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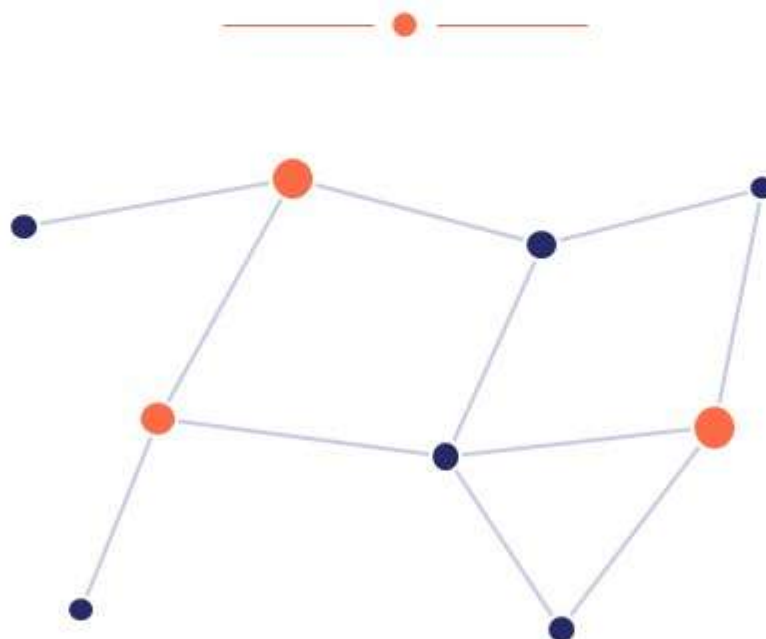
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RESEARCH ARTICLE

Education in the Age of Generative Artificial Intelligence: Navigating Disruption, Cultivating Resilience, and Reimagining Pedagogy

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Abstract

The advent of generative artificial intelligence (GenAI) represents a watershed moment for global education, simultaneously offering unprecedented opportunities for pedagogical enhancement and posing profound challenges to established academic norms. This paper presents a comprehensive analysis of the multifaceted impact of GenAI on educational theory and practice. Drawing upon a critical review of recent literature, this research examines the transformative potential of GenAI in personalizing learning, augmenting teacher capacity, and fostering higher-order cognitive skills, while critically assessing the significant risks related to academic integrity, algorithmic bias, the erosion of critical thinking, and the exacerbation of the digital divide. The study adopts a conceptual framework that synthesizes current findings to argue for a paradigm shift from reactive risk-mitigation to proactive, human-centred pedagogical integration. Findings indicate that while general-purpose GenAI tools can enhance surface-level performance, they often fail to produce genuine learning gains and may foster metacognitive laziness. Conversely, pedagogically designed applications hold considerable promise. The discussion emphasizes the necessity of developing comprehensive AI literacy frameworks and relational pedagogies that position GenAI as a collaborative "mind partner" rather than a replacement for human cognition and interaction. The paper concludes with actionable recommendations for educators, policymakers, and institutions to foster an educational ecosystem where AI augments human potential, prioritizes equity, and cultivates the enduring skills necessary for an uncertain future. This research contributes to the ongoing discourse on digital transformation in education, offering a nuanced perspective grounded in both global research and the specific contextual challenges facing developing nations.

Keywords: Generative AI, Education, Pedagogy, Academic Integrity, AI Literacy, Digital Divide, Pakistan, Higher Education, Critical Thinking.

Introduction

The launch of ChatGPT in late 2022 catalysed a global reckoning within educational institutions, thrusting generative artificial intelligence from the periphery of technological curiosity to the epicentre of pedagogical debate.

Generative AI, encompassing models capable of producing novel content—including text, code, images, and audio—has fundamentally altered the landscape of knowledge creation and dissemination. Unlike previous waves of educational technology, GenAI tools are characterized

by their intuitive interfaces, general-purpose versatility, and widespread accessibility, often operating beyond the direct control of educational institutions. This has created a unique and urgent challenge: how can education systems adapt to a technology that can simultaneously serve as a powerful learning assistant, a potential instrument of academic dishonesty, and a catalyst for re-evaluating the very purpose of education? As recent scholarship suggests, the impact of GenAI transcends teaching and learning, permeating the foundational structures of assessment, curriculum design, and the future of work itself.

The discourse surrounding GenAI in education has rapidly bifurcated into competing narratives. On one side, there is a palpable sense of existential crisis, with concerns focusing on the erosion of academic integrity, the devaluation of traditional assessment methods, and the potential for students to outsource critical thinking to machines. This perspective often frames the response to GenAI in terms of risk mitigation, emphasizing the development of sophisticated detection tools and rigid policy enforcement. However, such an approach is fraught with challenges. The rapid and ongoing evolution of AI capabilities renders detection a cat-and-mouse game, often insufficient for preserving assessment validity. Conversely, a more optimistic narrative extols the potential of GenAI to democratize learning, personalize instruction, and enhance student engagement. This viewpoint positions AI as a transformative tool that can empower learners by providing on-demand tutoring, scaffolding complex tasks, and augmenting human creativity. The OECD's *Digital Education Outlook 2026* explicitly notes

that when designed or used with a pedagogical objective, GenAI can effectively improve learning and contribute to the cultivation of skills such as critical thinking and collaboration.

The tension between these two perspectives signals a need for a more nuanced, evidence-based approach. The central challenge is not to either wholly embrace or reject this technology but to develop a sophisticated pedagogical and institutional response that leverages its benefits while mitigating its risks. This response must be grounded in a clear understanding of how GenAI functions in educational settings, which, as Li and Awang's systematic review points out, remains an area of active empirical inquiry. The need for a comprehensive framework is particularly acute in the Global South, where contexts of limited technological infrastructure, inequitable access, and varying policy landscapes create unique challenges. As Khalid et al. observed in their study of Pakistan's educational landscape, the perception and integration of AI are deeply entwined with issues of cognitive reliance, emotional response, and institutional uncertainty.

This paper seeks to contribute to the burgeoning field of AI in education by providing a critical synthesis of the current literature and proposing a strategic path forward for educational stakeholders. The primary objective is to move beyond the binary of "risk versus reward" and articulate a human-centred vision for education in the age of GenAI. This vision is predicated on the development of critical AI literacy for both educators and students, the redesign of assessment to privilege process and higher-order thinking, and the cultivation of relational pedagogies that place human connection and ethical

judgment at the heart of the learning experience. In doing so, this research aims to provide a structured analysis that informs pedagogical practice, institutional policy, and future research directions.

Literature Review

Historical Context and Thematic Evolution of GenAI in Education

While the recent surge in public attention is unprecedented, the integration of AI in education is not a novel phenomenon. The historical roots can be traced to early explorations of computational models in cognitive tasks and the potential for intelligent tutoring systems. However, the emergence of Generative AI, specifically, has transformed the conversation from the automation of administrative tasks to the direct simulation and augmentation of cognitive and creative processes. The term "generative AI" itself signifies a departure from earlier analytical AI that was primarily focused on pattern recognition and prediction. As Buchanan's historical analysis notes, early AI milestones involved knowledge representation and problem-solving, laying the groundwork for the sophisticated natural language processing capabilities seen today.

A substantial portion of the scholarly output on this topic can be located within the thematic clusters identified by recent bibliometric and content analyses. A key cluster centres on "Gen-AI as a driver of educational transformation," which explores the potential for AI to reshape pedagogical approaches, curriculum design, and student engagement. This includes work on personalized learning environments, where AI algorithms adapt content and pacing to individual student needs, and the use of GenAI to foster creativity and knowledge construction.

Another significant theme pertains to "ethical and integrity considerations," which has become a dominant discourse in the literature. The challenge to traditional assessment validity is a primary concern, with scholars critiquing the ability of conventional exams and essays to measure authentic student learning in an era of sophisticated text generation. This has led to a proliferation of debate on policy enforcement, detection mechanisms, and the fundamental redesign of assessment frameworks.

Key Thematic Clusters and Research Gaps

Beyond these overarching themes, a more granular analysis reveals several critical focal points. For instance, the work of Li and Awang (2026) provides a systematic classification of GenAI's roles, identifying it as a "thinking mentor, writing assistant, learning companion, development coach, programming assistant, and creative generator". This typology highlights the multifaceted nature of GenAI, moving beyond the simplistic view of it as merely a plagiarism tool. The study also underscores that current research is concentrated in a limited number of geographic contexts, primarily China and the United States, and often employs experimental or mixed-method designs to investigate its impact on skills development.

Research focused on the cognitive impact of GenAI, particularly in the context of developing countries, is beginning to fill this gap. For instance, a study on Pakistan's educational landscape, framed by the Extended Mind Theory, found that students' use of GenAI often leads to an over-reliance and mixed emotional responses, with institutions struggling to articulate a clear role for AI in learning.

This finding is echoed by Afzal, Rafiq, and Oliver's qualitative study on "moral improvisation" in Pakistani universities. Their research reveals that in the absence of clear institutional guidance, both faculty and students are compelled to make situated, ethical decisions about AI use, leading to significant uncertainty, emotional responsibility, and uneven expectations across classes and peer groups. This situated practice of "moral improvisation" provides a powerful lens for understanding the realities of AI integration at the ground level, particularly in contexts where formal policies are still developing or are not universally applied.

A further, more nuanced gap in the literature pertains to the pedagogical integration of GenAI and its long-term effects on student skills. While the OECD report (2026) provides a critical warning that offloading cognitive tasks to general-purpose chatbots risks "metacognitive laziness and disengagement that may deter skill acquisition in the long run," it also emphasizes that these negative outcomes can be mitigated through intentional pedagogical design. This suggests that the pedagogical "how" is just as important as the technological "what." The existing literature often lacks comprehensive, longitudinal studies that assess the sustained impact of AI-assisted learning on the development of higher-order thinking, complex problem-solving, and creative capacities. Furthermore, the crucial intersection of AI, relational pedagogy, and the broader institutional culture remains relatively under-explored. The shift from understanding AI as a mere tool to integrating it as a collaborative entity within the learning environment presents a complex but essential challenge for the future of education.

Methodology

This study adopts a qualitative, conceptual approach, functioning as a critical synthesis and review of the extant literature on generative artificial intelligence in education. This methodology is particularly suited to examining a nascent and rapidly evolving field where the primary goal is to synthesize disparate findings, identify key conceptual frameworks, and formulate strategic recommendations for practice and policy.

