,75 mlrd dollardan 82,76 mlrd dollargacha, ya’ni 41,01 mlrd dollarga ko‘paygan. (1) formula bo‘yicha o‘rtacha yillik murakkab o‘sish sur’ati 12,1 foizni tashkil etadi. Mazkur dinamika 1-rasmda yaqqol ko‘rinadi.



1-rasm. O‘zbekiston tashqi savdo aylanmasining 2019-2025-yillardagi dinamikasi, mlrd AQSh dollari

Manba: [16] ma’lumotlari asosida muallif tomonidan tuzilgan.

O‘sish traektoriyasi bir tekis kechmagan. 2020-yilda aylanma 13,2 foizga qisqargan va bu pasayish pandemiya davridagi chegaraviy cheklovlar hamda tashqi talabning susayishi bilan bog‘liq. Keyingi uch yilda o‘sish sur’ati 16,3 foizdan 25,8 foizgacha tezlashgan, natijada 2023-yildagi aylanma 2019-yil darajasidan 1,52 barobar yuqori bo‘lgan. Demak, tiklanish faqat pandemiya yo‘qotishlarini qoplash bilan cheklanmagan. 2024-yilda sur’at 5,8 foizgacha sekinlashgan. Dastlabki ma’lumotlarga ko‘ra, o‘sha yili eksport 8,4 foizga oshgani holda import atigi 0,8 foizga ko‘paygan, avtomobil va butlovchi qismlar importi esa 25,7 foizga qisqargan [22]. Bundan kelib chiqadiki, 2024-yilgi sekinlashuvning asosiy sababi import talabining vaqtincha susayishida bo‘lgan. 2025-yilda sur’at yana 23,1 foizgacha tiklangan.

2025-yilgi o‘sishning manbai alohida tekshiruvni talab qiladi. O‘sha yili 9,9 mlrd dollarlik oltin sotilgan va u umumiy eksportning 29,3 foizini tashkil etgan [20, 21]. Oltin eksporti 2024-yilga nisbatan 32,3 foizga oshgan [21], muallif hisobiga ko‘ra, eksportning 6,5 mlrd dollarlik mutlaq o‘sishining qariyb 37 foizi oltin hisobiga to‘g‘ri keladi. Oltin narxi jahon bozorida shakllanadi va O‘zbekiston unga ta’sir ko‘rsata olmaydi, shu sababli aylanmaning bu qismi tarkibiy o‘zgarishdan ko‘ra narx konyunkturasini aks ettiradi. Bu xulosani 2026-yil boshidagi ma’lumotlar ham tasdiqlaydi: yanvar-aprel oylarida umumiy eksport 16,8 foizga kamaygan, oltinsiz eksport esa 28,7 foizga oshgan [23]. Qisqa muddatda bunday tebranish savdo balansini beqarorlashtiradi. Uzoq muddatda esa qayta ishlangan mahsulotlar eksportining barqaror o‘sishi tashqi savdoning haqiqiy sifat ko‘rsatkichiga aylanadi.

Shunday qilib, 12,1 foizlik o‘rtacha sur’at mamlakatning tashqi bozorlarga integratsiyasi chuqurlashganini ko‘rsatsa-da, uning bir qismi xomashyo narxlari bilan belgilanadi. JST a’zoligining samarasini keyinchalik baholashda narx omilidan tozalangan ko‘rsatkich kerak bo‘ladi, aks holda oltin narxining o‘zgarishi integratsiya natijasi sifatida noto‘g‘ri talqin qilinishi mumkin. Milliy statistika qo‘mitasi oltinsiz eksportni qayta ishlash darajasi bo‘yicha ajratilgan yillik qator sifatida SIAT bazasida yuritsa, tadqiqotchilar va davlat idoralari a’zolikdan oldingi va keyingi davrni bir xil asosda solishtirish imkoniga ega bo‘ladi.

2025-yildagi eksport-import muvozanati va savdo geografiyasi. Savdo hajmi o‘sgani sari uning ichki tuzilmasi, xususan eksport va import o‘rtasidagi nisbat ko‘proq ahamiyat kasb etadi. Import eksportdan yuqori bo‘lgan holat har doim ham zaiflik belgisi hisoblanmaydi, chunki kapital tovarlar va oraliq mahsulotlar importi kelajakdagi eksport salohiyatini shakllantiradi. Ammo importning tarkibi nazoratdan chetda qolsa, taqchillik iste’mol talabini moliyalashtirishga aylanib ketishi ham mumkin. 2025-yil yakunlari bo‘yicha eksport, import va savdo balansi 2-jadvalda keltirilgan.

2-jadval.

O‘zbekistonning 2025-yildagi asosiy tashqi savdo ko‘rsatkichlari

Ko‘rsatkich	2025, mlrd $	2024-yilga nisbatan o‘sish, %
Tashqi savdo aylanmasi	82,76	x
Eksport	33,8	24,0*
Import	47,4	18,5*
Savdo balansi	-13,6	x

*Manba: tashqi savdo aylanmasi [16], eksport va import [17] ma’lumotlari asosida. * O‘sish sur’atlari Milliy statistika qo‘mitasining 2026-yil 22-yanvardagi dastlabki xabaridan olingan, ushbu xabarda jami aylanma 81,2 mlrd dollar deb ko‘rsatilgan.*

2-jadval ma’lumotlari shuni ko‘rsatadiki, eksport importdan tezroq o‘sgan bo‘lsa-da, mutlaq hajmdagi farq saqlanib qolgan va savdo balansining manfiy saldosi 13,6 mlrd dollarni tashkil etgan. (2) formula bo‘yicha eksportning importni qoplash koeffitsiyenti 71,3 foizga teng.

Eksport importdan 5,5 foiz band tezroq o‘sganiga qaramay, nega taqchillik qisqarmadi? Javob boshlang‘ich bazalar farqida yashiringan. Import hajmi eksportdan 1,4 barobar katta bo‘lgani uchun uning 18,5 foizlik o‘sishi taxminan 7,4 mlrd dollar qo‘shimcha hajm bergan, eksportning 24 foizlik o‘sishi esa 6,5 mlrd dollarni tashkil etgan (muallif hisobi). Taqchillik dastlabki ma’lumotlarga ko‘ra jami aylanmaning 16,7 foiziga teng bo‘lgan. Jahon banki import o‘sishini energiya resurslari, mashina-uskunalar va oraliq tovarlar xaridining ortishi bilan izohlaydi [3], bu esa taqchillikning muayyan qismi investitsion xususiyatga ega ekanini bildiradi. Joriy operatsiyalar hisobining taqchilligi 2024-yildagi YaIMning 4,7 foizidan 2025-yilda 3,3 foizigacha qisqargan [3], demak, pul o‘tkazmalari va xizmatlar savdosi tovar savdosidagi nomutanosiblikni qisman qoplagan. Shunga qaramay, import qilingan uskunalar qanchalik tez eksport qiluvchi quvvatlarga aylanishi hozircha isbotlanmagan va bu bog‘liqlik bahsli bo‘lib qolmoqda. Iqtisodiyot va moliya vazirligi yirik investitsiya loyihalari bo‘yicha import qilingan uskunalarning eksport natijasini loyiha ishga tushganidan keyingi uch yil davomida kuzatib borsa, importning iqtisodiy funksiyasi dalil asosida baholanadi.

Tashqi savdoning geografik tuzilmasi geoiqtisodiy barqarorlikning bevosita o‘lchovidir. Savdo hamkorlari soni 2025-yilning yanvar-avgust oylaridagi 200 tadan [18] yanvar-oktabr oylarida 210 taga yetgan [19], ammo hamkorlar sonining o‘zi ular o‘rtasida ulushlar qanday taqsimlanganini ko‘rsatmaydi. Bir necha yirik hamkorga tayanish logistika xarajatlarini kamaytirsa-da, ular iqtisodiyotidagi har qanday o‘zgarishni ichki bozorga tez uzatadi. Asosiy savdo hamkorlarining tashqi savdo aylanmasidagi ulushi 3-jadvalda keltirilgan.

3-jadval.

O‘zbekiston tashqi savdo aylanmasida asosiy hamkorlarning ulushi, 2025-yil

Savdo hamkori	Tashqi savdo ulushi, %
Xitoy	21,2
Rossiya	16,0
Qozog‘iston	6,1
Turkiya	3,7
Koreya Respublikasi	2,1

Manba: O‘zbekiston Respublikasi Milliy statistika qo‘mitasining 2025-yil tashqi savdo ma’lumotlari [17, 20].

3-jadval ma’lumotlari shuni ko‘rsatadiki, birinchi ikki hamkor aylanmaning 37,2 foizini, birinchi beshtasi esa 49,1 foizini egallaydi. (3) formula bo‘yicha qisman Xerfindal-Xirshman indeksi 760,8 punktga teng bo‘lib, uning 92,7 foizi Xitoy va Rossiya hissasiga to‘g‘ri keladi.

Xitoyning ulushi Rossiyanikidan 1,33 barobar yuqori, uchinchi, to‘rtinchi va beshinchi o‘rindagi hamkorlarning jami ulushi esa atigi 11,9 foizni tashkil etadi. Bu tuzilma ikki yirik bozorga geografik yaqinlik, mavjud transport yo‘laklari va Xitoydan mashina-uskunalar importining yuqoriligi bilan izohlanadi. 2024-yilda Xitoy bilan 12,48 mlrd dollarlik savdoning 10,43 mlrd dollari import bo‘lgan [22], ya’ni bu yo‘nalishdagi konsentratsiya asosan import tomonida shakllangan. Konsentratsiyaning qisqa muddatli oqibati hamkor mamlakatdagi talab yoki valyuta kursi o‘zgarishining ichki narxlar va ishlab chiqarish xarajatlariga tez o‘tishida ko‘rinadi. Uzoq muddatda esa texnologik bog‘liqlik bitta yetkazib beruvchi mamlakat standartlariga o‘rnashib qolishi mumkin.

Ko‘rsatkichning yo‘nalishi ham xavotirli. 2026-yilning yanvar-iyul oylarida Xitoy ulushi 22,7 foizga, Rossiya ulushi 16,4 foizga yetib, ularning jami ulushi 39,1 foizni tashkil etgan [24]. Ikki hamkorning ulushi bir yil ichida 1,9 foiz bandga ortgan, demak, hozirgi savdo oqimlarida diversifikatsiya emas, konsentratsiya kuchaymoqda. 2025-yilda Koreya Respublikasi bilan savdo 14 foizga, Turkiya bilan 0,4 foizga, AQSh bilan 2 foizga qisqargan, Shveytsariya bilan savdo 84 foizga, BAA bilan esa 52,7 foizga oshgan [20]. Shveytsariya va BAA yo‘nalishidagi o‘sish oltin savdosi bilan bog‘liq bo‘lishi ehtimoli yuqori, ammo mavjud ma’lumotlar tovar tarkibini ko‘rsatmagani sababli muallif bu fikrni tasdiqlangan xulosa emas, gipoteza sifatida qayd etadi. Investitsiyalar, sanoat va savdo vazirligi Yevropa Ittifoqi, Janubiy va Janubi-Sharqiy Osiyo bozorlari uchun oltinsiz eksport ulushi bo‘yicha yillik maqsadli ko‘rsatkich belgilasa, diversifikatsiya siyosatining natijasini o‘lchash imkoniyati paydo bo‘ladi.

JST a’zoligining imkoniyatlari va tarmoq xavflari. JST qoidalariga moslashish eksportchilar uchun texnik reglamentlar, sertifikatlash hamda sanitariya va fitosanitariya (SPS) talablarini oldindan ma’lum qiladi. Bu omilning amaliy qiymatini bitta misol yaxshi ko‘rsatadi. O‘zbekiston Savdo-sanoat palatasi raisi D.Vahobovning ma’lumotiga ko‘ra, Vyetnamda o‘zbek bo‘yalgan matolariga 30 foizlik import boji qo‘llanadi, turk ishlab chiqaruvchilari esa nol tarif bilan savdo qiladi [25]. A’zolik bunday kamsituvchi farqni bartaraf etish uchun huquqiy asos yaratadi. Palata baholashicha, eksportchilar soni avvalgi 200-300 tadan 6-7 mingtagacha ko‘paygan [25]. Bu raqam bozorga kirish shartlari yaxshilanganda undan foydalana oladigan subyektlar doirasi ancha kengayganini bildiradi.

Oldindan ma’lum savdo rejimi xorijiy investorlar uchun huquqiy noaniqlikni kamaytiradi va Tang hamda Vey aniqlagan ishonchlilik samarasi shu kanal orqali ishlaydi [7]. Biroq investitsiya hajmining o‘zi yetarli emas. Mahalliylashtirish darajasi, texnologiya transferi va mahalliy yetkazib beruvchilar bilan kooperatsiya investitsiya sifatining asosiy mezonlari bo‘lishi kerak. Jahon banki mamlakatda 2 mingga yaqin davlat korxonasi faoliyat yuritishi va ularning daromadi YaIMning qariyb 30 foiziga tengligini qayd etib, raqobat sharoitlarini tenglashtirishni ustuvor vazifa deb hisoblaydi [26]. Davlat korxonalari ulushi yuqori bo‘lgan tarmoqlarda xususiy investorning global qiymat zanjiriga ulanish imkoniyati cheklanib qoladi.

JST muzokaralari tariflardan tashqari xizmatlar, subsidiyalar, davlat savdosi, intellektual mulk va texnik to‘siqlarni ham qamrab oladi. 2026-yil mart oyidan buyon moslashtirilgan 190 ta hujjatning katta qismi SPS choralari va oziq-ovqat xavfsizligiga tegishli bo‘lib, antidemping, kompensatsion va himoya choralari to‘g‘risidagi qonun loyihalari yangilangan, yagona Oziq-ovqat xavfsizligi qo‘mitasi tashkil etilgan [2]. Shunga qaramay, JST a’zolari bir qator asosiy qonunlarning qabul qilinishi kutilganidan sekin kechayotganini qayd etgan [2]. Muallif fikricha, bu kechikish savdo huquqi va iqtisodiy modellashtirish bo‘yicha mutaxassislar salohiyati bilan ham bog‘liq bo‘lishi mumkin, ammo buni tasdiqlovchi rasmiy ma’lumot e’lon qilinmagan.

Savdo geografiyasining kengayishi ayrim hamkorlarga haddan tashqari bog‘liqlikni kamaytiradi. 3-jadvaldagi konsentratsiya darajasi Yevropa Ittifoqi, Yaqin Sharq, Janubiy va Janubi-Sharqiy Osiyo bozorlarida yangi imkoniyatlar izlashni zaruratga aylantiradi. JST a’zoligi bu bozorlarda eng ko‘p qulaylik rejimini kafolatlaydi, shu bois muzokara resurslarini tarif imtiyozlaridan ko‘ra standartlarni o‘zaro tan olish va logistika kelishuvlariga yo‘naltirish mumkin bo‘ladi.

A’zolik barcha tarmoqlarga teng foyda keltirmaydi. Import raqobatining kuchayishi mahsuldorligi past va xalqaro standartlarga moslashmagan korxonalar uchun qisqa muddatli bosimni oshiradi. Shu sababli savdo liberallashuvi ishlab chiqarish samaradorligi, standartlashtirish, eksport marketingi va mehnat resurslarini qayta tayyorlash siyosati bilan uyg‘un holda olib borilishi zarur. Tanlangan tarmoqlar bo‘yicha imkoniyat, asosiy xavf va siyosiy javob 4-jadvalda keltirilgan.

4-jadval.

JST a’zoligining tarmoqlar kesimidagi imkoniyat va xavflari matritsasi

Yo‘nalish	Imkoniyat	Asosiy xavf	Siyosiy javob
To‘qimachilik	Eksport va qayta ishlash	Kuchli import raqobati	Standart, brend va mahsuldorlik
Qishloq xo‘jaligi	Yangi bozorlar	SPS talablari	Sertifikatlash va logistika
Avtomobilsozlik	Ta’minot zanjirlari	Import raqobati	Raqobatbardoshlik va lokal kooperatsiya
Kimyo	Yuqori qo‘shilgan qiymat	Texnologik bosim	Texnologiya transferi
Xizmatlar	Raqamli eksport	Xalqaro raqobat	Raqamlashtirish va malaka

Manba: muallif ishlanmasi.

4-jadval ma’lumotlari shuni ko‘rsatadiki, ko‘rib chiqilgan beshta yo‘nalishning uchtasida asosiy xavf import yoki xalqaro raqobat bilan bog‘liq, qishloq xo‘jaligida esa xavf tariflardan emas, SPS talablaridan kelib chiqadi.

Matritsadan ikki turdagi moslashuv mantig‘i kelib chiqadi. To‘qimachilik va avtomobilsozlikda siyosiy javob mahsuldorlik va mahalliy kooperatsiyani oshirishga qaratilgan, chunki tarif himoyasi pasayganda bu tarmoqlarning raqobatbardoshligi bevosita tannarx darajasiga bog‘liq bo‘lib qoladi. Qishloq xo‘jaligi va kimyo sanoatida esa hal qiluvchi omil institutsional xususiyatga ega, ya’ni sertifikatlash tizimi va texnologiya transferi birinchi o‘ringa chiqadi. 2024-yilda avtomobil va butlovchi qismlar importi 3,33 mlrd dollarni tashkil etgan [22], bu raqam tariflar pasaygandan keyin ichki bozordagi raqobat bosimi qanchalik katta bo‘lishi mumkinligini ko‘rsatadi. Razerford va Tarr Rossiya tajribasida eng katta yutuq manbai xizmatlar sohasi ekanini aniqlagan [11], shuning uchun matritsada xizmatlar uchun raqamlashtirish va malaka asosiy javob sifatida berilgan. Qisqa muddatda qaysi tarmoq ko‘proq yo‘qotishi haqida aniq miqdoriy baho mavjud emas, shu sababli matritsa prognoz emas, monitoring yo‘nalishlarini belgilovchi vosita sifatida taklif etiladi. Iqtisodiyot va moliya vazirligi tarmoq uyushmalari bilan birgalikda har bir yo‘nalish bo‘yicha tarif, import ulushi, bandlik va eksport ko‘rsatkichlarini a’zolikdan oldingi va keyingi davr uchun kuzatib borsa, himoya choralarini JST qoidalariga mos ravishda o‘z vaqtida qo‘llash imkoniyati yuzaga keladi.

MUHOKAMA

Tahlil natijalari O‘zbekiston uchun JST a’zoligining asosiy qiymati savdo hajmini oshirishdan ko‘ra savdo sifatini o‘zgartirishda ekanini ko‘rsatadi. 2019-2025-yillarda aylanma qariyb ikki barobar kengaygan, ammo bu o‘sishning sezilarli qismi oltin narxi va import talabidagi tebranishlar bilan bog‘liq. Rouz hamda Subramanian va Vey o‘rtasidagi bahs [5, 6] O‘zbekiston sharoitida quyidagicha talqin qilinishi mumkin: a’zolik savdo hajmini avtomatik oshirmaydi, ammo liberallashtirish majburiyatlari qat’iy bo‘lgan va ichki islohotlar bilan mustahkamlangan holatda samara beradi. JST Bosh direktori o‘rinbosari Chjan Syanchen Ishchi guruh yig‘ilishida quyidagi fikrni bildirgan: “WTO accession can help economies build resilience by anchoring an economy-wide reform process” (JSTga a’zolik butun iqtisodiyotni qamrab oluvchi islohotlar jarayoniga tayanch bo‘lib, iqtisodiyotlarning barqarorligini oshirishga yordam berishi mumkin) [2]. Bu fikr muallifning pozitsiyasiga yaqin, biroq unda islohotlar a’zolikdan keyin ham davom etishi kerakligi haqidagi shart yashiringan.

Geografik konsentratsiya ikkinchi muhim masaladir. Xitoy va Rossiyaning 37,2 foizlik ulushi yirik bozor va logistika afzalligini beradi, ammo tashqi talab, geosiyosiy vaziyat yoki hamkor mamlakat savdo siyosatidagi o‘zgarishlarning ichki iqtisodiyotga uzatilishini ham kuchaytiradi. 2026-yilgi ma’lumotlarda bu ulushning 39,1 foizga oshgani [24] hozirgi savdo oqimlari o‘z-o‘zidan diversifikatsiyaga yo‘nalmaganini

ko‘rsatadi, demak, a’zolik ham maxsus strategiyasiz bu yo‘nalishni o‘zgartirishi dargumon. Jahon bankining 17 foizlik bahosi [3] ham avtomatik natija emas, u xizmatlar bozorining ochilishi, investitsiya muhiti va davlat korxonalari islohotiga bog‘liq [13, 26]. Kambag‘allik darajasining 1,6 foiz bandgacha qisqarishi haqidagi baho a’zolik foydasi aholining keng qatlamlariga yetib borishi mumkinligini ko‘rsatadi, lekin bu natija qaysi hududlar va ijtimoiy guruhlar hisobiga ro‘y berishi hozircha ochiq savol bo‘lib qolmoqda.

XULOSA VA TAKLIFLAR

O‘zbekistonning JSTga integratsiyasi tashqi savdo siyosatini yangi institutsional bosqichga olib chiqishi mumkin. 2019-2025-yillarda tashqi savdo aylanmasi 41,75 mlrd dollardan 82,76 mlrd dollargacha oshib, o‘rtacha yillik 12,1 foiz sur’atda o‘sgan. Ammo 2025-yilgi eksportning 29,3 foizi oltinga to‘g‘ri kelgani, eksportning importni qoplash koeffitsiyenti 71,3 foiz bo‘lgani va ikki yirik hamkorning ulushi 37,2 foizdan 39,1 foizga oshgani savdo o‘sishining sifat jihatidan hali muvozanatlashmaganini ko‘rsatadi. Tadqiqotning asosiy xulosasi shundan iboratki, a’zolikning muvaffaqiyati a’zolikning o‘zidan ko‘ra unga parallel va undan keyin olib boriladigan ichki siyosatga ko‘proq bog‘liq.

Olingan natijalar asosida bir qator takliflar ilgari suriladi. Eksport diversifikatsiyasini JST strategiyasi bilan bog‘lash uchun Investitsiyalar, sanoat va savdo vazirligi oltinsiz eksport ulushini hamda qayta ishlangan sanoat mahsulotlari, agro-oziq-ovqat va raqamli xizmatlar eksportini asosiy maqsadli ko‘rsatkich sifatida belgilashi maqsadga muvofiq. Savdo geografiyasini kengaytirishda Xitoy va Rossiya bilan aloqalarni saqlagan holda Yevropa Ittifoqi, Yaqin Sharq, Janubiy va Janubi-Sharqiy Osiyo bozorlari uchun eksport sug‘urtasi va standartlarni o‘zaro tan olish kelishuvlariga ustuvorlik berilishi kerak, bu choralar o‘rta muddatda CR2 ko‘rsatkichini pasaytirishga xizmat qiladi.

Mahalliy korxonalarni raqobatga tayyorlash maqsadida kichik va o‘rta biznes uchun sertifikatlash, texnik standartlar, eksport marketingi va xalqaro elektron savdo bo‘yicha amaliy ko‘makni kengaytirish lozim. Importni hajmi bo‘yicha emas, iqtisodiy funksiyasi bo‘yicha baholash tizimi joriy etilsa, kapital tovarlar va oraliq mahsulotlar importining eksport salohiyatiga qo‘shgan hissasi aniq o‘lchanadi, samarasiz importga nisbatan esa JST qoidalariga mos himoya vositalarini qo‘llash imkoniyati saqlanadi. Tarmoqlar kesimida a’zolikdan oldingi va keyingi davr uchun tarif, import raqobati, eksport, bandlik va investitsiya ko‘rsatkichlarining doimiy monitoringi yo‘lga qo‘yilsa, 4-jadvalda taklif etilgan matritsa amaliy boshqaruv vositasiga aylanadi. Keyingi tadqiqotlarda tortishish modeli yordamida JST a’zoligining tarmoqlar bo‘yicha miqdoriy ta’sirini baholash ilmiy jihatdan istiqbolli yo‘nalish hisoblanadi.

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QISHLOQ XO‘JALIGI MAHSULOTLARI TA’MINOT ZANJIRINI TAKOMILLASHTIRISHNING IQTISODIY ASOSLARI

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Annotatsiya. Agrologistika tizimi qishloq xo‘jaligini raqamli tarzda transformatsiya qilishda muhim rol o‘ynaydi. Ushbu maqolada agrologistika tizimining iqtisodiy jihatlari, uning qishloq xo‘jaligi ishlab chiqarishidagi o‘rni va samaradorligi tahlil qilinadi. Agrologistika orqali resurslarni samarali boshqarish va yetkazib berish zanjirini optimallashtirish orqali qishloq xo‘jaligi mahsulotlarining sifatini oshirish, xarajatlarni kamaytirish va iqtisodiy foydani ko‘paytirish mumkin.

Agrologistika tizimida innovatsion texnologiyalar, masalan, aqlli qishloq xo‘jaligi yechimlari, muhim ahamiyatga ega. Ushbu texnologiyalar yordamida fermerlar o‘z mahsulotlarini rejalashtirish, monitoring qilish va boshqarish imkoniyatiga ega bo‘ladilar. Shuningdek, agrologistika tizimining rivojlanishi qishloq xo‘jaligi sohasidagi raqobatbardoshligini oshirishga xizmat qiladi.

Maqolada agrologistika tizimining rivojlanishi uchun zarur bo‘lgan iqtisodiy asoslar, yangi texnologiyalarning joriy etilishi va davlat siyosatining roli muhokama qilinadi. Davlat tomonidan qo‘llab-quvvatlash, subsidiyalar va innovatsion dasturlar orqali agrologistika tizimini rivojlantirishga katta e’tibor berilishi zarur.

Shuningdek, maqola agrologistika tizimining amalga oshirilishi jarayonida yuzaga keladigan muammolar va ularni hal qilish yo‘llarini ham ko‘rib chiqadi. Bu orqali agrologistika modelining samaradorligini oshirish va qishloq xo‘jaligi mahsulotlarining barqarorligini ta’minlash mumkin.

Kalit so‘zlar: Agrologistika, iqtisodiy asoslar, qishloq xo‘jaligi, raqamli transformatsiya, yetkazib berish zanjiri, resurslarni boshqarish, samaradorlik.

Abstract. The agrologistics system plays a crucial role in the digital transformation of agriculture. This article analyzes the economic aspects of the agrologistics system, its role in agricultural production, and its efficiency. Through agrologistics, effective resource management and optimization of the supply chain can enhance the quality of agricultural products, reduce costs, and increase economic benefits. Innovative technologies, such as smart agriculture solutions, hold significant importance within the agrologistics system. These technologies enable farmers to plan, monitor, and manage their products effectively. Furthermore, the development of the agrologistics system contributes to increasing competitiveness in the agricultural sector.

The article discusses the economic foundations necessary for the development of the agrologistics system, the introduction of new technologies, and the role of state policy. It is essential to provide substantial support from the government, including subsidies and innovative programs, to enhance the agrologistics system. Additionally, the article examines the challenges that arise during the implementation of the agrologistics system and explores ways to address them. This approach can improve the effectiveness of the agrologistics model and ensure the sustainability of agricultural products.

Keywords: agrologistics, economic foundations, agriculture, digital transformation, supply chain, resource management, efficiency.

Аннотация. Система агрологистики играет важную роль в цифровой трансформации сельского хозяйства. В данной статье анализируются экономические аспекты системы агрологистики, ее роль в производстве сельскохозяйственной продукции и эффективность. С помощью агрологистики можно эффективно управлять ресурсами и оптимизировать цепочку поставок, что позволит повысить качество сельскохозяйственной продукции, снизить затраты и увеличить экономическую выгоду. Инновационные технологии, такие как решения для умного сельского хозяйства, имеют значительное значение в системе агрологистики. Эти технологии позволяют фермерам эффективно планировать, контролировать и управлять своей продукцией.

Кроме того, развитие системы агрологистики способствует повышению конкурентоспособности в сельскохозяйственном секторе.

В статье рассматриваются экономические основы, необходимые для развития системы агрологистики, внедрение новых технологий и роль государственной политики. Важно обеспечить значительную поддержку со стороны государства, включая субсидии и инновационные программы, для улучшения системы агрологистики. Также статья исследует проблемы, возникающие в процессе реализации системы агрологистики, и предлагает способы их решения. Такой подход может повысить эффективность модели агрологистики и обеспечить устойчивость сельскохозяйственной продукции.

Ключевые слова: агрологистика, экономические основы, сельское хозяйство, цифровая трансформация, цепочка поставок, управление ресурсами, эффективность, инновации, государственная политика.

Kirish.

Agrologistika, qishloq xo‘jaligi va logistika jarayonlarini birlashtiruvchi zamonaviy va innovatsion bir yo‘nalish bo‘lib, uning asosiy maqsadi resurslarni samarali boshqarish, mahsulotlar yetkazib berish zanjirini optimallashtirish va qishloq xo‘jaligi faoliyatini raqamli transformatsiya qilishdan iboratdir. Bugungi kunda global iqtisodiyotda qishloq xo‘jaligining o‘rni va ahamiyati yanada ortib bormoqda. Ushbu jarayonlar doirasida agrologistika tizimi qishloq xo‘jaligi sohasida iqtisodiy samaradorlikni oshirish, xarajatlarni kamaytirish va mahsulotlarning sifatini yaxshilashda muhim rol o‘ynamoqda.

Agrologistika tizimi orqali fermerlar o‘z faoliyatlarini yanada samarali va raqobatbardosh amalga oshira olishlari uchun zaruriy bilim va vositalarga ega bo‘lishlari zarur. Shu bilan birga, agrologistika iqtisodiy asoslarini tushunish, innovatsion texnologiyalarni joriy etish va davlat siyosatining qo‘llab-quvvatlashi bu tizimni yanada rivojlantirishning kalitidir. Agrologistika sohasida raqamli texnologiyalar, avtomatizatsiya va aqlli yechimlar yordamida resurslar boshqaruvi va yetkazib berish zanjirini optimallashtirish fermerlarga o‘z mahsulotlari sifatini oshirish, xarajatlarni kamaytirish va bozor talablariga tezda javob berishga yordam beradi.

Shuningdek, agrologistika tizimining iqtisodiy asoslari, ta’minot zanjirini boshqarish, xarid qilish va tarqatish jarayonlaridagi samaradorlikni oshirishga qaratilgan strategiyalarni o‘z ichiga oladi. Davlat tomonidan qo‘llab-quvvatlash, subsidiyalar va innovatsion dasturlar orqali agrologistika tizimini rivojlantirish uchun zarur shart-sharoitlar yaratilishi lozim. Masalan, qishloq xo‘jaligi ishlab chiqaruvchilariga xizmat ko‘rsatish va raqobatbardosh mahsulotlar ishlab chiqarish uchun zarur bo‘lgan resurslarni taqdim etish orqali davlat agrologistika tizimini mustahkamlashi mumkin.

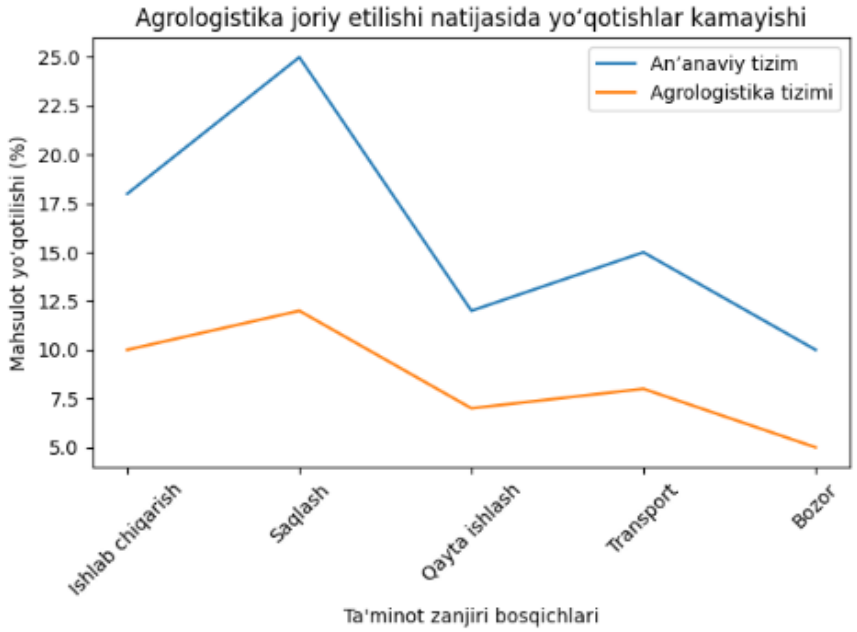
Ushbu maqolada agrologistika tizimini rivojlantirishning iqtisodiy asoslari, shuningdek, bu jarayonda yuzaga keladigan muammolar va ularni hal qilish yo‘llari tahlil qilinadi. Agrologistika tizimining qishloq xo‘jaligiga ta’siri va uning kelajakda rivojlanishi uchun zarur bo‘lgan strategiyalar muhokama qilinadi. Maqola agrologistika tizimining samarali rivojlanishi uchun imkoniyatlar va tavsiyalarni taqdim etishga qaratilgan.