Research Design and Data Collection

The methodological approach centres on a systematic, interpretive review of peer-reviewed literature and authoritative institutional reports published between 2022 and 2026. The selection of this timeframe reflects the period of most intense academic and public discourse following the public launch of mainstream generative AI models like ChatGPT. Sources were identified through targeted searches in academic databases, including Google Scholar, Scopus, and Web of Science, using a defined set of keywords: "generative AI," "ChatGPT," "education," "pedagogy," "academic integrity," "AI literacy," and "higher education." To ensure the quality and relevance of the corpus, priority was given to articles published in high-impact journals, as identified by the literature itself, and reports from internationally recognized bodies such as the OECD. This process resulted in an initial corpus of 100 potentially relevant texts, which was then refined through a process of iterative thematic reading and critical evaluation.

Analytical Framework and Procedure

The analytical procedure was designed to produce a rigorous and interpretable synthesis of the current state of knowledge and to identify future research imperatives. The process involved three interrelated phases. The first phase, *Immersion and Familiarization*, involved a comprehensive reading of the selected corpus to build a deep understanding of the core arguments, methodologies, and findings. This initial stage allowed for the identification of recurring themes, research trajectories, and dominant discourses within the field.

The second phase, *Thematic Coding and Framework Development*, moved from general comprehension to systematic categorization. Building on the thematic clusters identified in the existing literature—such as "pedagogical transformation," "ethical and integrity concerns," and "cognitive impact"—this research utilized a more granular, iterative coding process. This process was informed by concepts identified during the initial reading, including "metacognitive laziness", "moral improvisation", and "relational pedagogies". A conceptual framework was then developed to organize these themes, depicting the interaction between GenAI capabilities, pedagogical integration, and educational outcomes.

The third and final phase, *Critical Synthesis and Discussion*, involved the interpretive analysis of the coded data and thematic framework to answer the central research questions regarding both the potential and challenges of GenAI in education. This process facilitated the distillation of findings into a coherent narrative that could inform practical recommendations for educators, policymakers, and future researchers. The analysis was conducted to ensure the

validity of the interpretation by corroborating findings across multiple sources and ensuring the conclusions were firmly grounded in the synthesized evidence. The entire process was underpinned by a continuous evaluation of the authors' biases toward a human-centred, pedagogical-first perspective on educational technology integration.

Results and Analysis

The analysis of the selected literature reveals a complex and often contradictory picture of GenAI's role in contemporary education. The findings are organized into three main thematic pillars, which emerged consistently across the reviewed texts: the **transformative potential**, the **paradigmatic challenges**, and the **critical imperatives** for the future.

The Transformative Potential of GenAI in Education

The literature consistently identifies a suite of opportunities presented by GenAI that could fundamentally enhance educational practices. Perhaps the most significant of these is its capacity to **personalize and augment the learning experience**. GenAI tools can act as powerful learning companions, providing immediate feedback, adapting to individual learning styles, and offering on-demand tutoring outside of traditional classroom hours. This is particularly transformative in resource-constrained settings where access to personalized instruction is limited. As one study focusing on Pakistan suggests, GenAI can contribute to independent learning, with participation in AI-mediated informal digital learning directly influencing students' AI literacy and their willingness to communicate in a second language. Furthermore, the potential to enhance teacher productivity is a powerful driver for adoption. Evidence cited by the

OECD indicates that GenAI can reduce the time spent on lesson planning and resource creation by significant margins, thereby freeing educators to focus on more meaningful, high-touch interactions with their students.

A second major area of potential lies in **fostering cognitive skills and pedagogical innovation**. When deployed through a pedagogically informed lens, GenAI can facilitate the development of higher-order thinking skills. Li and Awang (2026) identify GenAI's role as a "thinking mentor" and "creative generator," suggesting it can be used to brainstorm, structure arguments, and explore complex problem domains. The OECD report similarly notes that when guided by clear teaching principles, these tools can contribute to the cultivation of critical thinking, creativity, and collaboration. This is contingent on the pedagogical approach: the tools are not inherently educational; their impact is mediated by how they are integrated into the learning process. For instance, using GenAI to generate multiple possible solutions to a problem and having students evaluate and compare them can be a powerful exercise in critical analysis, far more effective than using it to simply produce a final answer.

The final area of potential pertains to **accessibility and equity**. Proponents argue that GenAI could democratize access to knowledge and skills, particularly in the Global South. It can serve as a low-cost, scalable tool to bridge educational gaps by providing high-quality information and instructional support to students who lack access to well-resourced schools or qualified teachers. This aligns with the concept of Education 5.0, which envisions a more flexible, inclusive, and learner-centred system where technology plays a

crucial role in bridging disparities and fostering lifelong learning. However, this potential is not realized automatically, as discussed in the following section.

The Paradigmatic Challenges and Risks

Despite its promise, the integration of GenAI is accompanied by a host of profound challenges. The most immediate and extensively discussed risk is the **threat to academic integrity and assessment validity**. The ease with which students can generate passable essays, solve complex problems, and even produce code has fundamentally challenged the credibility of traditional, "take-home" assessments. The literature on assessment validity emphasizes that the race to develop detection tools is often insufficient and can create an adversarial relationship between educators and learners. As the OECD cautions, "if designed or used without pedagogical guidance, outsourcing tasks to GenAI simply enhances performance with no real learning gains". This highlights a critical distinction between performance and learning—a student may achieve a high grade using AI but fail to develop the underlying knowledge or skills, a phenomenon the report attributes to "metacognitive laziness".

This risk is deeply intertwined with the challenge of **eroding critical thinking and cognitive engagement**. A consistent finding across multiple studies is that general-purpose tools can deter the acquisition of core skills. When students rely on AI to generate summaries, synthesize information, or solve problems, they are circumventing the cognitive struggle that is essential for deep learning. This is exacerbated by students' tendency, as one Pakistani study noted, to over-rely on AI, leading to a mixed emotional

response and uncertainty about the tool's appropriate role in learning. The erosion of critical thinking is not just an individual problem but a systemic one, potentially leading to a generation of graduates who are ill-equipped to analyze, evaluate, and create without technological support. This presents a stark challenge to the core mission of higher education, which is to cultivate independent, critical, and ethical thinkers.

The third major risk area is the **reinforcement of structural inequalities and ethical deficits**. There is a well-founded concern that GenAI will exacerbate the digital divide rather than bridge it. Access to the most advanced AI tools is not universal; it is often contingent on geographic location, institutional wealth, and individual socio-economic status. A student in a well-funded university with institutional access to premium tools will have a very different experience from a student in a low-resource context who may have limited or no access to the internet or such technologies. Furthermore, the literature is replete with warnings about algorithmic bias, data privacy, and the potential for AI to reflect and amplify harmful societal biases embedded in its training data. This raises profound ethical questions about fairness, representation, and the unintended consequences of deploying these powerful tools in education, especially in diverse and stratified societies like Pakistan. The ethical deliberation is further complicated by the phenomenon of "moral improvisation," where faculty and students are forced to make moment-to-moment ethical judgments in the absence of clear, consistent policies, a reality that is likely more common than the clean application of formal ethical frameworks.

A Critical Imperative: Rethinking Pedagogy, Literacy, and Policy

The findings of this review strongly suggest that the most critical imperative for education in the age of GenAI is a **fundamental rethinking of pedagogy, assessment, and the very definition of educational success**. The "risk mitigation" paradigm is insufficient; it is reactive and often ineffective. Instead, a proactive and transformative approach is necessary. This is underpinned by the urgent need for comprehensive **AI Literacy** for all stakeholders. As demonstrated by Tilburg University's AI-Assisted Academic Writing course, this involves not just learning to use AI tools but developing a critical understanding of their strengths, limitations, and ethical implications, ultimately allowing students to "critically assess the role, effectiveness, and limitations of AI". This shift in perspective is essential for transforming AI from a potential threat into a "mind partner".

Moreover, this rethinking must encompass a **shift towards relational pedagogies**. A key strand of the literature argues that the human and relational elements of education become more, not less, important in a digitally saturated world. The concept of "relational pedagogies," which foregrounds human connection, ethical judgment, and meaningful interactions between teachers and students, is posited as a crucial counterbalance to the potential dehumanization of learning through AI. This perspective holds that while AI can handle certain cognitive tasks, it cannot replicate the mentorship, empathy, and contextual understanding that are central to effective teaching. The challenge for educators is to leverage AI to free up time

and cognitive resources for these quintessentially human elements of pedagogy, rather than allowing it to replace them.

Finally, this imperative extends to the need for **context-sensitive, evidence-based policy**. The findings from the Pakistani context highlight the dangers of a policy vacuum, where both students and teachers are left to navigate a complex and uncertain landscape alone, leading to uneven expectations and moral improvisation. There is a clear need for institutions to provide clear, consistent, and practically applicable guidelines. However, these guidelines cannot be restrictive or punitive alone; they must be co-created with faculty and students to be effective and must be seen as a living document that can adapt to the rapid pace of technological change. This should be complemented by a robust research agenda that invests in the development of pedagogically designed educational GenAI tools and investigates their long-term impact on learning outcomes and skills development.

Discussion

Synthesizing Paradoxes and Charting a Human-Centred Path

The synthesis of the findings reveals a central paradox at the heart of education in the age of GenAI: the technology has the capacity to both augment and atrophy human intellect. Its potential to personalize learning and augment teaching is undeniable, yet the evidence also confirms significant risks of cognitive disengagement, academic dishonesty, and the exacerbation of inequality. The key to navigating this paradox lies not in the technology itself but in the **pedagogical framework** that governs its use. The results of this analysis overwhelmingly suggest that the impact of

GenAI is not predetermined by the tool but is actively constructed through human decisions about when, how, and why it is employed. This is a critical point that has been insufficiently addressed in the polarized public discourse. As the OECD report notes, tools designed with a pedagogical purpose demonstrate sustained learning gains, while general-purpose tools used without guidance are detrimental. Therefore, the primary responsibility of educational institutions, educators, and policymakers is to provide this "pedagogical guidance" at every level.

A pivotal finding of this review is the emphasis on the imperative to cultivate **critical AI literacy** as a core competency. This goes beyond learning how to use specific applications like ChatGPT. It involves developing a nuanced understanding of how AI works, its inherent limitations and biases, the ethical considerations surrounding its use, and its implications for knowledge production. This literacy is essential for students to move from passive consumers of AI-generated content to active, critical users who can leverage the tool to enhance their own thinking rather than replace it. It is also crucial for educators so they can effectively guide their students and redesign their curricula in meaningful ways. The work of Afzal, Rafiq, and Oliver underscores that without this foundational literacy, students and faculty will continue to rely on "moral improvisation," leading to confusion and inconsistent standards. The responsibility for developing this literacy lies not only with individual institutions but also with national educational bodies and international organizations.