I. Agrologistika tizimining mohiyati va iqtisodiy ahamiyati

Agrologistika – bu qishloq xo‘jaligi mahsulotlarini ishlab chiqarishdan tortib iste’molchigacha bo‘lgan barcha jarayonlarni yagona boshqaruv tizimi asosida tashkil etuvchi murakkab iqtisodiy va tashkiliy tizimdir. Uning asosiy maqsadi – ishlab chiqarishdan taqsimotgacha bo‘lgan bosqichlarda resurslardan samarali foydalanish, vaqtni tejash, transport xarajatlarini kamaytirish hamda mahsulot sifatini saqlab qolish orqali iqtisodiy foydani oshirishdir.

Agrologistika tizimining iqtisodiy mohiyatini chuqur tahlil qilganda, u nafaqat mahsulot aylanmasini tezlashtiruvchi vosita, balki qishloq xo‘jaligi ishlab chiqaruvchilarining daromadini barqarorlashtiruvchi iqtisodiy mexanizm sifatida ham namoyon bo‘ladi. Ushbu tizim orqali ishlab chiqarish jarayonida

sarflanadigan resurslar — energiya, yoqilg‘i, ishchi kuchi va transport vositalari — aniq rejalashtiriladi. Natijada, ishlab chiqarish tannarxi kamayadi, mahsulotning bozorga chiqish vaqti qisqaradi, bu esa raqobatbardoshlikni kuchaytiradi.



1-rasm. Ta’minot zanjiri bosqichlari

Agrologistika tizimining iqtisodiy ahamiyatini yana bir muhim jihati – ta’minot zanjirining integratsiyasi bilan bog‘liq. Bu tizim ishlab chiqaruvchi, qayta ishlovchi, eksportyor va iste’molchi o‘rtasida muvozanatli aloqani ta’minlaydi. Masalan, logistika markazlarida mahsulotni saqlash, saralash va qadoqlash imkoniyatlari mavjud bo‘lsa, fermerlar o‘z mahsulotini vaqtida realizatsiya qiladi, bu esa ularga iqtisodiy barqarorlik olib keladi.

Shuningdek, agrologistika qishloq hududlarining iqtisodiy infratuzilmasini rivojlantiradi. Transport yo‘llarining yaxshilanishi, sovutkich omborlari va qayta ishlash markazlarining qurilishi, axborot texnologiyalarining joriy etilishi nafaqat ishlab chiqarish samaradorligini, balki aholi bandligini ham oshiradi. Shu bois, agrologistika tizimi qishloq joylarining iqtisodiy tiklanishida, oziq-ovqat xavfsizligini ta’minlashda va eksport salohiyatini kengaytirishda strategik ahamiyatga ega yo‘nalish hisoblanadi.

II. Agrologistika tizimini rivojlantirishda innovatsion texnologiyalarning roli

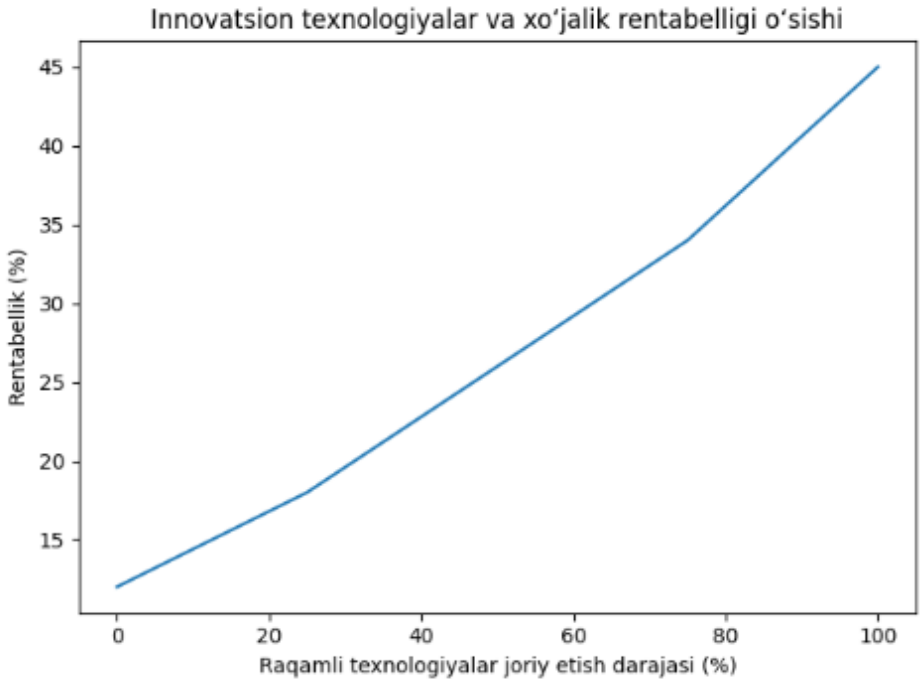
Zamonaviy iqtisodiyotda agrologistika tizimini samarali boshqarish uchun innovatsion texnologiyalar muhim o‘rin tutadi. Raqamli texnologiyalar, avtomatlashtirilgan tizimlar, sun’iy intellekt (AI), blokcheyn va dron texnologiyalari bu sohada inqilobiy o‘zgarishlar keltirib chiqarmoqda. Masalan, GPS asosidagi kuzatuv tizimlari yordamida mahsulotlarni yetkazib berish jarayoni onlayn monitoring qilinadi, bu esa transport xarajatlarini qisqartiradi va vaqtni tejaydi.

“Aqlli qishloq xo‘jaligi” (Smart Agriculture) konsepsiyasi doirasida sensorlar va IoT texnologiyalari yordamida dalalardagi tuproq namligi, o‘g‘it darajasi, hosil holati to‘g‘risidagi ma’lumotlar real vaqt rejimida yig‘iladi. Bu ma’lumotlar logistika tizimi bilan integratsiyalashganda, hosilni yig‘ib olish, saqlash va bozorga chiqarish bosqichlarida samarali rejalashtirish imkonini beradi. Natijada, yo‘qotishlar kamayadi, resurslardan foydalanish optimallashadi va ishlab chiqaruvchilarning iqtisodiy samaradorligi oshadi.

Blokcheyn texnologiyasi esa agrologistika tizimida mahsulot harakatini kuzatish, shaffoflikni ta’minlash va soxtalashtirish holatlarining oldini olishda muhim vosita bo‘lib xizmat qiladi. Bu esa eksport jarayonlarini soddalashtiradi va xalqaro bozorlarda ishonchni mustahkamlaydi.

Shuningdek, bulutli hisoblash texnologiyalari (Cloud computing) fermer xo‘jaliklariga real vaqt rejimida ma’lumot almashish imkonini beradi. Bu orqali logistika tarmog‘idagi barcha ishtirokchilar — ishlab chiqaruvchi, transport kompaniyasi va iste’molchi — o‘zaro bog‘lanadi va qarorlar tezkor qabul qilinadi.

Innovatsion texnologiyalarni keng joriy etish uchun malakali kadrlar tayyorlash, raqamli infratuzilmani rivojlantirish va axborot tizimlarini modernizatsiya qilish zarur. Shu yo‘l bilan agrologistika tizimi yanada barqaror, iqtisodiy jihatdan samarali va raqobatbardosh bo‘ladi.



2-rasm. Innovatsion texnologiyalar va xo‘jalik rentabelligi o‘sishi

III. Agrologistika tizimini rivojlantirishning iqtisodiy asoslari va davlat siyosatining roli

Agrologistika tizimining rivojlanishida iqtisodiy asoslar va davlat siyosatining o‘rni beqiyos. Chunki bu tizimning samarali faoliyat yuritishi uchun infratuzilma, moliyaviy manbalar, huquqiy bazalar va muvofiqlashtiruvchi siyosiy mexanizmlar zarur.

Birinchidan, investitsion muhitni yaxshilash va agrologistika loyihalariga mahalliy hamda xorijiy sarmoyadorlarni jalb etish muhim. Bu borada davlat tomonidan soliq imtiyozlari, subsidiyalar va imtiyozli kreditlar berilishi, xususiy sektorni rag‘batlantirish kerak. Ikkinchidan, davlat-xususiy sheriklik (PPP) modeli asosida agrologistika markazlari, sovuq zanjir tizimlari, omborlar va qayta ishlash korxonalarini barpo etish iqtisodiy jihatdan eng samarali yo‘l hisoblanadi.

Davlat siyosatining navbatdagi muhim yo‘nalishi — hududiy agrologistika markazlarini tashkil etishdir. Bunday markazlar mahsulotni yig‘ish, saralash, qadoqlash va eksportga tayyorlash bilan shug‘ullanadi. Natijada, fermerlar mahsulotni to‘g‘ridan-to‘g‘ri bozorga emas, balki logistika markazlariga topshiradi, bu esa ularning vaqtini, xarajatini va transport yukini kamaytiradi.

Shuningdek, davlat tomonidan raqamli platformalarni yaratish orqali barcha ishlab chiqaruvchilar, yetkazib beruvchilar va xaridorlar yagona tizimda faoliyat yuritishi mumkin bo‘ladi. Bu orqali mahsulot oqimi, narx dinamikasi va talab-taklif nisbati haqida real vaqt ma’lumotlari shakllanadi.

Qolaversa, agrologistika tizimini qo‘llab-quvvatlash orqali qishloq joylarda yangi ish o‘rinlari yaratiladi, eksport hajmi oshadi va oziq-ovqat xavfsizligi ta’minlanadi. Shu bois, davlat siyosati bu yo‘nalishda strategik yondashuv asosida amalga oshirilishi lozim.

Xulosa.

Agrologistika tizimi – bu zamonaviy qishloq xo‘jaligini raqamli transformatsiya qilishning asosi, iqtisodiy samaradorlikni oshiruvchi va resurslardan oqilona foydalanishni ta’minlovchi tizimdir. Tizimning samarali ishlashi ishlab chiqaruvchilar, qayta ishlovchilar, transport kompaniyalari va davlat organlari o‘rtasidagi hamkorlikka asoslanadi.

Agrologistika yordamida ishlab chiqarishdan iste’molchigacha bo‘lgan barcha jarayonlar integratsiyalashadi, bu esa vaqt, xarajat va resurslarni tejash imkonini beradi. Natijada mahsulot sifati yaxshilanadi, raqobatbardoshlik ortadi va eksport salohiyati kengayadi.

Kelgusida agrologistika tizimini takomillashtirish uchun raqamli texnologiyalarni joriy etish, infratuzilmani rivojlantirish, davlat-xususiy sheriklikni kengaytirish va ta’lim tizimida logistika yo‘nalishidagi mutaxassislarni tayyorlash zarur.

O‘zbekiston sharoitida bu tizimni rivojlantirish mamlakatning iqtisodiy mustaqilligini mustahkamlaydi, oziq-ovqat xavfsizligini ta’minlaydi hamda qishloq joylarda ijtimoiy barqarorlikni oshiradi. Shu bois, agrologistika — bu nafaqat logistika jarayonlarining yig‘indisi, balki qishloq xo‘jaligi iqtisodiyotining yangi bosqichga o‘tish vositasidir.

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РУССКО-УЗБЕКСКАЯ ЯЗЫКОВАЯ ИНТЕРФЕРЕНЦИЯ В РЕЧИ СТУДЕНТОВ, ИЗУЧАЮЩИХ РУССКИЙ ЯЗЫК: ФОНЕТИЧЕСКИЙ, ЛЕКСИЧЕСКИЙ И ГРАММАТИЧЕСКИЙ АСПЕКТЫ

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Аннотация. Статья посвящена проблеме русско-узбекской языковой интерференции в устной и письменной речи студентов, для которых узбекский язык является родным, а русский язык изучается как неродной. Цель исследования заключается в систематизации основных проявлений интерференции на фонетическом, лексическом и грамматическом уровнях и определении методических подходов к их предупреждению и коррекции. На основе сопоставительного анализа структурных особенностей русского и узбекского языков рассматриваются трудности усвоения русской системы ударения, произношения, лексической сочетаемости, грамматического рода, падежных форм и глагольных конструкций. Особое внимание уделяется механизмам переноса языковых моделей родного языка в речь на изучаемом языке. Предлагается комплексная модель работы с интерферентными ошибками, включающая контрастивный анализ, контекстуальные упражнения, редактирование письменных текстов и коммуникативную практику. Практическая значимость работы заключается в возможности использования предложенных рекомендаций при обучении русскому языку студентов вузов Узбекистана.

Ключевые слова: языковая интерференция, русско-узбекское двуязычие, узбекоязычные студенты, русский язык как неродной, фонетические ошибки, грамматическая интерференция, лексическая сочетаемость, сопоставительная лингвистика, речевая компетенция.

Аннотация. Maqolada ona tili o‘zbek tili bo‘lgan va rus tilini o‘zga til sifatida o‘rganayotgan talabalarning og‘zaki hamda yozma nutqida namoyon bo‘ladigan ruscha-o‘zbekcha til interferensiyasi muammosi yoritiladi. Tadqiqotning maqsadi fonetik, leksik va grammatik darajalarda kuzatiladigan interferensiya holatlarini tizimlashtirish hamda ularning oldini olish va tuzatishga qaratilgan metodik yondashuvlarni aniqlashdan iborat. Rus va o‘zbek tillarining strukturaviy xususiyatlarini qiyosiy tahlil qilish asosida rus tilidagi urg‘u va talaffuz, leksik birikuvchanlik, grammatik rod, kelishik shakllari va fe’l konstruksiyalarini o‘zlashtirishdagi qiyinchiliklar ko‘rib chiqiladi. Ona tiliga xos til modellari o‘rganilayotgan tildagi nutqqa ko‘chish mexanizmlariga alohida e’tibor beriladi. Interferensiya xatolarining oldini olish uchun qiyosiy tahlil, kontekstual mashqlar, yozma matnlarni tahrirlash va kommunikativ amaliyotni birlashtiruvchi metodik model taklif etiladi. Tadqiqot natijalaridan O‘zbekiston oliy ta’lim muassasalarida rus tilini o‘qitish jarayonida foydalanish mumkin.

Kalit so‘zlar: til interferensiyasi, ruscha-o‘zbekcha ikki tillilik, o‘zbek tilida so‘zlashuvchi talabalar, rus tilini o‘zga til sifatida o‘rganish, fonetik xatolar, grammatik interferensiya, leksik birikuvchanlik, qiyosiy lingvistika, nutqiy kompetensiya.

Abstract. The article examines Russian-Uzbek language interference in the oral and written speech of university students whose native language is Uzbek and who study Russian as a non-native language. The aim is to systematize the main manifestations of interference at the phonetic, lexical and grammatical levels and to identify methodological approaches to its prevention and correction. A contrastive analysis of Russian and Uzbek linguistic structures is used to discuss difficulties related to Russian stress and pronunciation, lexical collocations, grammatical gender, case forms and verb constructions. Particular attention is paid to the transfer of native-language patterns into target-language production. The article proposes an integrated approach to addressing interference errors through contrastive analysis, contextual exercises, written-text editing and communicative practice. The findings and recommendations may be used in Russian-language instruction at higher education institutions in Uzbekistan.

Keywords: language interference, Russian-Uzbek bilingualism, Uzbek-speaking students, Russian as a non-native language, phonetic errors, grammatical interference, lexical collocations, contrastive linguistics, communicative competence.

Введение. В условиях расширения международного сотрудничества, академической мобильности и профессиональной коммуникации владение русским языком сохраняет практическую значимость для студентов высших образовательных учреждений Узбекистана. Русский язык используется в образовательной, научной, экономической и культурной сферах, что обусловливает необходимость формирования у студентов устойчивых навыков устной и письменной коммуникации.

Одной из проблем, возникающих при изучении русского языка узбекоязычными студентами, является языковая интерференция. Под интерференцией понимается влияние языковых структур и речевых привычек одного языка на использование другого языка. В условиях двуязычия, это влияние может проявляться в произношении, выборе лексических единиц, построении грамматических форм и организации высказывания.

Проблема интерференции имеет особое значение в образовательной среде, поскольку студенты нередко используют модели родного языка при построении русскоязычных высказываний. В результате могут возникать ошибки, связанные с различиями в фонетической, морфологической и синтаксической системах двух языков. Исследования русско-узбекского языкового взаимодействия также обращают внимание на несовпадение падежных функций, морфологических категорий и моделей построения речи [1].

Актуальность темы определяется необходимостью не только выявлять речевые ошибки, но и объяснять причины их возникновения. Такой подход позволяет перейти от механического исправления неправильных форм к осознанному усвоению норм русского языка.

Цель статьи - определить основные проявления русско-узбекской языковой интерференции в речи студентов и разработать методические рекомендации по её предупреждению и коррекции.

Для достижения поставленной цели необходимо решить следующие задачи:

Рассмотреть понятие языковой интерференции и её основные виды.

Выявить потенциальные зоны интерференции при сопоставлении русского и узбекского языков.

Систематизировать типичные модели фонетических, лексических и грамматических затруднений.

Предложить методические приёмы развития нормативной русской речи узбекоязычных студентов.

Объект исследования - устная и письменная речь узбекоязычных студентов, изучающих русский язык.

Предмет исследования - фонетические, лексические и грамматические проявления межъязыковой интерференции, обусловленные различиями между русским и узбекским языками.

В работе применяются описательный, сопоставительный и контекстуально-семантический методы. Примеры, представленные далее, иллюстрируют потенциальные зоны интерференции и служат материалом для методического анализа. Для установления их частотности и подтверждения эмпирических закономерностей необходим отдельный анализ реальных студенческих высказываний.

1. Теоретические основы изучения языковой интерференции.

Понятие интерференции занимает важное место в исследованиях двуязычия и контактной лингвистики. Одним из основоположников систематического изучения данного явления является У. Вайнрайх, который исследовал языковые контакты и изменения, возникающие в результате взаимодействия языковых систем [2].

Интерференция может рассматриваться как результат переноса привычных языковых моделей в процесс восприятия и порождения речи на другом языке. Такой перенос не всегда приводит к ошибкам: в отдельных случаях сходство языковых структур облегчает усвоение нового материала. Однако при несовпадении грамматических категорий, значений слов или правил употребления языковых единиц возникает риск отклонения от норм изучаемого языка.

В методике преподавания русского языка как неродного целесообразно разграничивать несколько видов интерференции:

фонетическая - влияние произносительных привычек родного языка на произношение звуков, ударение и интонацию;

лексическая - перенос значений слов и моделей их сочетаемости;

грамматическая - использование морфологических форм и синтаксических конструкций по аналогии с родным языком;

синтаксическая - перенос привычных моделей построения предложения и расположения его компонентов;

прагматическая - различия в выборе речевых формул в зависимости от ситуации общения.

Указанные виды взаимосвязаны. Например, неправильное употребление падежной формы может сопровождаться нарушением лексической сочетаемости, а фонетические трудности могут снижать понятность устного высказывания.

При анализе интерференции необходимо учитывать, что не каждое отклонение от языковой нормы объясняется влиянием родного языка. Ошибки могут быть связаны также с недостаточным знанием правила, чрезмерным обобщением изученной модели, ограниченным словарным запасом или недостаточной речевой практикой. Поэтому установление интерферентной природы ошибки требует сопоставления языковых фактов и анализа контекста.

2. Фонетическая интерференция в русской речи узбекоязычных студентов

Фонетический уровень является одним из важных компонентов формирования речевой компетенции. Произносительные трудности могут проявляться в артикуляции отдельных звуков, воспроизведении сочетаний согласных, постановке ударения и интонационном оформлении предложения.

Русский и узбекский языки различаются составом фонологических средств и особенностями их функционирования [3]. В русском языке словесное ударение является свободным и может менять место в формах одного слова. Кроме того, безударные гласные подвергаются редукции, а противопоставление согласных по твёрдости и мягкости играет значимую роль в различении слов и грамматических форм.

Для узбекоязычных студентов потенциальную трудность могут представлять следующие явления:

Усвоение места русского словесного ударения.

Различение твёрдых и мягких согласных.

Произношение сложных сочетаний согласных.

Воспроизведение безударных гласных в соответствии с нормами русского произношения.

Использование интонации при выражении вопроса, сообщения и эмоциональной оценки.

Например, слова «за́мок» и «замо́к» различаются значением в зависимости от места ударения. При изучении таких слов необходимо обращать внимание не только на звуковую форму, но и на смыслоразличительную функцию ударения.

Работа над фонетической интерференцией должна включать аудирование образцовой речи, повторение слов и фраз, чтение вслух, упражнения на минимальные пары и запись собственного произношения с последующим анализом.

Особое значение имеет включение фонетических заданий в профессиональные коммуникативные ситуации. Например, студенты экономических направлений могут отрабатывать произношение терминов «договор», «бухгалтерия», «финансы», «платёж», «прибыль» и использовать их в кратких устных сообщениях.

3. Лексическая интерференция и особенности русско-узбекской лексической сочетаемости

Лексическая интерференция возникает в случаях, когда значение слова, его употребление или сочетаемость в русском языке осваиваются через прямой перенос соответствующей модели родного языка.

Даже при знании отдельных слов студент может испытывать затруднения при построении естественного русского высказывания. Это связано с тем, что владение лексикой предполагает не только знание значений слов, но и понимание их сочетаемости, стилистических ограничений и типичных контекстов употребления.

Например, при изучении русских глаголов и существительных важно усваивать нормативные сочетания:

«принимать решение»;

«оказывать помощь»;

«играть важную роль»;

«уделять внимание»;

«добиваться результата».

Буквальный перевод устойчивых выражений с узбекского языка может привести к выбору неестественной или ненормативной русской конструкции. Однако конкретный случай следует считать интерференцией только после анализа исходного узбекского выражения и контекста употребления [4].

Отдельную трудность представляет разграничение близких по значению слов. Например, глаголы «учить», «изучать» и «учиться» имеют различное управление и употребляются в разных синтаксических моделях:

студент изучает русский язык;

преподаватель учит студентов;

студент учится в университете.

При недостаточном усвоении этих различий возможно смешение моделей управления.

Для предупреждения лексической интерференции рекомендуется использовать тематические словари, контекстуальные задания, подбор словосочетаний, упражнения на редактирование предложений и перевод с обязательным объяснением выбора языковых средств.

Особенно эффективным может быть сопоставление не отдельных слов, а целых словосочетаний и речевых формул. Такой подход позволяет студентам усваивать лексику в естественных контекстах и развивать способность самостоятельно строить нормативные высказывания.

4. Грамматическая интерференция: основные зоны затруднений

Грамматическая интерференция связана с различиями в устройстве русского и узбекского языков. В русском языке существуют категории грамматического рода, падежа, числа, вида и времени глагола, а также развитая система согласования слов. В узбекском языке грамматические значения выражаются другими средствами и организуются по иным моделям.

4.1. Категория грамматического рода

В русском языке существительные распределяются по трём грамматическим родам: мужскому, женскому и среднему. Род влияет на согласование существительных с прилагательными, местоимениями и формами прошедшего времени глагола.

В узбекском языке грамматическая категория рода отсутствует. Поэтому при изучении русского языка студентам необходимо запоминать род существительного и одновременно усваивать соответствующие модели согласования.

Нормативные примеры:

новый учебник;

новая книга;

новое задание;

интересная лекция;

интересный предмет.

Методически целесообразно изучать существительное вместе с согласуемыми словами, а не изолированно. Например: «университет - новый университет», «книга - интересная книга», «задание - сложное задание».

4.2. Употребление падежных форм

Падежная система русского языка представляет собой одну из потенциально сложных областей для студентов, говорящих на узбекском языке. Хотя в обоих языках существуют средства выражения отношений между участниками ситуации, их функции и правила употребления не совпадают полностью [5].

Затруднения могут возникать при выборе падежа после глаголов и предлогов, а также при выражении пространственных, временных и объектных отношений.

Сравним нормативные конструкции:

интересоваться историей;

помогать другу;

гордиться университетом;

работать в университете;

идти в университет.

Выбор падежа зависит от значения конструкции, управления глагола и наличия предлога. Поэтому механическое запоминание окончаний без понимания смысловых отношений не обеспечивает устойчивого владения падежной системой.

В качестве методического приёма рекомендуется использовать модели управления, в которых глагол изучается вместе с зависимым существительным: «интересоваться чем?», «помогать кому?», «гордиться чем?», «находиться где?», «направляться куда?».

4.3. Глагольные формы и способы выражения действия

Различия в глагольных системах русского и узбекского языков могут создавать трудности при выражении времени, завершённости действия, повторяемости и последовательности событий.

Особое внимание необходимо уделять видовому противопоставлению русских глаголов: «читать - прочитать», «решать - решить», «выполнять - выполнить».

Например:

Каждый день студент читает научную статью.

Вчера студент прочитал научную статью.

В первом предложении действие представлено как процесс или регулярное действие, во втором - как завершённое действие в конкретной ситуации.

Для формирования устойчивого навыка рекомендуется анализировать глагольные формы в контексте, сравнивать ситуации употребления и составлять собственные предложения с видовыми парами.

4.4. Порядок слов в предложении

Русский язык допускает относительную свободу порядка слов, поскольку синтаксические отношения во многом выражаются падежными окончаниями и согласованием. В узбекском языке порядок слов обычно более устойчив, и сказуемое часто располагается в конце предложения [6].

При переносе привычной модели построения высказывания в русскую речь могут возникать предложения, требующие стилистической или синтаксической корректировки.

Например, нейтральная русская конструкция: «Студенты изучают русский язык в университете». При обучении важно не только исправлять порядок слов, но и объяснять, как он связан с актуальным членением предложения, логическим ударением и коммуникативной задачей.

Таким образом, грамматическую интерференцию целесообразно изучать как результат взаимодействия нескольких факторов: структурных различий языков, степени сформированности языковых навыков и особенностей речевой ситуации.

5. Методические способы предупреждения и коррекции интерференции

Преодоление интерференции требует системной работы, объединяющей объяснение языковых закономерностей, тренировку отдельных навыков и развитие самостоятельной речи.

Первый этап - выявление трудностей. Преподавателю рекомендуется анализировать устные ответы, письменные работы, переводы, диалоги и результаты диагностических заданий. Ошибки следует распределять по уровням: фонетическому, лексическому, грамматическому и синтаксическому.

Второй этап - сопоставительное объяснение. При изучении сложной конструкции необходимо показать, как соответствующее значение выражается в русском и узбекском языках, какие элементы совпадают и какие требуют особого внимания.

Третий этап - тренировка в контексте. Отдельные грамматические формы и слова следует закреплять в предложениях, диалогах, профессиональных ситуациях и небольших текстах.

Четвёртый этап - самостоятельное редактирование. Студент должен не только исправлять ошибку после замечания преподавателя, но и научиться объяснять причину выбора нормативной формы.

Пятый этап - перенос навыка в свободную коммуникацию. Освоенные конструкции необходимо использовать в устных выступлениях, дискуссиях, деловых диалогах и письменных сообщениях.

Для практической реализации предлагается следующая система работы.

Тип интерференции	Приём работы	Пример задания
Фонетическая	Аудирование и повторение	Поставить ударение в словах «договор», «звонит», «каталог» и проверить произношение по нормативному словарю
Лексическая	Контекстуальный подбор	Составить предложения со словосочетаниями «принимать решение», «оказывать помощь»
Грамматическая	Модели согласования	Согласовать прилагательные с существительными: «новый университет», «новая аудитория»
Падежная	Модели управления	Продолжить: «интересоваться…», «помогать…», «гордиться…»
Синтаксическая	Редактирование текста	Перестроить предложения с учётом нормы русского языка и коммуникативного намерения

Для закрепления материала целесообразно использовать комплексные задания. Например, студентам предлагается небольшой текст о жизни университета. Сначала они выделяют существительные и определяют их род, затем анализируют падежные формы, отмечают устойчивые словосочетания и читают текст вслух, соблюдая нормы ударения и интонации.

Важным условием является индивидуализация обучения. Ошибки разных студентов могут иметь различные причины, поэтому одинаковый набор упражнений не всегда обеспечивает одинаковый результат. Диагностические задания позволяют определить, какие языковые явления требуют дополнительной тренировки [7].

Предложенная система может использоваться как основа для разработки экспериментальной методики. Для проверки её эффективности необходимо провести входное и итоговое тестирование, зафиксировать количество и типы ошибок, а затем сопоставить результаты до и после обучения.

6. Перспективы дальнейшего исследования

Перспективным направлением дальнейшей работы является создание корпуса устной и письменной речи узбекоязычных студентов, изучающих русский язык в высшей школе. Такой корпус позволил бы выявлять повторяющиеся типы ошибок, анализировать их зависимость от уровня владения языком и оценивать эффективность различных способов коррекции.

Эмпирическое исследование целесообразно организовать по следующим этапам:

Определить выборку участников и уровень владения русским языком.

Собрать письменные работы и записи устных ответов с соблюдением требований этики исследования.

Разработать классификатор ошибок и правила их кодирования.

Провести независимую проверку части материала для повышения надёжности классификации.

Сопоставить распределение ошибок по языковым уровням.

Разработать систему упражнений и проверить её результативность в педагогическом эксперименте.

В перспективе результаты могут быть использованы при подготовке учебных пособий по русскому языку для узбекоязычных студентов, создании электронных тренажёров и разработке материалов для самостоятельной работы.

При этом важно различать теоретически предполагаемые зоны интерференции и ошибки, реально зафиксированные в студенческой речи. Частотность каждого явления должна устанавливаться на основании фактического материала, а эффективность методических рекомендаций - подтверждаться результатами апробации.

Заключение. Русско-узбекская языковая интерференция представляет собой многокомпонентное явление, которое может проявляться на фонетическом, лексическом и грамматическом уровнях речи студентов. Её возникновение связано не только с различиями между языковыми системами, но и с особенностями формирования навыков восприятия и порождения речи на изучаемом языке.

На фонетическом уровне потенциальные трудности связаны с усвоением русского ударения, произношения и интонации. На лексическом уровне особого внимания требуют сочетаемость слов, управление и выбор языковых единиц в зависимости от контекста. На грамматическом уровне значимыми зонами обучения являются категория рода, падежные формы, глагольные конструкции и порядок слов.

Проведённый теоретико-аналитический обзор позволяет обосновать целесообразность комплексного подхода к работе с интерференцией. Он предполагает сочетание сопоставительного анализа русского и узбекского языков, контекстуальных упражнений, диагностики ошибок, самостоятельного редактирования и коммуникативной практики.

Практическая реализация предложенных рекомендаций может способствовать совершенствованию методики преподавания русского языка в узбекоязычной аудитории. Вместе с тем установление частотности отдельных типов интерференции и оценка результативности предложенной системы требуют отдельного эмпирического исследования. Это определяет перспективу дальнейшей работы, направленной на создание проверенной методики предупреждения и коррекции интерферентных ошибок в речи студентов.

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SCIENTIFIC-THEORETICAL AND PEDAGOGICAL FOUNDATIONS OF TEACHING ENGLISH IN SCHOOLS WITH TEACHING IN RELATED LANGUAGES

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Abstract. The thesis analyzes the linguistic, psycholinguistic, and pedagogical foundations of teaching English in schools in the Republic of Karakalpakstan where instruction is conducted in the Karakalpak, Uzbek, Kazakh, and Turkmen languages. English is regarded as the third language of students, which is mastered based on native and state languages. Principles and didactic conditions have been identified, the consideration of which allows for transforming the kinship of Turkic languages from a source of homogeneous errors into a learning resource.

Keywords: related languages, multilingualism, third language, comparative analysis, teaching principles.

Introduction. According to the Law of the Republic of Uzbekistan "On Education," instruction in general education schools may be conducted in various languages, and the study of foreign languages is a mandatory part of the educational content [5]. In the Republic of Karakalpakstan, this norm is being implemented particularly clearly: schools with Karakalpak, Uzbek, Kazakh, and Turkmen languages of instruction operate in one region. For most students in such schools, English is already the third language: it is preceded by the mother tongue and the state (or second) language. Consequently, the methodology of teaching English in these schools should be based not on the "mother tongue – foreign language" model, but on a multilingual education model that takes into account the child's entire linguistic experience.