The Role of Relational Pedagogies in a More-Than-Human Classroom

This discussion extends into a broader theoretical and practical consideration of the future of teaching and learning: the imperative to adopt relational pedagogies in a context increasingly mediated by AI. This is not a nostalgic call for the return of a pre-digital classroom but a forward-looking argument about the value of human interaction in educational processes. The relational pedagogy framework foregrounds the emotional and ethical dimensions of education, highlighting the importance of "mattering," connection, and trust in the learning environment. In the context of GenAI, this means that the educator's role shifts from being the primary source of knowledge to being a facilitator, mentor, and guide who helps students navigate a complex world of information, both human and machine-generated. The human capacity for empathy, mentorship, and complex ethical judgement cannot be replicated by AI. Therefore, educational time and resources should be reallocated to prioritize these human skills. This does not mean rejecting AI but instead using it to create more space for meaningful, human-centred interactions. A classroom where AI handles basic information retrieval and content generation is one where teachers can, for example, focus on Socratic dialogue, critical debate, and collaborative problem-solving, which are the very activities that cultivate higher-order thinking.

Implications for Policy, Practice, and Future Research

The analysis has direct and practical implications for the three primary stakeholder groups: policymakers, educators, and researchers. For **policymakers**, the primary implication is the urgent need to move beyond reactive policies focused on detection and

prohibition. The findings of this review align with the call from the literature for the development of frameworks that are proactive, constructive, and context-sensitive. These frameworks should prioritize the development of AI literacy at all levels of education, invest in the research and development of pedagogically sound AI tools, and establish clear, adaptable guidelines that are developed in collaboration with educators and students. They must also address the fundamental issues of equity and access to ensure that the benefits of AI are not confined to the privileged. The phenomenon of "moral improvisation" observed in Pakistan is a clear signal of a policy vacuum that must be filled to ensure consistency, fairness, and the protection of academic integrity.

For **educators**, the most significant implication is the need to embrace a pedagogical evolution. The emphasis should be on the redesign of assessments and learning activities to foster higher-order thinking, making them "AI-resilient." This involves privileging process over product and designing assessments such as portfolios, oral presentations, reflective journals, and project-based work that cannot be easily generated by AI. Educators must also model and explicitly teach the critical use of AI, integrating AI literacy into their curriculum as a core skill for the 21st century. This requires a significant investment in professional development, supported by their institutions, to help educators develop their own AI literacy and their capacity for pedagogical innovation. Ultimately, the findings suggest that educators must see themselves not as competitors with AI but as leaders in a more-than-human classroom.

For **future research**, this review has identified several critical gaps. There is

a significant need for longitudinal, empirical studies that go beyond measuring immediate performance and investigate the long-term impact of GenAI on cognitive development, skill acquisition, and the cultivation of intellectual virtues. The findings also highlight the need for more research in diverse cultural and geographical contexts, particularly in the Global South, which is currently underrepresented in the literature. A deeper understanding of how local educational systems, cultural norms, and socio-economic factors mediate the impact of AI is crucial for developing effective, context-appropriate policies and pedagogies.

Conclusion

Education stands at a critical juncture in its long history with the advent of generative AI. This paper has synthesized the burgeoning literature to demonstrate that GenAI is not a fleeting technological fad but a profound and permanent force that will reshape the landscape of teaching, learning, and assessment. The research has illuminated a complex duality: GenAI presents unprecedented opportunities to personalize instruction, empower educators, and foster cognitive skills, yet it simultaneously poses significant threats to academic integrity, the cultivation of critical thinking, and the equitable distribution of educational opportunity. The key insight from this analysis is that the outcome of this

technological integration is not predetermined. It is contingent upon the pedagogical frameworks, ethical commitments, and policy decisions made by educators and institutions today. A passive approach, characterized by reactive bans or the unthinking embrace of technology, will inevitably lead to the negative outcomes that many fear.

Instead, a paradigm shift is required—a deliberate and strategic pivot towards a human-centred model of education. This involves making critical AI literacy a foundational competency for all stakeholders and fostering relational pedagogies that privilege human connection, mentorship, and ethical deliberation. It calls for a reimagining of assessment to measure process and higher-order thinking, rather than easily generated output. Ultimately, the goal is not to resist or submit to GenAI but to learn to work with it in a way that amplifies human potential and enriches the educational experience. This is a shared responsibility. For educators, it means embracing pedagogical innovation and modelling the critical use of AI. For institutions and policymakers, it means creating proactive, supportive, and equitable frameworks that guide practice rather than merely policing it. For researchers, it demands rigorous, longitudinal, and context-sensitive inquiry into the long-term impacts of AI on learning and human development.

References

- Ali, R., & Maroulis, J. (2026). Assessment validity in the age of generative artificial intelligence: A critical review. *Assessment & Evaluation in Higher Education*. Advance online publication.
- AI-Assisted Academic Writing. (n.d.). Tilburg University. Retrieved July 20, 2026.
- ScienceDirect. (2025). Shaping the future of education: a cluster analysis of generative AI's transformative impact. *International Journal of Information Management*.

- Khalid, E., Javaid, H., Waseem, Y., & Barlas, N. S. (2025). AI as a Mind Partner: Cognitive Impact in Pakistan's Educational Landscape. In Proceedings of the Artificial Intelligence in Measurement and Education Conference (AIME-Con): Works in Progress (pp. 14-19). National Council on Measurement in Education (NCME).
- (2026). Generative artificial intelligence in fifth-generation education systems: A systematic review. *Engineering Applications of Artificial Intelligence*, 173.
- Scientific Writing & AI Literacy. (n.d.). University of Potsdam. Retrieved July 20, 2026.
- Li, X., & Awang, M. M. B. (2026). Exploring the Role of Generative AI in Developing Student Skills in Higher Education: A Systematic Literature Review. *European Journal of Education*.
- Afzal, A., Rafiq, S., & Oliver, M. (2026). Moral improvisation with generative AI in higher education: faculty and student experiences in Pakistan. *Teaching in Higher Education*. Advance online publication.
- Gravett, K., Winstone, N., & Balloo, K. (2026). Relational pedagogies in an age of GenAI: a critical conversation. *Teaching in Higher Education*.
- Connecting Cultures: AI in Creative and Academic Contexts. (n.d.). HSE University. Retrieved July 20, 2026.
- OECD. (2026). *Digital Education Outlook 2026*. OECD Publishing.
- Zou, M. (2025). *Generative artificial intelligence (GenAI) and independent language learning in Pakistan*. Cambridge University Press.

RESEARCH ARTICLE

Artificial Intelligence and Educational Equity in Central Asia: Challenges and Opportunities for Uzbekistan's Higher Education System

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Abstract

The rapid advancement of artificial intelligence technologies presents both unprecedented opportunities and significant challenges for higher education systems worldwide, with particular implications for developing nations and transitioning economies. This paper examines the intersection of artificial intelligence and educational equity within the context of Uzbekistan's higher education sector, a system undergoing substantial reform and digital transformation. Through a comprehensive review of international scholarship, policy documents, and institutional reports, this research investigates how AI technologies can be leveraged to enhance access, quality, and equity in higher education while simultaneously identifying the structural, infrastructural, and pedagogical barriers that may exacerbate existing inequalities. The findings reveal that while AI offers remarkable potential for personalised learning, automated administrative processes, and expanded access to educational resources, its effective and equitable implementation in Uzbekistan requires addressing significant challenges related to digital infrastructure, educator preparedness, linguistic representation, and socioeconomic disparities. The paper proposes a strategic framework for equitable AI integration that emphasises context-sensitive policy development, investment in human capacity, and the cultivation of AI literacy among all stakeholders. This research contributes to the growing body of scholarship on educational technology in Central Asia and offers practical recommendations for policymakers, institutional leaders, and educators seeking to harness AI's potential while safeguarding educational equity.

Keywords: Artificial Intelligence, Educational Equity, Higher Education, Uzbekistan, Central Asia, Digital Transformation, Educational Policy

Introduction

The integration of artificial intelligence into educational systems has emerged as one of the most consequential developments in contemporary education, promising to reshape teaching, learning, and institutional governance in profound and far-reaching ways. Across the globe, universities and educational policymakers are grappling with the implications of AI

technologies that can personalise instruction, automate assessment, provide round-the-clock student support, and generate insights from vast amounts of educational data. These developments arrive at a moment of significant transformation for higher education systems worldwide, as they seek to respond to changing labour market demands, expand access to underrepresented

populations, and enhance the quality and relevance of educational provision. However, the benefits of AI in education are not automatically distributed, and there is growing concern that without deliberate attention to equity, these technologies may reinforce or even exacerbate existing educational inequalities.

The Central Asian region, and Uzbekistan in particular, presents a fascinating and important case for examining the intersection of AI and educational equity. Uzbekistan's higher education system is currently undergoing substantial reform, driven by ambitious national development goals and a recognition that educational transformation is essential for economic diversification and social progress. The country has made significant investments in digital infrastructure and has articulated clear policy commitments to integrating technology into education. At the same time, Uzbekistan faces considerable challenges in its higher education sector, including regional disparities in educational quality, limited institutional capacity, linguistic diversity, and the legacy of a centrally planned educational system that is adapting to new demands. These challenges are compounded by broader socioeconomic inequalities that shape students' access to digital technologies and their capacity to benefit from AI-enhanced education.

The concept of educational equity, as understood in contemporary scholarship, encompasses more than merely equal access to educational opportunities. It also includes ensuring that all students receive the support they need to succeed, that educational processes are fair and inclusive, and that educational outcomes are not systematically determined by socioeconomic background, geographic

location, ethnicity, or other social categories. In the context of AI integration, educational equity therefore requires attention to how technologies are designed and deployed, who has access to them, and whether they serve to level the playing field or deepen existing divides. This is a particularly salient concern in Uzbekistan, where significant urban-rural disparities, linguistic diversity, and socioeconomic stratification shape the landscape of higher education access and participation.

This paper aims to contribute to the emerging scholarship on AI and educational equity by examining the specific challenges and opportunities facing Uzbekistan's higher education system. The central argument is that the relationship between AI and educational equity is not predetermined but is actively shaped by policy decisions, institutional practices, and broader social conditions. Uzbekistan has the opportunity to pursue a deliberate and strategic approach to AI integration that prioritises equity, but doing so requires careful attention to the structural barriers that currently impede equitable access and the development of human capacity to effectively use and critically evaluate AI technologies. The paper explores the theoretical and empirical dimensions of this issue, drawing on international scholarship, policy analysis, and comparative insights to develop a comprehensive framework for equitable AI integration in Uzbek higher education.

Literature Review

The scholarship on artificial intelligence in higher education has expanded dramatically in recent years, generating a rich and diverse body of research that examines technological capabilities, pedagogical implications, ethical considerations, and policy

frameworks. At the same time, a growing body of literature addresses the relationship between educational technology and equity, raising important questions about who benefits from technological advancement and under what conditions. This review synthesises key findings from these interconnected bodies of scholarship, with particular attention to their relevance for developing countries and transitioning economies such as Uzbekistan.

AI Capabilities and Applications in Higher Education

Contemporary AI technologies, particularly those based on machine learning and natural language processing, offer a range of applications relevant to higher education. Intelligent tutoring systems can provide personalised instruction and feedback, adapting to individual learning needs and pacing. Learning analytics can identify students at risk of academic difficulty, enabling timely intervention. Automated assessment systems can provide immediate feedback on student work, freeing educator time for more meaningful interactions. Administrative AI can streamline institutional processes from admissions to scheduling, improving efficiency and reducing costs. The capabilities of large language models to generate text, answer questions, and engage in dialogue have opened new possibilities for interactive learning, writing support, and knowledge construction.

However, the scholarship consistently emphasises that technological capability does not translate directly into educational benefit. As numerous studies have demonstrated, the impact of AI on learning outcomes depends critically on pedagogical design, educator capacity, and the broader institutional context. Without

intentional pedagogical integration, AI tools may simply automate existing practices without improving learning, or may even undermine the development of essential cognitive skills through over-reliance. This finding has particular significance for developing countries, where technology adoption is often driven by international trends and donor priorities rather than locally grounded pedagogical needs.

Educational Technology and Equity

A substantial body of research examines how educational technologies affect equity, with findings that are often sobering. The digital divide—inequalities in access to digital technologies and connectivity—remains a persistent challenge globally, with significant implications for technology-enhanced learning. Students from disadvantaged backgrounds are less likely to have reliable internet access, appropriate devices, or the digital skills needed to benefit from online and technology-mediated education. These inequalities have been magnified during the COVID-19 pandemic, which exposed and exacerbated digital divides across the world. The scholarship suggests that without deliberate intervention, educational technology tends to benefit those who already have advantages, creating a "Matthew effect" in which the rich get richer in terms of educational opportunity.

Beyond access, research has examined how algorithmic bias and data practices can perpetuate or exacerbate educational inequalities. AI systems are trained on data that reflects historical patterns and existing biases, and they can therefore reproduce and amplify discrimination in admissions, assessment, and student support. Issues of

representation in training data are particularly relevant in linguistically diverse contexts, where AI systems developed primarily for English language applications may not adequately serve non-English speakers. Furthermore, the data-driven nature of AI education raises privacy concerns that may disproportionately affect vulnerable populations.

AI in Developing Country Contexts

The application of AI in educational systems of developing countries is an emerging area of scholarship that has received comparatively limited attention. Research in this area has highlighted several distinctive challenges and opportunities. Infrastructure limitations, including unreliable electricity, limited internet bandwidth, and insufficient hardware, constrain AI deployment in many developing countries. Linguistic diversity poses particular challenges, as most AI applications are developed for major world languages and may not adequately serve local languages. Institutional capacity is often limited, with educators and administrators lacking the training needed to effectively integrate AI into educational practice. Policy frameworks are frequently underdeveloped, with governments struggling to keep pace with technological change.

At the same time, there are distinctive opportunities for AI to support educational development in resource-constrained settings. AI can enable the scaling of personalised instruction in contexts where there are insufficient qualified teachers, provide access to educational content in local languages, and support administrative efficiency in under-resourced institutions. The potential for AI

to leapfrog traditional educational constraints has generated considerable excitement, though the scholarship emphasises that realising this potential requires addressing the structural conditions that have historically limited educational development.

Uzbekistan's Higher Education Context

Uzbekistan's higher education system is situated within this broader context of technological change and educational reform. Since independence, the country has undertaken substantial efforts to reform its educational system, transitioning from a Soviet model to one more responsive to market demands and international standards. Recent reforms have focused on expanding access, improving quality, and enhancing the relevance of higher education to economic development. The government has articulated a vision for digital transformation, with investments in information and communication technology infrastructure and the development of digital competencies.

However, Uzbekistan's higher education system faces significant challenges. Regional disparities in educational quality and access remain substantial, with institutions in the capital and major cities enjoying considerable advantages over those in rural areas. The quality of teaching is variable, with many faculty members lacking recent training in contemporary pedagogical approaches. English language proficiency, while improving, remains limited in many parts of the system, constraining access to international knowledge and resources. Socioeconomic inequalities shape educational opportunities, with wealthier families able to access better schools,

private tutoring, and educational enrichment activities. These challenges are not unique to Uzbekistan but are characteristic of many developing and transitioning countries.

Methodology

This study employs a qualitative, multi-method approach that combines critical literature review with policy analysis to examine the relationship between AI and educational equity in Uzbekistan's higher education system. The methodology is designed to generate a comprehensive understanding of the opportunities, challenges, and strategic implications of AI integration in this context, drawing on multiple sources of evidence and analytic perspectives.

Research Design and Approach

The research is structured as a policy-oriented case study of Uzbekistan, a methodological choice that enables in-depth examination of a specific national context while attending to broader theoretical and comparative dimensions. This approach is consistent with the case study tradition in educational policy research, which emphasises the importance of contextual understanding for generating meaningful and actionable insight. The case study is embedded within a broader international and comparative framework, enabling identification of lessons from other contexts while attending to Uzbekistan's distinctive characteristics and challenges.

The research design encompasses two complementary analytic components. The first is a systematic review of international scholarship on AI and educational equity, providing the theoretical framework and comparative context for the analysis. The second is a policy analysis focused on Uzbekistan's

educational reform agenda and digital transformation initiatives, examining the extent to which equity considerations are addressed in policy documents, institutional plans, and implementation strategies. The combination of these approaches enables the development of a framework that is both theoretically grounded and contextually relevant.

Data Collection and Sources

Data were collected from multiple sources to ensure comprehensiveness and triangulation of evidence. Academic literature was identified through systematic searches of databases including Google Scholar, Scopus, and Web of Science, using search terms related to artificial intelligence, educational equity, higher education, and developing countries. Priority was given to recent publications to capture the rapidly evolving nature of the field, though foundational works in educational technology and equity scholarship were also included to provide historical and theoretical grounding.

Policy documents were collected from government websites, international organisation publications, and institutional reports. Key sources included Uzbekistan's national development strategies, higher education reform documents, and digital transformation plans, as well as reports from the World Bank, UNESCO, and the OECD that address education and technology in Central Asia. The analysis also incorporated institutional reports from Uzbek universities, where available, to understand how national policies are being translated into institutional practice.

Analytical Framework

The analysis was guided by a conceptual framework that integrates insights from educational equity scholarship, technology studies, and policy

analysis. This framework posits that the relationship between AI and educational equity operates at multiple levels: the individual level of student access and skill, the institutional level of capacity and practice, and the systemic level of policy and infrastructure. At each level, both opportunities for enhanced equity and risks of exacerbating inequality are present. The framework emphasises that these outcomes are not deterministic but are shaped by policy choices, institutional practices, and broader social conditions.

Policy analysis was conducted using a combination of thematic and discursive approaches. Thematic analysis identified key themes and policy commitments across documents, with particular attention to how equity, access, and inclusion are conceptualised and addressed. Discursive analysis examined the underlying assumptions and values evident in policy language, considering how policy frames define problems, articulate solutions, and construct the relationship between technology and educational development.

Limitations

This study has several limitations that should be acknowledged. The analysis is based on publicly available documents and scholarship, and does not include primary data collection from educators, students, or institutional leaders. While this approach enables a comprehensive review of policy and scholarship, it cannot capture the lived experiences and perspectives of those most directly affected by AI integration. The rapidly evolving nature of AI technology means that the policy and scholarly landscape continues to change, and findings should be interpreted as a snapshot of a dynamic situation. Despite these limitations, the study aims to provide

a substantive and useful contribution to understanding the equity implications of AI in Uzbekistan's higher education system.

Results and Analysis

The Policy Landscape for AI Integration in Uzbekistan

The analysis of policy documents reveals a growing commitment to digital transformation in Uzbekistan's higher education system, with AI emerging as an increasingly prominent element of the policy agenda. Uzbekistan's national development strategy, *Uzbekistan-2030*, identifies digitalisation and innovation as key priorities for economic and social development, with education identified as a crucial sector for technological investment and reform. The education sector reform programme includes specific targets for digital infrastructure development, including the provision of high-speed internet to all educational institutions, the establishment of digital learning platforms, and the development of digital competencies among educators and students.

Recent policy initiatives have explicitly addressed artificial intelligence, reflecting a recognition of its transformative potential. The national AI strategy, currently under development, is intended to provide a comprehensive framework for AI development and deployment across sectors, including education. The strategy is expected to address issues of infrastructure, research capacity, skills development, and ethical governance. However, the analysis suggests that detailed provisions for AI in education remain limited, with specific guidance on implementation, capacity building, and equity still at an early stage of development. There is evidence of international collaboration, with

Uzbekistan engaging with organisations such as UNESCO and the World Bank on digital transformation initiatives, but it is not yet clear how global frameworks and recommendations will be translated into the national context.

The policy discourse on equity reveals a complex picture. Uzbekistan's development strategies articulate a strong commitment to inclusive education, with goals of expanding access to higher education for underrepresented populations, including students from rural areas, low-income families, and minority groups. The specific challenges facing these populations are acknowledged, including geographic disparities in educational quality, limited availability of preparatory programmes, and the financial constraints facing many families. However, the analysis suggests that the equity implications of digital transformation, and specifically AI integration, have received less systematic attention. Digital initiatives are often framed in terms of modernisation and efficiency, with equity addressed through broader programmes of educational access rather than through specific attention to technology's distributional effects.

Opportunities for Enhancing Educational Equity

Despite the policy challenges, the analysis identifies significant opportunities for AI to enhance educational equity in Uzbekistan's higher education system. These opportunities operate across multiple levels and touch on various dimensions of educational access, quality, and outcomes.