Linguistic foundations. The starting point is the comparative analysis of languages, according to which the difficulties of mastering a foreign language are largely predictable from the differences between it and the student's native language (Lado, 1957). The Karakalpak, Kazakh, Uzbek, and Turkmen languages belong to the Turkic family and are similar in grammatical structure: they are characterized by agglutination, synharmonism, preposition of the attribute, the verb at the end of the sentence, postpositions instead of prepositions, and the absence of articles and grammatical gender. English, on the other hand, is analytic: grammatical meanings are conveyed through word order, auxiliary words, and auxiliary verbs. From this, an important conclusion follows: students in all four types of schools face the same "risk zones" (articles, prepositions, fixed word order, form-time system, to-be conjunction), so a common error prevention system can be created for them with brief explanations in each of their native languages.

Psycholinguistic foundations. According to the hypothesis of linguistic interdependence, skills formed in one language form a common base that is transferred to other languages (Cummins, 1979). Studies of third-language acquisition show that bilingual students have more developed metalinguistic awareness and use both previously acquired languages when learning a new language (Cenoz, 2013). At the same time, a student perceives a new language primarily through similarities with previously known languages: it is precisely the observed similarity that facilitates understanding and memorization (Ringbom, 2007). For students of Turkic-speaking schools, such a "bridge" can be the international vocabulary familiar through the Russian language, common word-formation patterns, and the ability to compare grammatical phenomena developed during the study of a second language.

Pedagogical foundations. Based on the provisions set forth, the following principles of teaching English in schools with related languages of instruction can be identified: the principle of relying on the mother tongue (the rational use of the mother tongue to explain difficult phenomena and semantize vocabulary); the comparative principle (conscious comparison of the structures of English and the mother tongue); the principle of communicative orientation (subordinating linguistic material to the solution of speech tasks);

the principle of considering multilingual experience (using students' knowledge of the second language); the principle of intercultural orientation (comparing the realities of native and English-speaking cultures).

Implementing these principles requires creating a number of didactic conditions: developing educational materials with comparative commentary in the students' native languages; training English teachers who possess the basics of contrastive grammar in Turkic languages; differentiating assignments according to the A1–A2 levels of the Common European Framework of Reference (CEFR); and incorporating interactive forms of work into the lesson that develop not only the linguistic but also the communicative and intercultural competence of students.

Conclusion. The scientific and theoretical basis for teaching English in schools with related languages is made up of comparative linguistics, the theory of linguistic interdependence, and research on multilingualism. The typological proximity of the Karakalpak, Kazakh, Uzbek, and Turkmen languages allows for the development of a unified methodological system for all four types of schools, supplemented with brief supports in each mother tongue. The leading pedagogical principles of such a system are relying on the mother tongue, comparison, communicative orientation, and consideration of students' multilingual experience.

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СОЦИАЛЬНО-ПСИХОЛОГИЧЕСКАЯ ХАРАКТЕРИСТИКА ЖЕНСКОГО ОБРАЗА В РАССКАЗЕ В. Я. ШИШКОВА «КРАЛЯ»

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Аннотация. В тезисах анализируется социально-психологический образ Евдокии (Дуни) в рассказе В. Я. Шишкова «Краля» (1913). Рассматриваются семантика заглавия, речевая характеристика, социальная зависимость героини, позиция доктора Шера и композиционная роль финала. На основе текстуального и структурно-поэтического анализа показано, что внешняя оценка привлекательности женщины постепенно уступает место раскрытию её жизненного опыта. Делается вывод о взаимосвязи психологизма и нравственного конфликта, возникающего из несовпадения точек зрения персонажей.

Ключевые слова: В. Я. Шишков; «Краля»; женский образ; психологизм; социальный конфликт; речевая характеристика; композиция; точка зрения.

SOCIO-PSYCHOLOGICAL CHARACTERIZATION OF THE FEMALE PROTAGONIST IN V. YA. SHISHKOV'S "KRALYA"

Abstract. The paper examines the socio-psychological portrayal of Evdokia (Dunya) in V. Ya. Shishkov's short story "Kralya" (1913). It focuses on the meaning of the title, the heroine's speech, her dependence on social circumstances, Doctor Sher's perspective, and the function of the ending. Close reading and structural-poetic analysis reveal how an initial emphasis on physical attractiveness gradually gives way to a more complex understanding of the protagonist's experience. Special attention is paid to the contrast between Dunya's attempts to preserve personal dignity and the coercion exercised by male figures. The story's delayed disclosure of decisive circumstances prompts readers to reconsider earlier judgments. It is argued that the female character's psychological depth emerges from the interplay of dialogue, competing viewpoints, and the moral conflict between sympathy and a genuine willingness to understand another person.

Keywords: Vyacheslav Shishkov; Kralya; female character; literary psychologism; social conflict; speech characterization; narrative perspective; composition.

Проблема женского образа в русской прозе начала XX века связана не только с изображением индивидуального характера, но и с художественным осмыслением общественных отношений, ограничивающих возможность самостоятельного выбора. В рассказе В. Я. Шишкова «Краля» (1913) судьба крестьянки Евдокии (Дуни) раскрывается через столкновение личного чувства, социального неравенства и насилия. Сначала героиня предстаёт в восприятии окружающих прежде всего привлекательной женщиной, однако развитие сюжета выявляет скрытые обстоятельства её жизни [1, с. 33–52]. Цель исследования — определить, как посредством именования, диалога, жеста и повествовательной перспективы создаётся социально-психологическая сложность образа. Методологически значимо разграничение внешней и внутренней точек зрения, разработанное Б. А. Успенским [2, с. 111–112]. Выводы относятся к рассказу «Краля», а не ко всему творчеству писателя.

Заглавие произведения обладает не только назывной, но и оценочной функцией. В бытовом употреблении слово «краля» связано с представлением о женской красоте, но у Шишкова оно прежде всего воспроизводит чужой взгляд на героиню. В начале рассказа персонажи обсуждают её внешность ещё до того, как читателю становится известна её личная история [1, с. 33–52]. Тем самым заглавная номинация становится условием дальнейшего переосмысления образа.

Показательно движение от характеристики «краля» к индивидуализирующим именованиям «Евдокия Ивановна» и «Дуня». Прозвище обращает внимание на впечатление окружающих, тогда как личное имя сопровождает раскрытие переживаний и жизненного опыта женщины. В

исследовании композиции Б. А. Успенский подчёркивает, что разные наименования одного лица могут выражать несовпадающие позиции наблюдателей [2, с. 38–39]. Применительно к рассказу Шишкова этот подход позволяет увидеть в выборе имени средство характеристики отношений между персонажами.

Важнейшее средство изображения внутреннего мира Дуни — её собственная речь. Когда доктор Шер восторженно говорит о красоте героини, она отвечает с заметным недоверием к ценности такого восхищения. Для доктора красота служит основанием романтического увлечения; для женщины важнее повседневная безопасность и возможность изменить неблагополучную жизнь. Этот контраст показывает: прямая речь несёт психологическую информацию без обязательного развёрнутого авторского комментария [1, с. 33–52].

В другой сцене Дуня резко возражает доктору, когда тот пытается расспрашивать её о личных отношениях так, словно обладает правом контроля. Реплика обнаруживает потребность героини защитить границы собственной жизни, но вслед за протестом в её поведении проявляются осторожность и стремление не потерять возможную поддержку [1, с. 33–52]. В результате психологизм возникает из столкновения интонаций, речевых жестов и ситуативных реакций. Теоретически здесь важно различать то, что доступно внешнему наблюдателю, и то, что известно о внутреннем состоянии действующего лица [2, с. 111–112].

Социальная зависимость и мотив принуждения

Социальный статус героини обозначен словом «солдатка». Отсутствие мужа, находящегося на службе, не означает её независимости. Лишь в позднем признании Дуня сообщает о жестоком обращении в семье, а в настоящем времени оказывается в опасной зависимости от урядника. Соответственно, поступки, которые со стороны выглядят непоследовательными или легкомысленными, можно рассматривать в контексте страха и вынужденной осторожности [1, с. 33–52]. Такой анализ не оправдывает любую интерпретацию героини, но требует учитывать обстоятельства, прямо обозначенные в произведении.

Урядник воплощает давление, выходящее за пределы частных отношений: его поведение подкреплено властным статусом и угрозами. Неравенство социальных возможностей превращает внешнюю привлекательность Дуни в источник уязвимости, а не гарантированного благополучия. Вместе с тем текст не объясняет исчерпывающе все её решения. Отсюда необходимость разграничивать прямо сообщаемые сведения, впечатления других персонажей и исследовательские предположения. Именно неполнота доступного знания становится существенным художественным условием конфликта [1, с. 33–52].

Позиция доктора Шера и композиционная роль ошибки

Доктор Шер первоначально идеализирует Дуню: восхищение внешностью он переносит на представление о её нравственной безупречности. Его оценка принадлежит персонажу и не должна автоматически приниматься за авторскую позицию. Увидев сцену с участием урядника, доктор трактует её в соответствии со своей ревностью, не располагая полными сведениями. Позднейшее объяснение женщины заставляет читателя поставить под сомнение этот поспешный приговор [1, с. 33–52].

Значимую роль играет пространственная деталь: доктор видит происходящее из ограниченного места наблюдения, а затем переносит неполную зрительную картину на оценку мотивов Дуни. Ограниченность поля зрения соотносится с недостаточностью нравственного понимания. Б. А. Успенский показывает, что при психологическом описании один и тот же эпизод может быть

представлен как субъективное восприятие персонажа или как изложение более полных обстоятельств [2, с. 110–112]. В «Крале» расхождение между увиденным доктором и рассказанным героиней организует важнейший смысловой поворот.

Композиция рассказа строится на последовательном раскрытии необходимой информации. Сначала преобладают чужие оценки внешности Дуни, затем идут сцены сближения с доктором, после чего всё настойчивее возникают признаки тревоги и угрозы. Подробности семейного насилия и принуждения со стороны урядника становятся известны читателю ближе к развязке [1, с. 33–52]. Такой порядок сцен требует переоценить предшествующее поведение героини: то, что прежде воспринималось как игра, после признания приобретает иной психологический смысл.

В финале Дуня пытается объяснить доктору своё положение и обрести поддержку, однако открытое признание не обеспечивает ей освобождения [1, с. 33–52]. Драматизм эпизода заключается не только в крушении романтического ожидания. Доктор оказывается неготовым отказаться от созданного им образа и принять чужой трудный опыт. Так социальная тема соединяется с нравственным вопросом: можно ли считать сочувствие подлинным, если оно исчезает при столкновении с обстоятельствами жизни другого человека?

Природные образы усиливают композиционную завершённость рассказа. Осенняя дорога, движение перелётных птиц, первый снег и мотив весеннего возвращения создают рамку, в которой естественному круговороту противопоставлена неопределённость человеческой судьбы [1, с. 33–52]. Внутренняя мечта доктора о будущем не равнозначна реальному спасению Дуни. Таким образом, пейзаж не просто сопровождает действия, а усиливает разрыв между возможностью обновления и отсутствием перемен в судьбе героини.

Таким образом, социально-психологическая характеристика Дуни возникает из взаимодействия оценочной номинации, речевого психологизма, ограниченной перспективы доктора и позднего раскрытия обстоятельств насилия. Героиня не сводится ни к образу легкомысленной красавицы, ни к схеме пассивной жертвы: стремление к личному достоинству в ней сочетается с вынужденной осторожностью. Рассказ ставит вопрос об ответственности человека за суждение о чужой жизни и демонстрирует нравственную недостаточность внешнего сочувствия. Полученные результаты применимы при изучении ранней прозы В. Я. Шишкова; проблема жанрово-стилевой организации его произведений рассматривается также в современных литературоведческих исследованиях [3, с. 206–213].

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TERMS AND PROFESSIONALISMS: FORMATION, FUNCTIONAL FEATURES, AND CONTEMPORARY ISSUES IN TERMINOLOGY MANAGEMENT

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Abstract. This article examines the theoretical foundations of the concepts of terms and professionalisms, their relationship, their functional characteristics in professional communication, and the processes through which they develop. It also discusses the classification of specialized vocabulary, terminology standardization, the development of multilingual terminological resources, and the management of terminological data through digital technologies. By identifying the distinctive features of terms and professionalisms, the article considers ways to promote accuracy, consistency, and comprehensibility in scientific and technical communication. The role of interdisciplinary interaction, translation, professional education, and artificial intelligence in the development of terminological systems is also addressed.

Keywords. term; terminology; professionalism; professional vocabulary; specialized language; terminology standardization; terminology management; multilingual communication; translation.

The rapid development of contemporary science and technology has led to the emergence of specialized lexical units that express concepts belonging to different fields. In science, engineering, medicine, information technology, economics, and manufacturing, the accurate use of specialized vocabulary is important for exchanging scientific information, improving professional performance, and transmitting knowledge consistently. From this perspective, the study of terms and professionalisms is a significant area of contemporary linguistics, terminology studies, translation studies, and professional communication.

Terminology is concerned with naming and defining concepts in a particular field of knowledge, organizing them systematically, and identifying the relationships between them [1, 2]. The international standard ISO 704:2022 sets out principles for terminology work, including the relationships between concepts and designations and approaches to term formation and definition writing [1]. This approach suggests that terminology should be understood not merely as a collection of specialized words, but as a scientific and practical activity based on a system of concepts.

Alongside terms, professionalisms constitute an important layer of specialized vocabulary. They are used within particular occupations and professional communities, especially in everyday workplace communication, production processes, and the exchange of practical experience. However, the boundary between terms and professionalisms is not always clear-cut. Some expressions initially used informally within a professional group may become more widely used or enter an official terminological system over time.

The aim of this article is to explain the theoretical nature of terms and professionalisms, identify their similarities and differences, outline contemporary principles of terminology management, and demonstrate the importance of specialized vocabulary in multilingual and digital communication.

The article uses descriptive, comparative-analytical, and classification methods. Its discussion is based on terminology literature and principles presented in international standards.

Theoretical foundations of terms and terminology. Terminology studies the units used to name concepts in specialized fields of knowledge and the semantic relationships between those concepts. A term can be described as a designation for a concept within a particular subject field. Unlike many words in general vocabulary, its meaning is interpreted in relation to a specific scientific, technical, or professional context.

M. T. Cabré presents terminology as an interdisciplinary field closely connected with linguistics, cognition, communication, and documentation. Her approach emphasizes that terminological units should be studied not only in terms of their linguistic form, but also in relation to the concepts they represent and the communicative functions they perform [2].

One of the principal characteristics of terms is their capacity to express a specialized concept with a high degree of precision. Their meaning, field of application, and relationship to other concepts are therefore important [1, 5]. Examples include *myocardial infarction* in medicine, *interface* in information technology, and *photovoltaic system* in energy engineering. The meaning of each unit is clarified by the theoretical and practical knowledge of its relevant field.

The consistency of a terminological system depends on the accurate definition of concepts and the identification of relationships among them. If one concept is expressed by several names, synonymous variants may need to be recorded. Conversely, if the same form has different meanings in different fields, its subject area and context should be specified. For this reason, terminological resources should ideally record not only the term itself, but also its definition, subject field, source, synonyms, and usage characteristics.

J. C. Sager links terminology work with the collection, organization, standardization, storage, and use of specialized vocabulary [3]. This perspective shows that terminology work extends beyond theoretical linguistic questions to practical information management and translation.

The nature and distinctive features of professionalisms. Professionalisms are specialized lexical units used in the activities and communication of particular occupational groups. They often emerge through practical experience, informal interaction, and the conventions of a professional environment [5, 6]. Such expressions can help practitioners communicate quickly and concisely, coordinate work, and share professional knowledge. The differences can be summarized as follows:

Functional and communicative features of terms and professionalisms. Specialized vocabulary primarily serves to transmit information accurately and efficiently in professional communication. Terms name concepts, organize scientific information, describe technical processes, and help establish a shared conceptual framework among specialists. Professionalisms, in turn, may promote brevity, speed, and mutual understanding in everyday workplace interaction.

One important function of specialized vocabulary is communicative precision. When concepts in a field are expressed through consistent terminology, information exchange among specialists becomes more reliable [1, 2, 6]. By contrast, using different names for the same concept without explanation, or using one term to refer to different concepts, may lead to misunderstanding.

A second function is the transmission and preservation of knowledge. Terminological dictionaries, databases, technical documents, and educational materials preserve specialized knowledge in an organized form. These resources support professional training, scientific research, and the transfer of practical experience to new generations.

A third function relates to translation and interdisciplinary collaboration. Specialists working in different languages need coordinated terms to express the same concepts. In this process, identifying a dictionary equivalent is not sufficient: the meaning of the concept, its field of use, and its functional characteristics must also be taken into account.