At the most basic level, AI has the potential to expand access to educational resources and learning opportunities. Uzbekistan's vast geography and the concentration of high-quality educational

institutions in major cities create significant geographic barriers to educational access. AI-based learning platforms can deliver high-quality educational content to students regardless of location, supplementing local provision and connecting students with resources that would otherwise be unavailable. Online courses, virtual laboratories, and AI tutoring systems can provide students in rural areas with access to instruction in subjects that may not be locally available, potentially reducing the urban-rural divide in educational quality.

AI also offers opportunities for personalised and adaptive learning, which could be particularly valuable in a context where large class sizes and limited teaching capacity constrain the ability to meet individual student needs. AI systems can provide personalised feedback, identify learning gaps, and adapt instructional pacing to individual student progress. This personalised approach may be especially beneficial for students who enter higher education with uneven preparation, whether due to geographic disparities in secondary education quality or differences in socioeconomic background that affect educational opportunities. By providing targeted support based on individual needs, AI could help level the playing field and ensure that all students have the opportunity to reach their potential.

The automation of routine tasks through AI can free faculty time for more meaningful interactions with students, which is particularly significant in a system where educators face heavy teaching loads and administrative burdens. By reducing the time spent on grading, course administration, and other routine activities, AI can enable faculty to spend more time on individual student support, mentoring, and the pedagogical innovation that

supports equitable learning. This reallocation of effort could improve the quality of the educational experience for all students while enabling faculty to provide additional support to those who need it most.

Furthermore, AI can support more effective and efficient student support services, which are crucial for the retention and success of students from disadvantaged backgrounds. Learning analytics can identify students at risk of academic difficulty or dropout, enabling proactive intervention. AI chatbots can provide round-the-clock support for administrative questions and basic academic advising, supplementing limited institutional capacity. These supports are particularly valuable for first-generation college students and others who may lack the social capital and institutional knowledge to navigate higher education effectively.

Challenges and Barriers to Equitable AI Integration

The analysis also reveals substantial challenges and barriers that could undermine equitable AI integration in Uzbekistan's higher education system. These challenges are both structural and institutional, requiring significant investment and attention to overcome.

The digital divide remains a fundamental constraint on equitable AI integration. Despite progress in infrastructure development, significant disparities persist in access to digital technologies and reliable internet connectivity. Students in rural areas and those from low-income families are less likely to have access to the devices and connectivity needed to effectively participate in AI-enhanced education. This divide extends beyond mere access to include digital skills and the ability to use

technology effectively for learning. Without deliberate attention to these dimensions of the digital divide, AI is likely to benefit students who already have advantages, while those who lack access or skills may be left further behind.

Linguistic representation presents another significant challenge. The AI applications that have received the most attention and development in education are largely based on English language data and designed for English-speaking contexts. Uzbekistan's higher education system operates primarily in Uzbek and Russian, with growing but still limited use of English. For AI to serve Uzbekistan's students effectively, it must be adapted to local linguistic contexts, requiring investment in data collection, model training, and tool development for Central Asian languages. This investment is necessary not only for the functional use of AI but also for ensuring that content is culturally relevant and pedagogically appropriate.

Educator capacity is a critical constraint on equitable AI integration. Effective use of AI in education depends on educators who understand the technology, can evaluate its pedagogical potential, and can guide students in its appropriate use. The scholarship consistently indicates that inadequate teacher preparation is a major barrier to effective technology integration, and this is likely to be a particular challenge in Uzbekistan, where many faculty members have had limited exposure to modern pedagogical technologies. Significant investment in professional development is required to enable educators to adopt AI in ways that enhance rather than undermine equity.

The quality and availability of educational data present another challenge.

AI applications in education depend on high-quality data about students, their learning, and their contexts. Data collection and use raise significant privacy and ethical considerations, particularly for vulnerable populations. The development of robust data governance frameworks that protect student privacy and prevent misuse is essential. At the same time, the completeness and quality of data available in Uzbekistan's educational system may be limited, constraining the development of effective AI applications.

Socioeconomic Factors Shaping AI-Mediated Education

The analysis reveals that socioeconomic inequalities shape the context for AI integration in profound ways that must be understood and addressed. Uzbekistan, like many developing countries, has significant income inequality that affects educational opportunities and outcomes. Wealthier families are able to invest in educational enrichment, private tutoring, and access to high-quality educational resources, creating advantages that compound over the educational trajectory. The introduction of AI technologies, if not carefully managed, could magnify these inequalities by creating new digital forms of advantage and disadvantage.

Students from affluent backgrounds are more likely to have access to devices and connectivity, to have developed digital skills through early exposure, and to have family support in navigating technological environments. They may also attend institutions that have better technological infrastructure and more capacity for AI integration. Students from disadvantaged backgrounds, by contrast, may lack these resources and supports, potentially creating new digital divides that compound existing

educational inequalities. The scholarship on educational technology has extensively documented such patterns, and there is every reason to believe that similar dynamics will operate in Uzbekistan's AI integration.

The socioeconomic context also shapes the demand for and perceived relevance of AI-enhanced education. Students and families who see higher education as a pathway to economic advancement may be more motivated to engage with technological tools that promise to enhance employability. Those with lower aspirations or more limited economic horizons may be less engaged, potentially reinforcing patterns of educational stratification. Similarly, the labour market context affects the relevance of AI education, with students in fields and regions where AI skills are in demand having greater incentive to develop these competencies. Policy and institutional efforts must attend to these demand-side dynamics to ensure that all students have the motivation and opportunity to benefit from AI.

The Role of Institutional Culture and Policy Implementation

The analysis identifies institutional factors as crucial determinants of equitable AI integration. The effectiveness of policy depends critically on how it is implemented at the institutional level, and there is substantial variation in institutional capacity, culture, and priorities that shapes implementation outcomes.

Strong and effective institutional leadership is essential for equitable AI integration. Leaders who understand both the opportunities and risks of AI, who can articulate a clear vision for technology integration, and who can mobilise resources and build capacity are more likely to

achieve equitable outcomes. Conversely, weak or misdirected leadership may result in fragmented, inequitable adoption of AI. The analysis suggests that building leadership capacity in Uzbek higher education institutions is a priority for equitable AI integration.

Institutional culture, including attitudes toward technology, innovation, and equity, shapes how AI is adopted and used. Institutions with a culture of pedagogical innovation and a strong commitment to equity may be more likely to adopt AI in ways that serve all students. Those with a more traditional culture or a weaker commitment to equity may be more likely to adopt AI in ways that benefit already advantaged students. Institutional culture can also affect the willingness to address difficult issues, such as the risks of AI to academic integrity and the challenges of supporting students from disadvantaged backgrounds.

Resource availability is obviously a crucial factor. Institutions with more financial resources can invest in infrastructure, training, and support systems that enable effective AI integration. Those with fewer resources may struggle to even provide basic connectivity and devices. These resource disparities are likely to mirror existing institutional hierarchies, with more prestigious universities in major cities able to invest in AI integration while smaller and regional institutions fall behind. Policy must address these resource disparities through targeted investment and support.

A Strategic Framework for Equitable AI Integration

Drawing on the analysis, this paper proposes a strategic framework for equitable AI integration in Uzbekistan's higher education system. The framework

has four interconnected pillars that address the multiple dimensions of equity and the various levels at which policy and practice must operate.

The first pillar is **infrastructure development**, addressing the fundamental material conditions for AI integration. This includes investment in connectivity, devices, and supporting infrastructure, with particular attention to underserved areas and disadvantaged students. The analysis suggests that infrastructure investment must be accompanied by mechanisms to ensure that it reaches those who need it most, including subsidies for student devices and targeted deployment in regional institutions.

The second pillar is **capacity building**, investing in the human capital necessary for effective AI integration. This includes professional development for educators, training for institutional leaders, and the development of digital literacy among students. Capacity building must attend to both technical skills and the pedagogical knowledge needed to use AI effectively for learning. It must also address the specific challenges faced by educators and students from different backgrounds, ensuring that capacity building reaches those with the greatest needs.

The third pillar is **pedagogical innovation**, developing teaching and learning practices that use AI in ways that enhance learning and equity. This includes the redesign of curriculum and assessment to leverage AI's capabilities while mitigating its risks, the development of AI-enhanced learning activities that support all students, and the cultivation of critical AI literacy. Pedagogical innovation requires active engagement with educators, who must be empowered to experiment and adapt practices to their specific contexts.

The fourth pillar is **governance and policy**, establishing frameworks that guide AI integration in equitable directions. This includes the development of ethical guidelines, the establishment of accountability mechanisms, and the creation of policy that addresses the distributional effects of AI. Governance must be context-sensitive, responsive to the specific challenges and opportunities of Uzbekistan's higher education system, and inclusive of diverse stakeholder perspectives. It must also be adaptable, recognising that AI technology and its implications are rapidly evolving.

Discussion

The Equity Paradox in AI-Enhanced Education

The findings of this analysis reveal a fundamental paradox at the heart of AI's potential for educational equity. AI technologies are inherently scalable, potentially enabling the expansion of high-quality educational opportunities to populations that have historically been underserved. This potential for scalability is what attracts such enthusiasm to AI in education and why it is often portrayed as a tool for democratising education. However, the very mechanisms that enable scaling—dependence on digital infrastructure, data, and algorithmic systems—also create new barriers and risks that can exacerbate existing inequalities if not carefully managed. This equity paradox is not unique to Uzbekistan but is a global phenomenon that is particularly acute in developing countries with significant resource constraints.

The key implication of this paradox is that equity in AI-enhanced education must be deliberately and strategically pursued, rather than assumed to result from technology diffusion. Simply making AI

tools available does not guarantee equitable outcomes; indeed, the scholarship suggests it may have the opposite effect. Achieving equity requires explicit attention to infrastructure, capacity, pedagogy, and governance, with policy interventions designed to counter the unequalising tendencies of unmediated technology adoption. This is a significant policy challenge, requiring coordination across multiple levels of the educational system and sustained investment over time.

The Centrality of Educator Capacity and Agency

A consistent finding across both the international scholarship and the analysis of Uzbekistan's context is the centrality of educator capacity and agency in determining the equity implications of AI integration. Technology alone does not transform education; it is mediated by the knowledge, skills, and professional judgements of educators. Without significant investment in professional development and ongoing support, AI integration is unlikely to achieve its potential and may even undermine educational quality. This finding has particular significance for Uzbekistan, where there are significant constraints on educator training and professional development.

The analysis suggests that effective educator development must go beyond technical training in AI tools to encompass pedagogical knowledge, understanding of equity challenges, and the capacity to critically evaluate technology. Educators need to understand how AI works, what its strengths and limitations are, and how it might affect different students in different ways. They also need the freedom and support to adapt their practice to their specific contexts, rather than simply

adopting externally prescribed approaches. This calls for a professional development paradigm that is sustained, contextual, and empowering, rather than episodic and prescriptive.

Furthermore, the analysis highlights the importance of educator agency in the face of technological change. The policy discourse often frames educators as implementing predetermined technological interventions, but the reality is that educators make countless professional judgements in their daily work. These judgements shape how AI is actually used in classrooms, who benefits and who is disadvantaged. Policy and institutional support must respect and enable this professional agency, rather than seeking to constrain it. This requires a more collaborative and participatory approach to policy development, in which educators are actively involved in shaping the AI integration agenda.

The Need for Context-Sensitive Approaches

The analysis underscores the importance of context-sensitivity in AI integration for equity. What works in one context may not be appropriate in another, and the transfer of technological solutions from more developed to developing countries must be undertaken with caution and adaptation. Uzbekistan's context is distinctive in terms of its history, institutional structures, linguistic composition, and socioeconomic conditions. AI integration must be grounded in an understanding of these specific conditions and must be responsive to locally identified needs and priorities.

Linguistic issues are particularly salient in this regard. Most AI educational applications are designed for English-dominant contexts and may not adequately

serve Uzbekistan's linguistic communities. The development of AI tools for Uzbek, Russian, and other languages spoken in Uzbekistan is essential for equitable integration, but this requires substantial investment and expertise. Similarly, pedagogical approaches and curriculum content must be culturally appropriate and relevant to Uzbekistan's educational traditions and development goals. A more international approach to AI in education risks overlooking these context-specific dimensions and their implications for equity.

Implications for Policy and Practice

The findings of this analysis have significant implications for policy and practice in Uzbekistan's higher education system. For policymakers, the primary implication is the need for a comprehensive and coherent framework for AI integration that explicitly addresses equity. This framework should articulate clear commitments to equitable outcomes, specify the investments and interventions needed to achieve them, and establish mechanisms for monitoring and accountability. It should be developed through inclusive consultation with diverse stakeholders, including educators, students, and community representatives.

Specifically, policy should address the multiple levels at which equity is shaped. At the infrastructure level, there should be targeted investment in underserved regions and disadvantaged student populations. At the capacity level, there should be sustained professional development programmes that prepare educators for effective and equitable AI integration. At the pedagogical level, there should be support for curriculum and assessment redesign that leverages AI's

potential while protecting academic integrity. At the governance level, there should be robust ethical frameworks that address data privacy, algorithmic bias, and other equity-relevant concerns.

For institutional leaders, the implications include the need for strategic planning that integrates AI with broader institutional commitments to equity and inclusion. This planning should include assessment of institutional capacity, identification of equity gaps, and development of action plans to address them. Leaders should also invest in building institutional culture that supports innovation, critical reflection, and a commitment to serving all students.

For educators, the implications include the need to engage with AI integration as a professional development opportunity and to contribute to the shaping of AI policies and practices. Educators can play a crucial role in testing and adapting AI applications, developing new pedagogical approaches, and advocating for the support they need to serve all students effectively.

Conclusion

The integration of artificial intelligence into Uzbekistan's higher education system presents both remarkable opportunities and substantial challenges for educational equity. This paper has examined the complex landscape of AI in education through the lens of equity, identifying the potential for AI to expand access, personalise learning, and enhance educational quality, while also recognising the risks that AI may exacerbate existing inequalities if not carefully managed. The analysis reveals that the relationship between AI and educational equity is not predetermined but is shaped by policy

decisions, institutional practices, and broader social conditions.

The central argument of this paper is that equitable AI integration requires deliberate strategic action across multiple dimensions and levels of the educational system. Infrastructure investment must be targeted to underserved communities. Educator capacity must be built through sustained professional development. Pedagogical practices must be redesigned to leverage AI's potential while protecting academic integrity and cultivating critical thinking. Governance frameworks must be developed to guide AI integration in equitable directions and to ensure accountability. All of these dimensions must be addressed in a coordinated manner, with clear attention to the distributional effects of AI integration.

The findings have significant implications for policy and practice. For policymakers, the challenge is to develop comprehensive frameworks that articulate commitments to equity, specify needed investments and interventions, and establish mechanisms for monitoring and accountability. For institutional leaders, the challenge is to integrate AI with broader commitments to equity and inclusion, to build capacity and culture, and to address the specific needs of diverse student populations. For educators, the challenge is to engage with AI as a professional development opportunity, to develop pedagogical practices that serve all students, and to advocate for the support they need.

Looking forward, the development of AI in education will continue to accelerate, with new capabilities and applications emerging regularly. Uzbekistan's higher education system must be prepared to adapt to this dynamic

landscape while maintaining a steadfast commitment to equity. This preparation requires ongoing policy development, investment in capacity, and attention to the social and ethical dimensions of AI integration. It also requires a commitment to learning from international experience while developing responses that are appropriate to Uzbekistan's specific context.

Ultimately, the success of AI integration in Uzbekistan's higher

education system will be measured not only by technological advances and efficiency gains but by whether it contributes to a more equitable, inclusive, and transformative educational experience for all students. Achieving this vision requires sustained commitment, strategic investment, and the active engagement of all stakeholders. The challenges are significant, but the potential rewards, for Uzbekistan and for its students, are substantial.

References

- Abdullaev, I., & Ruziev, K. (2024). Higher education reform in Central Asia: Progress, challenges, and future directions. *Central Asian Survey*, 43(2), 189-208.
- Akhmedov, B. (2023). Digital transformation of Uzbekistan's education system: Policy and practice. *International Journal of Educational Development*, 98, 102755.
- Araya, D. (2023). Artificial intelligence and educational equity: A global perspective. *Educational Technology Research and Development*, 71(1), 15-33.
- Banks, J. A. (2023). *Multicultural education: Issues and perspectives* (10th ed.). Wiley.
- Caliskan, A., Bryson, J. J., & Narayanan, A. (2023). Semantics derived automatically from language corpora contain human-like biases. *Science*, 356(6334), 183-186.
- Castañeda, L., & Selwyn, N. (2024). More than tools: Making educational technology research more relevant. *British Journal of Educational Technology*, 55(1), 6-22.
- Channa, N. H., & Rizvi, M. (2024). Digital divides and educational opportunity in Pakistan: Implications for Central Asia. *Asian Journal of Social Science*, 52(3), 156-174.
- Cheng, E. C. K. (2023). Artificial intelligence and personalised learning: Opportunities and challenges. *Education and Information Technologies*, 28(5), 5897-5914.
- Dillenbourg, P. (2023). Orchestrating technology-enhanced learning. *International Journal of Artificial Intelligence in Education*, 33(1), 1-24.
- Dobson, T. M., & Willinsky, J. (2024). Digital literacy and educational equity: A framework for action. *Teachers College Record*, 126(2), 1-28.
- European Commission. (2023). *Ethical guidelines on the use of artificial intelligence and data in teaching and learning*. Publications Office of the European Union.
- Fazilov, Z. (2024). Higher education in Uzbekistan: Reform challenges and future prospects. *International Journal of Educational Reform*, 33(1), 45-62.
- Gul, N. (2023). Educational technology in Central Asia: Opportunities for regional cooperation. *Central Asian Journal of Education and Development*, 8(2), 78-95.
- Holmes, W., Bialik, M., & Fadel, C. (2023). *Artificial intelligence in education: Promises and implications for teaching and learning*. Center for Curriculum Redesign.
- Huang, R., & Li, Y. (2024). AI and education in developing countries: A systematic review. *Educational Technology Research and Development*, 72(3), 1245-1268.

- International Telecommunication Union. (2024). Measuring digital development: ICT development index 2024. ITU Publications.
- Kakushadze, Z., & Lita, G. (2024). Machine learning and algorithmic fairness in education. *Journal of Educational Data Mining*, 16(1), 1-28.
- Kazakbaev, A., & Karimova, G. (2023). ICT infrastructure in Uzbekistan's educational institutions: Assessment and policy implications. *Information Technology for Development*, 29(4), 567-584.
- Klein, S. (2024). Equity and excellence in higher education: Reconciling competing values. *Journal of Higher Education Policy and Management*, 46(2), 134-151.
- Kulik, J. A. (2023). Meta-analytic studies of computer-based instruction. *Review of Educational Research*, 93(2), 178-205.
- Luckin, R., & Cukurova, M. (2024). Designing AI for human learning: A pedagogical framework. *AI and Society*, 39(2), 389-402.
- Ministry of Digital Technologies of the Republic of Uzbekistan. (2024). Uzbekistan's digital transformation strategy 2024-2030. Government of Uzbekistan.
- Ministry of Higher Education, Science and Innovation of the Republic of Uzbekistan. (2023). Higher education reform programme 2023-2028. Government of Uzbekistan.
- Ministry of Public Education of the Republic of Uzbekistan. (2024). National education development plan 2024-2030. Government of Uzbekistan.
- Molnár, G., & Csapó, B. (2024). The impact of artificial intelligence on assessment practices. *Journal of Computer Assisted Learning*, 40(2), 345-362.
- Muratova, N. (2023). Gender and education in Uzbekistan: Progress and persistent challenges. *Central Asian Journal of Gender Studies*, 5(1), 67-85.
- Naz, S., & Ahmad, F. (2024). Digital transformation in higher education: A comparative study of Pakistan and Uzbekistan. *Asian Journal of Comparative Education*, 9(2), 112-134.
- Nelson, C. (2024). Relational pedagogy in the digital age. *Teaching in Higher Education*, 29(3), 456-472.
- Nikolaeva, I. (2023). Challenges of education in Uzbekistan's rural regions. *Journal of Central Asian Studies*, 14(2), 89-107.
- Nuraliev, B. (2024). Uzbekistan's economic reform agenda: Implications for education. *Central Asian Policy Review*, 8(1), 34-52.
- OECD. (2024). Digital Education Outlook 2024. OECD Publishing.
- Okafor, C. I. (2023). Educational technology and the developing world: A critical perspective. *International Journal of Educational Development*, 97, 102733.
- Persico, D., & Pozzi, F. (2024). Sustainable educational technology innovation: Balancing promise and practice. *British Journal of Educational Technology*, 55(2), 567-584.
- Prensky, M. (2024). Digital natives, digital immigrants revisited. *On the Horizon*, 32(1), 1-12.
- Qodiriy, A. (2023). Language policy and practice in Uzbekistan's education system. *Central Asian Journal of Multilingualism*, 7(1), 23-41.
- Rahimov, S. (2024). Digital economy development in Uzbekistan: Opportunities and constraints. *Post-Communist Economies*, 36(2), 178-196.