At the same time, excessive use of professionalisms may create barriers to communication. This is particularly relevant in international collaboration, public communication, and texts intended for broad

audiences, where specialized expressions may need to be explained. Effective professional communication therefore requires a balance between terminological precision and accessibility.

Terminology standardization and management. Terminology standardization is the process of establishing consistent designations for concepts in a particular field and promoting uniform use of preferred terms [1, 6]. It is especially important in engineering, medicine, technology, and other areas where precision is essential.

ISO 704:2022 describes general principles for terminology work, including relationships among objects, concepts, definitions, and designations, as well as approaches to term formation and definition writing [1]. These principles provide a methodological basis for developing terminological dictionaries, standards, and specialized databases.

Terminology management includes more than collecting and classifying terms. It also involves checking, approving, updating, and monitoring their use in practice. This process can be organized into the following stages:

1. Term identification and collection. Relevant units are extracted from specialized texts, standards, research articles, and professional documents. 2. Concept clarification. The meaning of each term, its field of application, and its relationships with other concepts are established. 3. Terminological analysis. Synonyms, variants, abbreviations, and possible cases of polysemy are examined. 4. Standardization and approval. Recommended forms are identified with the participation of relevant specialists. 5. Documentation and dissemination. Terms are recorded in dictionaries, databases, standards, and electronic resources. 6. Monitoring and updating. New concepts, technologies, and changes in usage are taken into account.

This approach helps improve the reliability of terminological resources and encourages consistent use of terms across documents.

In digital terminology management, storing data in standardized formats is also important. ISO 30042:2019 specifies requirements for the TermBase eXchange (TBX) format, which supports the structured representation and exchange of terminological data [4]. Such an approach facilitates the reuse of terminology across systems, integration into translation workflows, and improved compatibility between electronic resources.

The role of terminology in multilingual translation and intercultural communication. In an increasingly globalized world, scientific and technical information is frequently exchanged across languages. The accurate organization of terminology is therefore one of the key conditions for high-quality translation. Translating specialized texts requires more than finding a lexical equivalent: the concept expressed in the source language must be represented accurately within the terminological system of the target language.

Several problems may arise in translation. First, the target language may not have an exact equivalent for a source-language term. Second, similar-looking terms may designate different concepts in different languages. Third, some professional expressions may be associated with national culture, production practices, or the traditions of a particular professional community.

Terminological dictionaries and multilingual databases are valuable in addressing these challenges [2, 3, 6]. A terminological entry that includes a definition, subject field, contextual example, approved equivalents, and source information gives translators a more reliable basis for decision-making.

Translating professionalisms requires additional care because their meanings may depend on the experience and informal communication practices of a professional group. A literal translation does not always preserve

the original meaning. Translators should therefore analyze the context and, when necessary, use an explanatory translation or select a functionally appropriate expression in the target language.

When multilingual terminological resources are developed, it is particularly important to verify the semantic equivalence of terms across languages. In addition to grammatical form, the concept's meaning, subject-field specificity, and practical usage must be considered.

Digital technologies and future directions in terminology. The development of digital technologies is transforming the ways in which terminological data are collected, processed, stored, and disseminated [4, 6]. Electronic dictionaries, terminology databases, text corpora, machine translation, and artificial intelligence tools offer new opportunities for analyzing specialized vocabulary.

Electronic terminology databases can store terms in a unified system, link them to definitions and translation equivalents, identify duplicate or inconsistent entries, and track updates [4, 6]. Such systems are particularly useful for organizations, translation services, and research institutions that operate in multiple languages.

Artificial intelligence and natural language processing technologies can support automatic term extraction, contextual analysis, and the identification of semantic relationships between terminological units. However, not every unit identified automatically should be treated as an established term. Distinguishing general vocabulary from professional jargon, abbreviations, and polysemous expressions requires contextual analysis and review by subject-field experts.

Another important direction is the development of terminological competence. Professionals need not only to know the terms of their field, but also to select, define, translate, and explain them appropriately for different audiences. These skills should be developed through professional education, continuing training, and lifelong learning.

Digital terminology work must also address the reliability of data, linguistic and cultural differences, the regular updating of resources, and accessibility for users. Technological tools can accelerate terminological work, but scientifically grounded analysis remains essential when interpreting concepts and making normative decisions.

The study of terms and professionalisms is important for understanding how specialized vocabulary is formed, used, and developed. The analysis presented in this article leads to several conclusions.

First, a term designates a concept within a particular field of knowledge or activity and primarily serves to communicate specialized information accurately and consistently. The effectiveness of a terminological system depends on clear definitions, explicit conceptual relationships, and consistent use of designations.

Second, professionalisms are specialized lexical units that emerge in the practical activities and everyday communication of professional communities. Although they share certain features with terms, they may differ in their scope of use, stylistic characteristics, and normative status. The boundary between the two categories is dynamic, and the status of particular expressions may change over time.

Third, terminology standardization and management help ensure the accuracy, consistency, and reliability of specialized vocabulary. The main stages include collecting terms, clarifying concepts, documenting synonyms and variants, disseminating approved forms, and regularly updating terminological resources.

Fourth, terminological consistency in multilingual communication improves translation quality and supports the accurate transfer of concepts between languages. The meaning, subject-field specificity, and contextual use of a term must be considered alongside its lexical form.

Fifth, digital technologies expand the possibilities for organizing and processing terminological data. Nevertheless, automated results should be reviewed through terminological expertise, particularly when dealing with polysemous units and context-dependent professionalisms.

Overall, a key objective of contemporary terminology work is to preserve conceptual precision while ensuring that specialized vocabulary can be used, translated, and understood effectively by different audiences. The systematic study of terms and professionalisms therefore provides an important theoretical and practical foundation for improving professional communication, transmitting scientific knowledge, and developing multilingual terminological resources.

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ТРАНСФОРМАЦИЯ ГРАММАТИЧЕСКИХ НОРМ СОВРЕМЕННОГО РУССКОГО ЯЗЫКА В УСЛОВИЯХ ЦИФРОВОЙ КОММУНИКАЦИИ

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Аннотация: В статье рассматривается проблема трансформации грамматических (синтаксических и морфологических) и пунктуационных норм русского языка в условиях цифровой коммуникации. Анализируется соотношение понятий «система языка», «норма» и «узус». На основе научных исследований описываются процессы упрощения синтаксиса, эллипсиса, функционального использования графических средств и воздействия цифровых технологий (автозамена, голосовой ввод) на речевую практику.

Ключевые слова: языковая норма, узус, цифровая коммуникация, интернет-дискурс, синтаксис, эллипсис, вариативность.

TRANSFORMATION OF GRAMMATICAL NORMS OF THE MODERN RUSSIAN LANGUAGE IN THE CONTEXT OF DIGITAL COMMUNICATION

Abstract: This article examines the transformation of grammatical (syntactic and morphological) and punctuation norms in the Russian language in the context of digital communication. The relationship between the concepts of "language system," "norm," and "language usage" is analyzed. Based on scientific research, the article describes the processes of syntax simplification, ellipsis, the functional use of graphic tools, and the impact of digital technologies (autocorrect, voice input) on speech practice.

Keywords: language norm, usage, digital communication, online discourse, syntax, ellipsis, variability.

Языковая норма — одна из центральных проблем языкознания. Она помогает сохранять единство литературного языка, делает речь понятной для разных людей и задаёт общие ориентиры для употребления языковых средств. При этом язык не остаётся неподвижным: он развивается вместе с обществом, культурой и условиями общения.

Актуальность темы обусловлена масштабным переходом повседневного, профессионального и публичного общения в цифровую среду (мессенджеры, социальные сети, блог-платформы, электронную почту). Быстрый обмен текстовыми сообщениями формирует специфические речевые привычки, которые оказывают прямое влияние на способы построения высказываний, структуру предложения, использование знаков препинания и выбор морфологических форм [1; 3].

Цель статьи — выявить основные изменения в употреблении грамматических норм русского языка под влиянием цифровой среды и определить, как они соотносятся с литературной нормой.

В работе используются описательный и сравнительный методы, а также анализ научной литературы по вопросам языковой нормы, узуса и развития русского языка. Рассмотрены процессы сокращения и упрощения синтаксических конструкций, пропуск слов, распространение неполных предложений, изменение пунктуационного оформления и взаимодействие письменной и устной речи.

Грамматическая норма — это исторически сложившиеся, социально одобряемые и зафиксированные в кодификационных источниках правила образования форм слов, построения словосочетаний и конструирования предложений в литературном языке. Она выступает фундаментом языковой системы, обеспечивающим структурное единство, стабильность и преемственность литературного языка на разных этапах его функционирования. Грамматическая норма охватывает два ключевых уровня языковой структуры: морфологический и синтаксический.

Морфологические нормы регламентируют процессы словоизменения и формообразования. Они определят правильный выбор и варьирование падежных окончаний (например, разграничение форм

именительного падежа множественного числа *-а/-я* и *-ы/-и*), категориальных показателей рода, числа и одушевлённости существительных, степеней сравнения прилагательных и наречий, а также форм спряжения, времени, вида и наклонения глаголов. Ошибки или варианты на этом уровне непосредственно затрагивают морфемную и словоизменительную структуру слова.

Синтаксические нормы регулируют правила соединения слов в единые смысловые и грамматические блоки (словосочетания) и организацию этих блоков в простые и сложные предложения. Они обеспечивают корректность синтаксической связи — согласования, управления и примыкания, определяет нормированный порядок слов в предложении, а также правила построения сложных конструкций (причастных и деепричастных оборотов, придаточных частей).

Функционально-коммуникативное значение грамматической нормы выходит далеко за рамки чисто формального ограничения речевой свободы или прескриптивного контроля. Главное предназначение нормы заключается в обеспечении максимальной точности, ясности и однозначности передачи смысловой информации. Строгая грамматическая организованность текста минимизирует риски двусмысленности и коммуникативных сбоев: благодаря последовательному соблюдению грамматических связей адресат сообщения способно беспрепятственно и с минимальными ментальными усилиями идентифицировать:

Субъект и объект действия (кто совершает действие и на что оно направлено);

Временную и локативную локализацию событий;

Логические, причинно-следственные, условные, уступительные и целевые отношения между элементами высказывания.

Таким образом, грамматическая норма является ключевым механизмом информационной эффективности коммуникации, защищающим текст от смысловой деформации и помогающим участникам речевого акта достигать полного взаимопонимания.

Для понимания языковых процессов необходимо разграничивать три взаимосвязанных понятия:

Система языка — совокупность единиц и закономерностей, задающих потенциальные возможности создания высказываний.

Норма — исторически сложившийся, общественно признанный и кодифицированный выбор языковых средств.

Узус — реальная практика употребления языка носителями в разных коммуникативных ситуациях [3].

Между узусом и нормой неизбежно возникают расхождения. В цифровой коммуникации интернет-пользователи активно формируют новые речевые привычки, создавая явление «отложенной нормы», когда речевая практика меняется быстрее, чем её успевает зафиксировать академическая кодификация [1]. Однако высокая частотность употребления той или иной формы в узусе само по себе не делает её автоматически нормативной.

История русского литературного языка показывает, что норма всегда формируется как баланс между устойчивостью и изменчивостью. Устойчивость необходима для преемственности поколений, а изменчивость — для адаптации к новым коммуникативным потребностям.

Любое языковое нововведение проходит путь от единичного употребления (окказионализма) до системного элемента узуса, после чего при условии долговечности, функциональной оправданности

и поддержки образованной частью общества может быть зафиксировано в нормативных справочниках.

Историко-литературный процесс показывает, что норма всегда формируется на стыке различных речевых стилей и коммуникативных практик. Ключевую роль в становлении современной русской литературной нормы сыграл А. С. Пушкин, который сумел органично синтезировать три мощных языковых пласта: строгость книжно-славянской традиции, непринуждённость живой разговорной речи дворянского обихода и стилистическую гибкость европейской (в первую очередь французской) литературной культуры. Пушкинский язык стал уникальным эталоном баланса: он продемонстрировал, как синтаксические конструкции могут сохранять высокую литературную организованность и логическую стройность, но при этом стремительно приближаться к естественности, лёгкости и ясности живого устного общения, освобождаясь от архаичной громоздкости XVIII века.

В XXI веке функцию полигона для взаимодействия разных речевых стилей берёт на себя интернет. Сегодня цифровая среда выполняет коммуникативную и языкотворческую функцию, в чём-то аналогичную роли художественной литературы XIX века: она служит глобальным пространством массового и непрерывного взаимодействия традиционной письменной нормы и устно-разговорных форм речи. Если в пушкинскую эпоху синтез книжного и разговорного элементов происходил преимущественно на страницах художественных произведений и в интеллектуальных салонах, то в современных условиях конвергенция устной и письменной речи осуществляется в мессенджерах, социальных сетях, блогах и комментариях, где миллионы пользователей ежедневно формируют новые гибридные формы коммуникации [3].

Цифровая переписка занимает промежуточное (гибридное) положение между письменной и устной речью. Высокая скорость обмена сообщениями и установка на диалогичность определяют следующие языковые особенности:

Вместо сложных синтаксических конструкций пользователи часто предпочитают делить мысль на последовательность коротких автономных реплик [4].

Пример: «Я уже дома. Всё нормально. Напишу позже» вместо сложного предложения «Я уже дома и всё нормально, поэтому напишу позже».

Эллипсис (пропуск очевидных элементов высказывания) обусловлен стремлением передать максимум информации с наименьшими речевыми усилиями [4]. В контексте чата фразы «Ты где?» — «На паре» являются коммуникативно достаточными, хотя формально предложения остаются неполными.

В неформальной переписке часто опускаются финальные точки и заглавные буквы, а эмоционально-интонационный рисунок речи компенсируется партитурой эмодзи, повторами знаков («???») и использованием CAPS LOCK. Отсутствие точки в чате выполняет жанровую функцию (сигнал незавершённости диалога), однако перенос этих привычек в официально-деловой или научный стиль квалифицируется как ошибка [2].

На современный узус оказывает влияние применение цифровых инструментов:

- автопроверка правописания поддерживает нормативность, но снижает

рефлексию над текстом.

- предиктивный ввод ускоряет набор, но подталкивает к клишированию.

- голосовой ввод преобразует устную речь в письменную, деформируя

традиционную синтаксическую и пунктуационную структуру [3].

Объективная научная оценка любой языковой инновации — будь то грамматическое упрощение, синтаксический эллипсис или графическая трансформаторная форма — должна опираться на строго подчинённый функционально-стилистический контекст и ситуативную уместность.

В сфере неформального цифрового общения (чаты, личная переписка в мессенджерах, комментарии в социальных сетях) такие явления, как синтаксический эллипсис, опускание знаков препинания, использование неполных предложений и графические упрощения, являются коммуникативно и функционально оправданными. Они служат инструментом языковой экономии, обеспечивают высокую скорость обмена репликами и компенсируют отсутствие устной интонации и жестикуляции. В данном регистре преобладает дескриптивный принцип: форма подчинена задаче мгновенной и непринуждённой передачи мысли.

В академическом и официально-деловом дискурсе, напротив, фундаментальный приоритет безусловно сохраняется за традиционной кодификацией, строгой грамматической выверенностью, логической связностью и понятийно-терминологической точностью. В официальных документах, научных статьях, отчётах и учебных материалах любые проявления неформального интернет-узуса воспринимаются как стилистический диссонанс или речевая ошибка, поскольку они разрушают смысловую однозначность текста и снижают его информационную достоверность.

Таким образом, современные языковые процессы требуют от носителя языка не механического следования единым запретам, а развитой коммуникативной компетенции — способности дифференцировать языковые средства и гибко переключаться между функциональными стилями в зависимости от цели общения, адресата и формата коммуникации.

Для дифференциации временного фата или ошибки от устойчивой языковой тенденции следует использовать комплекс критериев:

Соответствие внутренним закономерностям системы языка.

Регулярность и широта распространения (выйти за пределы узкой группы).

Оценка и фиксация нормативными справочниками.

Функциональная целесообразность и отсутствие двусмысленности.

Устойчивость явления во времени.

Заключение

Грамматическая норма продолжает оставаться основным институтом, обеспечивающим единство литературного языка, ясность коммуникации и понятность текстов для всех членов общества.