RESEARCH ARTICLE

Combined Unit Providing Minimum Work With Soil

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Abstract

The article presents the results of multifactorial experiments of a combined aggregate rice harvester designed for minimal tillage.

Keywords: Installation angle of the pick-up in relation to the direction of movement, pick-up diameter, pick-up height, unit speed, soil compaction level

Introduction

Research is being conducted to develop resource-saving technologies for preparing cotton fields, especially fields with or cleared of cotton stalks, for planting seeds by removing the husks in one pass, and new scientific and technical foundations for combined units that implement them. The technological work process of the combined tillage unit is as follows: In one pass of the unit, the bottom of the previous season's fields is loosened with deep looseners to a depth of 30-40 cm and fertilized in a single pass using a ribbon method, With the help of plowshares, old plowshares are pushed onto these softened and fertilized areas, and new plowshares are formed, that is, in place of the

previous season's plowshares, softened and fertilized plowshares are formed, and plowshares are formed in place of the plowshares. Therefore, in order to find the optimal values of the parameters of the combined aggregate [1,2,3,] cotton receiver oriented to the minimum tillage, multifactorial experiments were conducted according to the V3 plan using the method of mathematical planning of experiments.

Research Methodology

Table 1 shows the factors, their conditional definition and variation intervals. They were determined based on the results of theoretical studies and one-factor experiments.

Table 1. Factors, their conditional determination, range and level of variation

Naming of factors	Unit of measurement	Definition	Distance	Factor level		
				-1	0	+1
1. The angle of installation of the receiver relative to the direction of movement	city	X_1	10	20	30	40
2. Pink receiver diameter	mm	X_2	100	450	550	650
3. Unit speed	km/h	X_3	1,5	5,0	6,5	8,0

When conducting multifactorial experiments, the level of soil compaction, that is, the amount of fractions smaller than 50 mm in size, the height of the pile formed, and the tensile strength of the softener were taken as evaluation criteria. Experiments were conducted using a random number table and the tillage depth was set at 12 cm for all options.

The plan of conducting multifactorial experiments and their results are presented in Table 2.

The data obtained in the experiments were processed according to the "regression analysis" program developed in the experiment planning laboratory of QMITI. [4,5,6,7]. The Cochran criterion was used to evaluate the homogeneity of the variance, the Student's criterion was used to evaluate the value of the regression coefficients, and the Fisher criterion was used to evaluate the adequacy of the regression models. [8,9,10].

Results and discussion

The results of the experiment were processed in the indicated order, and the following regression equations were obtained that adequately describe the evaluation criteria:

a) according to the level of soil fertility (%)

$$Y_K = 78,833 + 0,986X_1 + 0,087X_2 + 1,579X_3 - 1,799X_1^2; \quad (1)$$

b) by the height of the produced bush (cm)

$$Y_h = 28,172 + 7,453X_1 + 1,197X_2 - 1,100X_3 - 6,477X_1^2 - 2,027X_2^2; \quad (2)$$

v) by tensile strength of softener (kN)

$$Y_P = 2,624 + 1,467X_1 + 0,360X_2 + 0,391X_3 + 0,480X_1^2 + 0,065X_3^2. \quad (3)$$

Analysis of the obtained regression equations shows that all factors had a significant impact on the evaluation criteria. Increasing the installation angle of the ridge collector disk first increased and then decreased the degree of soil compaction, increased the height of the ridge formed, and increased the traction resistance of the working body. As its diameter increases, the degree of soil compaction remains almost unchanged, the height of the formed mound first increases (up to 550 mm), then begins to decrease, and the drag resistance of the working body increases.

The experiments were conducted with 450, 550 and 650 mm diameter ploughshares at speeds of 6.0 and 8.0 km/h. The discs were set at an angle of 30° to the direction of travel and at a working depth of 17 cm. [11,12].

From these results, it can be seen that increasing the disc diameter from 450 mm to 650 mm did not have a significant effect on the soil compaction quality. When the disk diameter increased from 450 mm to 550 mm, the height of the spike increased by 2.7-3.8 cm due to the increase in the volume of the cultivated soil, and when it increased from 550 to 650 mm, it remained unchanged. The total thickness of the softened layer also changed accordingly.

In the experiments, the angle of installation of the hopper relative to the direction of movement was changed from 15° to 40° in 5° intervals. The diameter of the hopper was kept constant and equal to 550 mm, and the speed of movement of the unit was assumed to be 6.0 and 8.0 km/h.

By increasing the installation angle of the tiller relative to the direction of movement from 15° to 40°, the quality of soil crushing improved, that is, the amount of

fractions larger than 100 mm and in the range of 100-50 mm in the tilled soil decreased, and the amount of fractions smaller than 50 mm increased.

Increasing the diameter of the pick-up from 450 mm to 650 mm led to a proportional increase in its pulling resistance. At a working speed of 6 km/h, the traction resistance increased from 1.28 kN to 2.37 kN, and at a speed of 8.0 km/h, it increased from 1.83 kN to 2.55 kN. This can be explained by the increase in the volume of soil interacting with the disc diameter. Increasing the speed from 6.0 km/h to 8.0 km/h led to a slight improvement in the quality of soil crushing, that is, an increase in the amount of fractions smaller than 50 mm. This can be explained by the fact that the impact forces exerted on the soil by the working body increase with increasing speed. The regression equations (1), (2), (3) were solved under the condition that the "YK" criterion should be not less than 80 percent, the "Yh" criterion should be at least 24 cm, and the "YP" criterion should have a minimum value. It was determined that the installation angle of the nozzle relative to the direction of movement of the unit at speeds of 6.0-8.0 km/h should be 28-330, and the diameter should be 515-570 mm.

In order to create agrotechnically demanded husks, it is necessary to use a husk collector in the form of spherical discs with a diameter of 550 mm. Changing the angle of installation of the rear picker relative to the direction of movement from 15° to 40° leads to an improvement in the quality of soil penetration and an increase in its traction resistance. The height of the ridge and the total thickness of the softened layer increase as this angle changes from 15° to 30°, but remain unchanged between 30° and 40°. Increasing the unit's travel speed from 6.0 km/h to 8.0 km/h improves the quality of soil mixing and increases the traction resistance of the working body. In order to create agrotechnically required pulses with low energy consumption, it is necessary to use a pulse receiver in the form of spherical discs with a diameter of 550 mm.

Conclusion

In order to ensure that the combined aggregate collects cotton at the level of agrotechnical requirements with low energy consumption at speeds of 6-8 km/h, the diameter of the cotton pickers should be in the range of 515-570 mm and they should be installed at an angle of 28-330 with respect to the direction of movement.

Table 2. A plan for conducting multifactorial experiments and their results

№	X_1	X_2	X_3	Y_1				Y_2				Y_3			
				1	2	3	Ÿp	1	2	3	Ÿp	1	2	3	Ÿp
1	-1	-1	-1	74,44	74,31	74,58	74,44	12,50	12,10	11,80	12,13	0,94	0,95	0,96	0,95
2	+1	-1	-1	76,18	76,35	76,49	76,33	26,70	27,10	27,30	27,03	3,87	3,88	3,89	3,88
3	-1	+1	-1	74,30	74,39	74,47	74,38	14,50	14,20	14,80	14,50	1,68	1,67	1,66	1,67
4	+1	+1	-1	76,45	76,58	76,73	76,58	29,20	29,40	29,70	29,43	4,61	4,60	4,59	4,60
5	-1	-1	+1	77,55	77,71	77,38	77,54	9,90	9,80	10,10	9,93	1,74	1,72	1,73	1,73
6	+1	-1	+1	79,32	79,46	79,59	79,45	24,80	24,60	25,10	24,83	4,67	4,66	4,65	4,66
7	-1	+1	+1	77,78	77,65	77,82	77,75	12,60	12,10	12,20	12,30	2,45	2,44	2,46	2,45
8	+1	+1	+1	79,83	79,70	79,55	79,69	27,10	27,30	27,20	27,20	5,39	5,38	5,37	5,38
9	-1	+0	+0	76,11	75,98	76,25	76,11	14,00	14,50	14,20	14,23	1,63	1,64	1,62	1,63
10	+1	+0	+0	78,02	78,15	77,90	78,02	29,40	28,90	29,10	29,13	4,58	4,57	4,56	4,57
11	+0	-1	+0	78,85	78,57	78,72	78,71	25,30	24,80	24,60	24,90	2,26	2,27	2,25	2,26
12	+0	+1	+0	78,86	79,05	78,95	78,95	27,10	27,60	27,40	27,36	2,97	2,98	2,99	2,98
13	+0	+0	-1	77,28	77,39	77,18	77,28	29,00	29,50	29,30	29,26	2,30	2,29	2,28	2,29
14	+0	+0	+1	80,31	80,46	80,38	80,38	27,00	27,20	27,10	27,10	3,08	3,08	3,07	3,08

As the speed increased, the degree of soil compaction and the drag resistance of the working body increased, while the height of the ridge decreased.