Цифровая коммуникация сформировала специфический гибридный регистр речи, сочетающий графическую форму фиксации с устно-разговорной спонтанностью, динамикой и диалогичностью

Наблюдаемые в интернет-дискурсе явления — упрощение синтаксиса, массовый эллипсис, отказ от традиционных пунктуационных знаков, замена интонаций графическими символами и эмодзи — являются естественными адаптационными механизмами языка к требованиям высокой скорости обмена информацией

Узус цифровой среды опережает академическую кодификацию, создавая ситуацию «отложенной нормы». Однако высокая частотность речевого явления в мессенджерах не превращает его автоматически в литературную норму

Алгоритмы автопроверки, предиктивного ввода и голосового интерфейса оказывают двоякое действие: с одной стороны, они помогают поддерживать базовый уровень грамотности, с другой — способствуют стилистическому клишированию и снижению речевой рефлексии пользователей

Ключевой задачей современного образования и культуроречевой практики является развитие у носителей языка гибкой коммуникативной компетенции — умения четко разграничивать сферы общения, применять неформальные цифровые приёмы в чатах и безупречно следовать строгой литературной норме в официальном, публичном и академическом дискурсе.

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ARTIFICIAL INTELLIGENCE IN MODERN PEDAGOGY: A HUMAN-CENTERED FRAMEWORK FOR PERSONALIZED LEARNING AND TEACHING

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Abstract. Artificial intelligence (AI) can support pedagogical differentiation, but the production of individualized content does not by itself constitute personalized education. This conceptual review examines how teachers may integrate generative and predictive AI tools into classroom decision-making while retaining responsibility for learning goals, inclusion, and assessment. A structured thematic synthesis of established educational theory and selected scholarly and intergovernmental publications informs a proposed Human-Centered Personalized Pedagogy (HCPP) framework. The framework organizes implementation around learner diagnosis, co-designed goals, bounded AI scaffolding, dialogic classroom activity, evidence-based feedback, and teacher-led review. It also identifies safeguards addressing inaccurate output, language inequity, data minimization, and dependence on automated assistance. Rather than reporting experimental outcomes, the article supplies a theoretically grounded model and a set of indicators that future studies can evaluate. The analysis argues that meaningful personalization requires changes in instructional interaction and learner agency, not merely a higher volume of AI-generated exercises.

Keywords: artificial intelligence; personalized learning; human-centered pedagogy; differentiated instruction; teacher agency; educational ethics

1. Introduction

Personalized learning is widely invoked as a promise of educational technology, yet personalization can mean very different things. In its narrow form, a system changes the difficulty of a worksheet or recommends the next question. In a stronger pedagogical form, instruction responds to learners' prior knowledge, language backgrounds, interests, misconceptions, and developing capacity for self-direction. Generative AI extends the range of possible adaptations by producing explanations, examples, practice activities, and dialogues quickly. Its flexibility, however, also increases the possibility that an apparently appropriate response is factually wrong or pedagogically unproductive (Kasneci et al., 2023).

A central question is therefore not whether AI can generate individualized materials, but under which instructional conditions individualized support improves opportunities for learning. UNESCO (2023) emphasizes human agency and appropriate safeguards, while UNESCO (2021) places equity and inclusion within educational AI policy. These principles suggest that the teacher's diagnostic and relational work cannot be outsourced to an automated model. This paper develops a teacher-governed implementation framework that connects AI affordances with instructional judgment, learner choice, and accountability.

2. Methodological Approach

The article employs a conceptual integrative review rather than a systematic review or empirical experiment. Sources were purposefully selected for their relevance to three intersecting domains: generative AI in education, human-centered governance of AI, and established principles of pedagogy and self-regulated learning. The corpus includes UNESCO policy guidance and peer-reviewed educational analyses (UNESCO, 2021, 2023; Kasneci et al., 2023; Tlili et al., 2023; Zimmerman, 2002).

The analytical procedure comprised four steps: identifying recurring opportunities and risks; distinguishing automation from pedagogical personalization; translating the themes into an instructional sequence; and deriving observable implementation indicators. The synthesis is interpretive, not a quantitative estimate of effectiveness. No classrooms, teachers, or students were recruited; no original learning-outcome data were collected. The proposed framework is therefore a design proposition requiring subsequent field validation.

3. Results: The Human-Centered Personalized Pedagogy Framework

The synthesis supports six linked design phases. First, the teacher establishes a learning profile using low-stakes diagnostic tasks, student explanations, and contextual information learners voluntarily provide. AI may help draft diagnostic items, but teachers check their curricular validity and avoid feeding sensitive student records into public systems. Second, teachers and students negotiate goals that are comprehensible and revisable; this converts personalization from opaque algorithmic placement into a transparent learning agreement.

Third, AI-generated scaffolds are bounded by explicit instructional constraints. A teacher can request two explanations of the same mathematical or linguistic concept, one using everyday language and another using a disciplinary representation, but must inspect both for accuracy and assumptions. Fourth, learners compare explanations, challenge outputs, discuss errors, and produce independent responses. This dialogic step preserves critical reasoning and peer interaction instead of replacing them with solitary chatbot use.

Fifth, the teacher gathers evidence from short retrieval tasks, oral explanations, revision histories, and learner reflection. The system may suggest feedback, but the teacher decides which errors are conceptually important. Sixth, instruction is adjusted using this evidence and students reflect on whether assistance made them more capable of independent performance. The sequence is cyclical: new evidence updates goals rather than locking learners into fixed categories.

Across these phases, the framework assigns distinct responsibilities. AI generates options and potentially useful patterns; learners make and justify choices; teachers validate disciplinary accuracy, sustain equitable participation, and interpret progress. The model does not presume that AI outputs are neutral. Educators should scrutinize stereotyped examples, inappropriate reading levels, and limited support for underrepresented languages before materials are used.

4. Discussion

An important distinction emerges between customization of instructional content and personalization of educational relationships. The former can be scaled through automation; the latter depends on trust, interpretive judgment, and shared understanding of learner needs. A large number of AI-created tasks could produce the appearance of differentiation while leaving the curriculum, classroom discourse, and assessment unchanged. The HCPP framework treats the quality of student reasoning and autonomy as higher-order criteria than the quantity of generated material.

Three implementation tensions require attention. Efficiency may conflict with deep learning when teachers accept fluent outputs without checking them. Inclusion may conflict with rapid deployment when language varieties, disability accommodations, and connectivity are neglected. Personalization may conflict with privacy when highly detailed learner profiles are collected without necessity. UNESCO (2023) offers a governance rationale for limiting data collection, involving stakeholders, and maintaining human oversight. Schools should also communicate when AI is used and establish a route for contesting inappropriate recommendations.

For future empirical research, the model suggests a cluster-randomized or carefully matched classroom comparison in which AI-supported differentiation is contrasted with teacher-designed differentiation using the same instructional objectives. Outcome measures should include independently completed assessments, improvement in explanations, students' perceived agency, teacher workload, access disparities, and incidents of inaccurate feedback. Implementation fidelity should be measured separately from learning outcomes so that low effects are not mistakenly attributed to the technology alone.

5. Practical Implications

Teacher education programs can translate the model into a short design cycle: produce an AI-assisted lesson variant, identify two likely hallucinations or biases, design a non-AI alternative, and test whether students can perform independently after support is withdrawn. Administrators should provide approved tools, clear usage policies, and time for collaborative moderation rather than treating access to a chatbot as professional development. Evaluation should prioritize observable pedagogical benefits and equitable access over platform adoption rates.

5. Classroom Implementation: Planning for Differentiation

Implementation begins with an instructional problem rather than a technology purchase. For example, an English-language teacher may identify that students can recall vocabulary but struggle to use it in context. A diagnostic sequence could ask students to interpret a short passage, explain their reasoning orally, and write a response for a familiar audience. The teacher then reviews errors and establishes two or three learning pathways. An AI system may draft contextualized dialogues at contrasting levels, but the teacher checks whether each dialogue actually illustrates the targeted linguistic feature. Such planning avoids confusing surface variety with cognitive progression. Students must also be permitted to complete equivalent activities without an AI account or personal device.

A practical lesson may use four phases: orientation, guided comparison, independent production, and reflection. During orientation, the teacher explains the goal and the limits of any AI-generated material. In guided comparison, small groups examine two explanations, locate ambiguities, and propose improvements. In independent production, learners complete a transfer task without automated suggestions. In reflection, learners identify which scaffold was useful and which was misleading. This sequence creates an observable distinction between receiving assistance and acquiring competence. A teacher can compare early and later explanations, looking not merely at correctness but at the specificity of reasoning and the appropriateness of examples.

6. Inclusion, Accessibility, and Language Equity

AI-supported personalization can improve access when it provides alternative formats, plain-language explanations, and additional practice opportunities. Yet the same system may reproduce social or linguistic inequalities. Models can underperform on local terminology, dialectal expressions, and low-resource languages; an output that appears fluent may nevertheless misrepresent cultural practices. Educators should examine whose examples and experiences are represented, whether accessibility adaptations preserve disciplinary meaning, and whether students are expected to disclose sensitive circumstances to receive support. Inclusive personalization therefore calls for choice and universal design, not compulsory profiling. A learner should be able to request help without being categorized by potentially stigmatizing characteristics.

Schools can create a minimal-risk protocol. Teachers use synthetic student profiles when testing prompts, remove identifiable records before analysis, retain only information essential to a clear educational purpose, and seek institutional approval where needed. For accessibility, the same concept may be presented as written explanation, structured vocabulary list, or teacher-led conversation. These

alternatives should be assessed against the same learning objective. AI should not become a separate lower-expectation curriculum for students with disabilities or less access to technology. Human review is essential to keep the adaptations equivalent in intellectual demand and educational dignity.

7. Evaluation and Research Agenda

The framework can be studied using a mixed-methods design. A future investigation could compare two sequences covering equivalent curricular content, one incorporating teacher-verified AI scaffolds and one relying on conventional differentiated materials. Outcome measures should include concept retention, ability to transfer knowledge to unfamiliar tasks, student explanation quality, and self-regulated learning behaviors. Classroom observations and teacher interviews could illuminate whether AI reduced preparation burden or simply shifted effort to verification. These are proposed measurements, not findings from the present article. Randomization or matched comparison may reduce selection bias, while transparent reporting of implementation fidelity would clarify what the intervention actually involved.

Further studies should document access constraints, student proficiency, discipline, and teacher experience. An intervention that works with older learners in a well-connected institution may not generalize to primary classrooms or rural settings. Researchers should explicitly report model version, prompt protocols, teacher corrections, and the use of student information, since these choices can materially alter the intervention. Long-term inquiry is particularly important: short-term satisfaction with tailored explanations is not adequate evidence of durable independence. An ethically sound evaluation also solicits student perspectives on autonomy, fairness, and whether assistance affected their willingness to persist with difficult tasks.

8. Practical Recommendations for Educational Leaders

Institutional leaders can support adoption by establishing approved use cases, review procedures, and time for collaborative lesson design. A pilot could focus on a small number of well-defined objectives, with teachers documenting an example generated by AI, the correction they made, and the resulting student task. Professional learning meetings can compare these cases to develop local standards of quality. Evaluation criteria should privilege learning evidence over counts of generated worksheets or logins. A decision to expand adoption should follow an assessment of equity, staff workload, and data stewardship, rather than simply positive impressions of technical novelty.

This approach also changes teacher professional development. Instead of one-off training on prompt formulas, teams can practice checking disciplinary errors, adapting explanations to developmental stages, designing non-AI alternatives, and discussing ambiguous cases. Students can be taught to ask how an answer was justified and when independent verification is required. Administrators should provide mechanisms for reporting inaccurate or inappropriate output without blaming teachers or learners. These routines frame AI as an accountable instructional resource whose value remains contingent on informed human decision-making.

6. Conclusion

AI can expand the repertoire of differentiated materials and formative supports, but effective personalization depends on teacher interpretation and learner participation. The proposed HCPP framework supplies six instructional phases and accompanying safeguards for human-centered implementation. Its contribution is conceptual: subsequent classroom studies must determine feasibility, equity, and measurable learning effects across subjects and educational contexts.

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GENERATIVE ARTIFICIAL INTELLIGENCE IN FORMATIVE ASSESSMENT: TRANSFORMING FEEDBACK, STUDENT AGENCY, AND LEARNING OUTCOMES

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Abstract. Generative artificial intelligence offers rapid feedback, rubric drafting, and explanatory dialogue, yet speed is not equivalent to formative quality. This conceptual review integrates established formative assessment theory with contemporary guidance on generative AI to propose a Feedback–Interpretation–Action (FIA) cycle for classroom use. The framework distinguishes feedback accuracy, students' interpretation of comments, and demonstrable revision or transfer. It specifies a three-layer checking procedure—disciplinary verification, pedagogical calibration, and fairness review—and offers an illustrative protocol for written assignments. The article argues that teachers should use AI to expand opportunities for formative dialogue while retaining final judgment over consequential assessment. Because no primary student data were collected, the paper presents propositions and a research agenda rather than measured effects. Its main contribution is an auditable instructional design that evaluates whether AI feedback actually enables learners to close a learning gap.

Keywords: generative artificial intelligence; formative assessment; feedback literacy; student agency; assessment validity; pedagogical design

1. Introduction

Formative assessment is a process of eliciting and interpreting evidence so that teachers and learners can modify ongoing instruction. Classic accounts emphasize that feedback is effective only when it helps learners recognize a gap between present work and intended quality and take steps to close it (Sadler, 1989; Black & Wiliam, 1998). Generative AI challenges the practical organization of this process: it can comment on drafts within seconds, hold follow-up conversations, and rewrite explanations, but its judgments may be inconsistent, unjustified, or detached from a rubric.

The pedagogical risk is to equate abundant commentary with useful learning. Students may receive ten suggestions but have little understanding of which matter most. Some may accept fluent advice uncritically, while others may become dependent on rewriting assistance. The purpose of this paper is to articulate conditions under which AI-supported feedback strengthens, rather than bypasses, students' capacity to evaluate and revise their own work.

2. Methodology and Conceptual Foundations

This is a theory-driven integrative review of formative assessment scholarship and selected literature on generative AI in education. The core conceptual anchors are the roles of evidence and instructional adjustment (Black & Wiliam, 1998), learner recognition of quality (Sadler, 1989), the directional questions of effective feedback (Hattie & Timperley, 2007), and self-regulation (Zimmerman, 2002). Risks of bias, inaccurate output, and human oversight were examined through UNESCO (2023) and Kasneci et al. (2023).

The synthesis asked three analytic questions: What information should feedback contain? What must learners do with that information? What quality-control responsibilities remain with educators? This is not a systematic literature search, meta-analysis, intervention, or student survey. The resulting model is a theoretically reasoned proposal, and claims about future outcomes are framed as testable hypotheses.

3. Results: A Feedback–Interpretation–Action Cycle

Stage A, evidence and criteria: before any AI feedback, teachers define the learning objective, a small number of observable success criteria, and an authentic student task. Students submit a first attempt without automated rewriting. This creates evidence of unaided performance and prevents the tool from obscuring the target skill. An AI system may then produce provisional comments that cite exact passages or steps in the student's response, identify strengths, and suggest one or two high-impact revisions.

Stage B, learner interpretation: students translate comments into their own language, identify which suggestion is supported by the rubric, and reject at least one suggestion when justified. This reflective step is essential because feedback that remains only in a machine-generated message cannot demonstrate learning. Peer discussion and teacher questioning can help reveal whether students understand the underlying concept rather than merely follow surface corrections.

Stage C, action and verification: learners submit a revision log explaining what changed, why it changed, and what was not adopted. A brief transfer task assesses whether the improvement carries over to a fresh problem completed without AI. Teachers compare the original response, revision, and transfer performance to decide whether the loop has closed. If understanding remains weak, instruction changes; the system does not simply issue more comments.

4. Quality Assurance and Assessment Integrity

A practical quality gate has three layers. Disciplinary verification asks whether each AI comment is correct, evidence-based, and consistent with the intended answer domain. Pedagogical calibration asks whether suggestions are understandable at the student's level, specific enough to act on, and proportionate to the learning objective. Fairness review asks whether language variety, disability, cultural context, or writing style is being penalized without curricular reason. Teachers retain authority to discard or rewrite outputs.

For example, in an argumentative essay assignment, the approved rubric might specify claim clarity, evidence use, counterargument, and coherence. The teacher provides anonymized excerpts rather than identifiable student records when tool policy permits such use. AI drafts two evidence-linked comments; the student assesses those comments against the rubric and submits a revised paragraph plus a 120-word explanation. The teacher evaluates both the writing and the explanation. This is an illustrative design, not a report of a conducted classroom experiment.

Institutional policy should distinguish low-stakes formative support from consequential grading. Automatically assigning final grades through a general-purpose chatbot raises questions of validity, explainability, bias, and appeals. Where AI helps educators draft feedback, disclosure and verification remain necessary, particularly for children and sensitive work. UNESCO (2023) supports a human-centered, privacy-conscious approach.

5. Discussion and Research Agenda

The proposed cycle reframes AI from an evaluator of learners to a conversational resource for evaluative judgment. This distinction is consistent with assessment theory: feedback is not a product delivered to a passive recipient but information interpreted and used in an instructional process. It also exposes the limitations of metrics such as number of comments, time to first response, or model–teacher score agreement. Such measures can assess operational features, but they cannot establish that learners have developed durable understanding.

Empirical evaluations should pre-register primary outcomes such as blind-rated transfer performance and quality of student revision rationales. Secondary measures might include teacher moderation time,

feedback uptake, students' capacity to identify flawed AI comments, and distributional differences by prior attainment or language proficiency. Studies should compare at least three conditions—teacher-only feedback, unmoderated AI feedback where ethically permitted, and teacher-moderated AI feedback—while maintaining identical tasks and rubrics. Qualitative interviews could examine when learners follow, question, or ignore generated advice.

5. Feedback Design and the Learning Cycle

AI feedback becomes educationally meaningful only when learners can interpret and act on it. A useful workflow begins with a criterion-referenced task and clear success descriptors. Students produce an initial response before consulting any automated suggestion. The teacher may then request feedback that identifies one strength, one priority for improvement, and one question that prompts reconsideration. Crucially, the learner must evaluate the suggestion, decide whether to adopt it, and justify any change. Feedback that simply rewrites the entire response can produce a polished artifact while obscuring the student's understanding. Revision histories and brief oral explanations provide a better indication of whether the learner has gained competence.

An effective feedback cycle also includes a second independent attempt. After reviewing advice on argument structure, a learner might compose a new paragraph on a different prompt without AI access. The teacher then checks transfer rather than merely improved formatting on the original assignment. Students who accept a fluent but unsupported suggestion should receive an opportunity to identify why it is misleading. Such activities turn fallibility into a critical-literacy resource, provided the teacher anticipates likely errors and prevents harmful or discriminatory content from being used uncritically.

6. Assessment Validity, Integrity, and Fairness

The widespread availability of generative AI complicates inferences from take-home submissions. A well-structured essay may reflect subject knowledge, prompt engineering, editorial judgment, or extensive machine drafting. Assessment validity therefore depends on aligning permitted assistance with the construct being measured. If the goal is independent language production, a supervised writing sample may be necessary. If the goal is evidence evaluation, documented critique of an AI-generated claim can itself be an appropriate task. Institutions should communicate these distinctions in advance rather than treating all AI use as equivalent misconduct. Transparency is both more educationally constructive and more defensible than unreliable attempts to infer authorship from textual style.

Fairness also requires recognizing unequal access to paid subscriptions, devices, stable connections, and advanced prompting experience. A course that quietly assumes universal access may reward resources rather than competence. Teachers can provide institutionally supported access where appropriate, offer equivalent non-AI pathways, and grade the quality of reasoning against published criteria. Students should not be required to submit private information to third-party tools as a condition of assessment. Rubric moderation and the periodic review of examples across language and ability groups can reveal unintended differences in the quality of feedback.

7. A Proposed Classroom Protocol

A six-step protocol can guide responsible use. First, define the learning target and explicitly state what the student must do independently. Second, identify a constrained role for AI, such as proposing questions rather than giving full solutions. Third, prepare verification criteria and an alternative resource. Fourth, require students to annotate which suggestions were accepted or rejected, and why. Fifth, assess a revised artifact together with an independent transfer task. Sixth, invite reflection on accuracy, confidence, and the effort required to verify advice. This protocol is a pedagogical proposal and should be locally tested before claims about effectiveness are made.

For example, in a lesson on argumentative writing, students may draft an evidence-based claim, ask an approved model for counterarguments, verify all proposed sources, and revise the argument using only credible evidence. The teacher assesses the original claim, the quality of source checking, and the justification for revision. This approach makes feedback visible as a process rather than a hidden replacement of student work. In mathematical reasoning, the parallel exercise could involve evaluating multiple solution strategies, identifying an erroneous step, and explaining a correct method without assistance.

8. Research Priorities and Institutional Safeguards

Future empirical studies should distinguish feedback speed, feedback accuracy, learner uptake, and subsequent achievement. These outcomes are related but not interchangeable. A randomized or quasi-experimental classroom study could compare teacher feedback, teacher-verified AI feedback, and unrestricted model feedback on tasks with common criteria. Investigators should predefine primary measures, examine differences across learner groups, and include delayed assessments. Qualitative analysis of revision decisions would reveal why learners follow or disregard suggestions. No such comparative trial is reported here; the proposed design is a research agenda arising from the conceptual analysis.

At the policy level, schools need guidance on privacy, record retention, acceptable disclosure, accessibility, and routes for contesting a misleading automated recommendation. Teachers should be trained to detect fabricated references, unstable scoring, and culturally narrow assumptions. Administrators should avoid equating automated grading efficiency with educational success. A responsible program can pilot feedback generation for formative use while retaining human accountability for consequential decisions and student support. Ongoing audits should inspect both practical benefits and the possibility that increased automation displaces productive dialogue between teachers and learners.

6. Conclusion

The instructional value of AI feedback depends on verified accuracy, meaningful learner interpretation, and independent action. The FIA cycle offers a transparent design for making those requirements visible. Its practical value lies in protecting assessment validity and student agency while enabling timely support; its effectiveness remains an empirical question for future research.

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ARTIFICIAL INTELLIGENCE COMPETENCY IN TEACHER EDUCATION: A PEDAGOGICAL MODEL FOR PREPARING FUTURE TEACHERS

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Abstract. Teacher preparation programs increasingly face a mismatch between widespread access to artificial intelligence and novice teachers' ability to judge its pedagogical value. This conceptual article synthesizes teacher-knowledge theory, AI literacy research, and UNESCO's teacher competency guidance to propose an integrated model for pre-service teacher education. The Teacher AI Pedagogical Readiness (TAPR) model combines foundational AI literacy, subject-specific design, critical evaluation, ethical and inclusive practice, and reflective professional judgment. A staged teacher education pathway is proposed, progressing from analyzing AI limitations to designing, simulating, and critically reflecting on lessons. Assessment is based on defensible pedagogical decisions rather than prompt fluency alone. The article provides a sample analytic rubric and researchable propositions for program evaluation. It does not claim that the model has been experimentally validated. Its contribution is a curriculum-oriented account of how to prepare teachers to use AI as a bounded professional resource while safeguarding student learning, privacy, and teacher autonomy.

Keywords: teacher education; AI literacy; pedagogical competence; pre-service teachers; technological pedagogical content knowledge; professional ethics

1. Introduction

The rapid diffusion of generative AI creates a new problem for teacher education: candidates may be able to obtain plausible lesson plans without knowing how to evaluate them. Technical familiarity with a chatbot is not the same as professional readiness to teach with AI. Teachers must decide whether a generated explanation is accurate, whether a learning activity supports the intended cognitive demand, whether examples respect learner diversity, and whether data handling is appropriate.

The technological pedagogical content knowledge (TPACK) tradition argues that effective technology integration requires interaction among content, pedagogy, and technological affordances (Mishra & Koehler, 2006). Shulman's account of teacher knowledge further highlights the transformation of subject matter into teachable representations (Shulman, 1986). These perspectives help explain why generic AI tutorials are insufficient as a stand-alone preparation strategy. UNESCO's AI competency framework for teachers (2024) also emphasizes human-centered values, ethics, foundations, pedagogy, and professional learning. This article turns those ideas into a sequenced program model.

2. Methodological Approach

The study uses conceptual synthesis to connect three literatures: teacher knowledge and instructional design (Shulman, 1986; Mishra & Koehler, 2006), AI literacy competencies (Long & Magerko, 2020), and policy-oriented teacher AI competencies (UNESCO, 2024). Selected research on large language models and educational risks provides contextual support (Kasneci et al., 2023; UNESCO, 2023).

The procedure involved identifying common competence domains, distinguishing technical procedures from professional decisions, mapping competence development onto teacher-education activities, and defining observable assessment evidence. Source selection was purposive rather than exhaustive. No survey, participant observation, or intervention took place. The model should be treated as a curriculum proposal pending local co-design and empirical assessment.

3. Results: The Teacher AI Pedagogical Readiness Model

Dimension 1, foundational AI literacy, covers what generative models can and cannot do. Candidates explain probabilistic text generation in accessible terms, distinguish fluent language from established evidence, recognize hallucinations, and identify situations where automated output must not be trusted. The expected product is not a technical examination of machine learning mathematics but an informed explanation of capabilities and limitations relevant to classroom decisions.

Dimension 2, subject-specific pedagogical design, requires candidates to align AI-supported activities with curriculum objectives, disciplinary epistemology, and learner developmental stages. A science teacher should judge the validity of a model-generated explanation of a physical process; a language teacher should judge whether suggested corrections support communicative competence rather than merely stylistic conformity. Candidates must show that they can construct a suitable non-AI alternative.

Dimension 3, critical evaluation, asks candidates to verify factual statements against credible references, test prompts with intentionally ambiguous cases, and detect fabricated citations or overconfident answers. Dimension 4, ethical and inclusive practice, addresses privacy, intellectual property, learner consent where appropriate, bias, accessibility, and differences in connectivity. Dimension 5, reflective professional judgment, requires candidates to document why an AI-assisted intervention was selected, modified, or rejected and what evidence would justify changing the decision.

These dimensions should be taught as mutually reinforcing rather than isolated software skills. A candidate can demonstrate sophisticated prompting and still fail to notice that an activity excludes students with low connectivity; conversely, an ethically aware candidate may need more guidance in disciplinary accuracy checking. Program assessment therefore requires multiple forms of evidence.

4. A Four-Stage Preparation Pathway

Stage 1, inspect: teacher candidates compare AI-generated and human-authored instructional resources, annotate at least three content or pedagogical concerns, and explain their significance. Stage 2, design: candidates create a lesson sequence with an explicit objective, expected misconceptions, a justified role for AI, a non-AI fallback, and a student-data protection plan.

Stage 3, simulate: in a microteaching session, peers enact diverse learner responses while the candidate adapts instruction. The evaluator can introduce an erroneous AI-generated suggestion to observe whether the candidate verifies it before classroom use. Stage 4, reflect: candidates collect structured peer feedback, inspect whether the intended reasoning actually occurred, and submit a revision memo with specific improvements. The cycle repeats in disciplinary methods courses and supervised practicum.

A workable assessment rubric uses five criteria: subject accuracy, pedagogical alignment, critical AI evaluation, inclusion and data safeguards, and reflective justification. Each criterion can be rated on a four-level scale from 1 (unsupported or unsafe decisions) to 4 (well-justified, verified, and responsive decisions). The total is descriptive rather than a validated psychometric score. Institutions should test inter-rater agreement and revise descriptors before using the rubric for high-stakes certification.

5. Discussion and Institutional Implementation

The TAPR model rejects an instrumental view in which teacher readiness is measured by the number of AI tools known. Professional competence requires knowing when not to use an AI system, how to recognize misleading outputs, and how to maintain a classroom culture of inquiry. UNESCO (2024) offers a useful foundation for situating these skills within broader teacher development, but implementation must be adapted to subjects, age groups, institutional infrastructure, and national requirements.

Teacher education institutions can begin by mapping existing course assignments onto the five dimensions, training supervisors to apply the same evaluation criteria, and providing safe practice environments with synthetic rather than real student data. Faculty development is essential: candidates are unlikely to learn critical oversight if instructors themselves use automated outputs uncritically. Procurement and policy processes should include privacy assessment and accessibility considerations, alongside educational usefulness.

Future studies can examine changes in lesson-plan quality, error-detection accuracy, and microteaching performance before and after the pathway. Longitudinal follow-up during teaching practice would be particularly valuable because confidence with tools may not predict competent classroom action. Cross-disciplinary analysis could establish where subject differences require specialized indicators and where a common competency foundation is appropriate.

6. Curriculum Integration Across Teacher Education

A teacher-education program should not isolate AI competence in a single technical elective. Foundational coursework can introduce model limitations, data literacy, and critical verification; subject-methods courses can examine how AI changes lesson design in specific disciplines; practicum seminars can require students to justify real instructional choices. This distributed model helps candidates connect technical capabilities to theories of learning, curricular purposes, and professional obligations. It also prevents competence from being reduced to memorizing prompt templates that may quickly become obsolete as interfaces change. Faculty teams can map program-level outcomes to existing courses and identify places where explicit assessment evidence is missing.

In a language-teaching methods course, for example, a candidate might examine AI-generated speaking prompts for communicative authenticity, age appropriateness, and cultural representation. A science-teaching candidate could test whether generated analogies distort an underlying mechanism. A history-teaching candidate could evaluate citations and the presentation of contested interpretations. Across these tasks, candidates should report their verification strategy, revision decisions, and a meaningful alternative when AI is not suitable. Such disciplinary cases make the connection between AI literacy and pedagogical content knowledge concrete.

7. Performance Assessment and Quality Assurance

An assessment portfolio could contain an annotated AI response, a lesson plan, evidence from microteaching, an ethical-risk review, and a reflection on student learning. Reviewers would assess accuracy of subject content, alignment with objectives, the quality of verification, accessibility, and the clarity of professional judgment. A shared rubric supports consistency, but its scores must not be described as validated measures without empirical study. Moderation sessions can help instructors agree on what constitutes adequate evidence and what kinds of errors indicate a need for further training. The portfolio should emphasize decisions and revisions rather than the volume of tool use.

Quality assurance also needs an explicit feedback loop. Candidates who fail to identify an invented reference should be given a new verification challenge, targeted feedback, and an opportunity to demonstrate improvement. Instructors should periodically replace examples because model behavior changes over time. To study rubric quality, institutions can collect independently rated samples and examine agreement, discriminability, and differences across subjects. Such activities constitute a program-evaluation plan, not results of the present conceptual study. High-stakes decisions must remain explainable and open to review.

8. Equity, Professional Responsibility, and Institutional Capacity

Preparation for AI use is incomplete unless candidates can work under diverse infrastructure conditions. Rural placements, schools with shared devices, and learners who need assistive formats may require different strategies. Candidates should show how learning objectives can be achieved without automated assistance and how teaching materials can be checked for accessibility. They should also understand when data protection rules or institutional policy prohibit the submission of student records to external services. The ability to decline a tool on defensible grounds is a positive demonstration of professional competence rather than a failure to innovate.

University leaders can support these practices through faculty workshops, vetted examples, approved data-handling procedures, and partnerships with schools that expose candidates to realistic constraints. Teachers need time to compare tools and audit errors; otherwise AI integration may add hidden workload. Continuous professional development should monitor emerging risks without assuming that every new feature has educational value. Partnerships should include mentor teachers, accessibility specialists, and student representatives so that implementation reflects the classroom community rather than solely the priorities of technology providers.

9. Directions for Empirical Validation

The proposed model invites research at three levels. At the candidate level, studies can assess error detection, lesson-plan quality, and the articulation of ethical reasoning before and after a designed learning sequence. At the classroom level, observations can examine whether teachers actually preserve student participation and verify generated material during instruction. At the institutional level, researchers can assess faculty workload, equitable access, and the durability of professional learning. Mixed-methods designs are especially appropriate because survey confidence is an incomplete proxy for responsible teaching behavior. Comparative studies should document the exact tasks and safeguards used.

An additional priority is contextual adaptation. The relative importance of instructional design, verification, and data governance may vary across early childhood education, secondary subjects, special education, and university teaching. Cross-context validation would help distinguish a common competence core from necessary local extensions. Future publications should report limitations transparently, including convenience samples, differences in digital access, and rapidly evolving software capabilities. Such evidence could refine the proposed pathway into a practical, testable teacher-preparation curriculum rather than a generic declaration that teachers should become AI literate.

6. Conclusion

AI-ready teachers need more than prompt-writing proficiency: they require integrated knowledge of subject matter, pedagogy, technical limitations, ethics, and reflective decision-making. The TAPR model offers five complementary domains and a four-stage instructional pathway suitable for adaptation in teacher education programs. Its usefulness and fairness should be tested through transparent, locally grounded empirical evaluation.

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