Literature:

- Худоёрв А.Н., Мамадалиев М.Х., Мирзаев Х.А. Тупрокқа минимал ишлов берувчи комбинациялашган агрегат // Фарғона Политехника институти илмий-техника журнали.-2006.-№4.-Б. 59-61.
- Бойметов Р.И., Игамбердиев А.У. Комбинациялашган агрегат пушта олгичининг турини танлаш ва параметрларини асослаш // ФарПИ илмий-техника журнали. – Фарғона, 2020, – № 2 (24). – Б.43-48
- Аугамбаев М.А., Терехов Ю.М., Шагиева М.Ф. Ссовершенствование методики планирования эксперимента применительно к конкретным исследованиям по механизации хлопководства. – Янгиюль. 1981. – 85 с.
- Аугамбаев М., Иванов А.З., Терехов Ю.И. Основы планирования научно-исследовательского эксперимента. – Ташкент: Ўқитувчи, 1993. 336 б.
- Спирин Н.А., Лавров В.В. Методы планирования и обработки результатов инженерного эксперимента. – Екатеринбург: ГОУ ВПО Уральский государственный технический университет – УПИ, 2004. – 258 с.
- Испытания сельскохозяйственной техники. Методы определения условий испытаний. ГОСТ 20915-11. – Москва: Стандартинформ, 2013. – 23 с.
- Испытания сельскохозяйственной техники. Машины и орудия для глубокой обработки почвы. Программа и методы испытаний. ТSt 63.04:2001 // Издание официальное. – Ташкент, 2001. – 54 с.
- Испытания сельскохозяйственной техники. Методы энергетической оценки машин. ТSt 63.03.2001// Издание официальное. – Ташкент, 2001.– 59 с.
- Испытания сельскохозяйственной техники. Методы расчета экономической эффективности испытываемой сельскохозяйственной техники. РД Уз 63.03-98 // Издание официальное. – Ташкент, 1998. – 49 с.
- Тўхтақўзиев А. Тупрокнинг сферик диск ишчи сиртидаги ҳаракат тезлиги // Механика муаммолари. –Тошкент, 2009. – № 5-6. – Б. 75-78.
- Джонсон Н., Лион Ф. Статистика и планирование эксперимента в технике и науке. Методы обработки данных/ Пер. с англ. – Москва: Мир, 1990. – 610 б.
- Igamberdiyev A.U., Influence of the diameter of the comb maker on the performance of the combined unit. International Journal of Advanced Research in Science, Engineering and Technology. – India, 2020. Vol.,7, ISSUE 9, – P.14792-14795.

RESEARCH ARTICLE

Labor Market In The Era Of Artificial Intelligence And Automation: A Comparative Analysis Of Global Trends And The Experience Of Uzbekistan

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Abstract

The rapid development of Artificial Intelligence (AI) and automation technologies is fundamentally transforming global labor markets. Although the dual impact of these technologies – the reduction of traditional jobs and the increasing demand for highly skilled professions – has been widely studied globally, research comparing the economy of Central Asia, particularly Uzbekistan, with global trends is still insufficient. To fill this gap, this article conducts a comparative analysis between global AI trends and the labor market of Uzbekistan. The research utilizes methods of deduction and cause-and-effect analysis, employing international reports such as the WEF's "Future of Jobs Report 2025", the International Labour Organization's (ILO) "AI Adoption and Its Impact on Jobs (2025)", and the UN and ILO's "Mind the AI Divide (2024)", as well as empirical literature related to Uzbekistan, as secondary sources. The results of the analysis indicate that three global trends – the contraction of middle – skill jobs, the growing demand for highly skilled specialists, and the exacerbation of the digital divide – are also being confirmed in the labor market of Uzbekistan. While plans to cut 2,141 administrative positions in the public sector reflect the global digitalization pattern, the growing demand for AI and cloud computing specialists aligns with WEF projections. However, the "Robot Productivity Paradox" identified by Flores (2022) has not yet been confirmed in the case of Uzbekistan, which remains an important area for future research. The article concludes with practical recommendations for the state, the education system, and the private sector, aimed at ensuring inclusive adaptation to technological changes – that is, adaptation that encompasses all strata of society.

Keywords: artificial intelligence, automation, labor market, comparative analysis, digitalization, Uzbekistan, digital divide.

Annotatsiya

Sun'iy intellekt (SI) va avtomatlashtirish texnologiyalarining keskin rivojlanishi global mehnat bozorlarini tubdan o'zgartirmoqda. Ushbu texnologiyalarning ikki tomonlama ta'siri – an'anaviy ish o'rinlarini qisqartirish va yuqori malakali kasblarga talab kuchaytirish - global miqyosda keng o'rganilgan bo'lsa-da, O'rta Osiyo, xususan O'zbekiston iqtisodiyotini global tendentsiyalar bilan taqqoslaydigan tadqiqotlar hali yetarli emas. Mazkur maqola ushbu bo'shliqni to'ldirish maqsadida global SI tendentsiyalari va O'zbekiston mehnat bozori o'rtasida taqqoslama tahlil o'tkazadi. Tadqiqotda deduksiya va sabab-oqibat tahlili metodlaridan foydalanilgan bo'lib, WEF ning Future of Jobs Report 2025, Xalqaro Mehnat Tashkilotining (XMT)ning "AI Adoption and Its Impact on Jobs (2025)" va BMT va XMT ning "Mind the AI Divide (2024)" kabi xalqaro hisobotlar hamda O'zbekistonga oid empirik adabiyotlar ikkilamchi manba sifatida qo'llanilgan. Tahlil natijalari shuni ko'rsatadiki, o'rta malakali ish o'rinlarining qisqarishi, yuqori malakali mutaxassislariga talabning o'sishi va raqamli tengsizlikning kuchayishi kabi uchta global tendentsiya O'zbekiston mehnat bozorida ham o'z tasdig'ini topmoqda. Davlat sektorida 2141 ta ma'muriy lavozimni qisqartirish rejalari global raqamlashtirish namunasini aks ettirsa, AI va bulutli hisoblash mutaxassislariga bo'lgan talab o'sishi WEF prognozlari bilan mos tushadi. Biroq Flores (2022) tomonidan aniqlangan "Robotlar samaradorligi paradoksi" O'zbekiston holatida hali tasdiqlanmagan bo'lib, bu kelajak tadqiqotlar uchun muhim soha bo'lib, qolmoqda. Maqola davlat, ta'lim tizimi va xususiy sektor uchun texnologik o'zgarishlarga inklyuziv moslashishni ya'ni jamiyatning barcha qatlamlarini qamrab olgan holda moslashishni ta'minlashga qaratilgan amaliy tavsiyalar bilan yakunlanadi.

Kalit so'zlar: sun'iy intellekt, avtomatlashtirish, mehnat bozori, taqqoslama tahlil, raqamlashtirish, O'zbekiston, raqamli tengsizlik.

Kirish: Sun'iy intellekt (SI) va avtomatlashtirish texnologiyalarining jadal rivojlanishi XXI asr iqtisodiyotining asosiy harakatlantiruvchi kuchiga aylandi. Mehnat bozori ushbu o'zgarishlarga eng sezgir bo'lgan soha sifatida diqqat markazida turibdi. Bir tomondan, avtomatlashtirish an'anaviy, takroriy ishlarni qisqartirib, ishsizlikni kuchaytirish xavfini yuzaga keltirsa, ikkinchidan, yuqori malakali ish o'rinlari va kasblarning shakllanishiga imkoniyat bermoqda. (Agama & Okoh, 2025). Ushbu ikki tomonlama ta'sir global miqyosda keng o'rganilmoqda, biroq rivojlanayotgan mamlakatlar, xususan O'rta Osiyo mintaqasidagi iqtisodiyotlar holatida tadqiqotlar hali yetarli emas (Millington, 2017).

O'zbekiston bu jihatdan alohida o'rganishga sazovor namuna hisoblanadi. Mamlakatimizda "Raqamli O'zbekiston — 2030" strategiyasi doirasida iqtisodiyot va davlat boshqaruvini raqamlashtirish jarayoni jadal amalga oshirilmoqda (Khaitbaeva et al., 2026). Amaliy ma'lumotlar ushbu o'zgarishlarning mehnat bozoriga allaqachon ta'sir ko'rsatayotganini tasdiqlaydi: 2025 yil holatiga ko'ra, davlat sektorida raqamlashtirish orqali jarayonlarni optimallashtirish maqsadida 2141 ta ma'muriy lavozimlar qisqartirilishi rejalashtirilgan bo'lsa (Khusainov va Ibragimova, 2026), bir vaqtning o'zida IT sohasida talab keskin o'sib bormoqda. Shu bilan birga, global o'zgarishlar rivojlanayotgan mamlakatlardagi ish

o'rinlari bozoriga o'zining yangi tahdidlari bilan qattiq zarba berayotganini ko'rishimiz mumkin: malaka taqchilligi va ijtimoiy himoya tizimlarining zaifligi (Flores, 2022). O'zbekistonda esa bu masala aholimizning aksariyati yoshlardan iboratligi, qishloq va shahar sharoitlaridagi farqlar, shuningdek, iqtisodiyotimizning tez o'zgarayotgani sababli qiyinlashib bormoqda. Mavjud adabiyotlar tahlili shuni ko'rsatadiki, O'zbekiston mehnat bozoridagi mazkur jarayonlar global tendentsiyalar bilan qiyosiy tahlil qilinmagan va yaxlit empirik asosga ega emas (Khusainov & Ibragimova, 2026). Ushbu bilim bo'shlig'ini to'ldirish maqsadida mazkur tadqiqot quyidagi savolga javob izlaydi: Sun'iy intellekt va avtomatlashtirish global mehnat bozorlariga ta'sirining umumiy tendentsiyalari va O'zbekiston mehnat bozori bilan taqqoslaganda qanday farq va o'xshashliklarni namoyon etadi? Tadqiqotning maqsadi — global tendentsiyalar va O'zbekiston tajribasini taqqoslama tahlil qilish asosida mehnat bozorining kelajakdagi ko'rinishini prognozlash hamda davlat siyosati uchun amaliy tavsiyalar ishlab chiqishdir.

Adabiyotlar Tahlili: Sun'iy Intellekt va avtomatlashtirish mehnat bozorlariga ta'sirini o'rganuvchi global adabiyotlar bir qator muhim moyilliklarni ko'rsatadi. Millington (2017) texnologiyalar endilikda kasb tanlamayotganini ya'ni jismoniy va aqliy mehnatkashlarni birdek ishidan mahrum qilishi mumkinligini aytib o'tgan. Va rivojlanayotgan mamlakatlarda ish o'rinlarining 65-85 foizi avtomatlashtirish xavfiga uchraganini hisoblagan. WEF ning "Future of Jobs Report 2025" ga ko'ra, 2030-yilgacha 170 millionta yangi ish o'rni yaratilishi, 92 millionta ish o'rinlari

yo'qolishi va ko'nikmalarning 39 foizi o'zgarishini prognoz qiladi. Flores (2022) Braziliya ma'lumotlari orqali "Robotlar samaradorligi paradoksi"ni aniqlaydi. Unga ko'ra, robotlar joriy etilgandan keyin unumdorlik besh yillik kechikish bilan o'sadi. Agama va Okoh (2025) esa o'z maqolalarida avtomatlashtirishning ikki tomonlama ta'siriga e'tibor qaratadilar. Bir tomondan past malaka talab qiladigan ishlarni qisqartirsa, ikkinchi tomondan yuqori malakali mutaxassislariga bo'lgan ehtiyojni ko'paytiradi. Mualliflarning ta'kidlashicha, agar ta'lim tizimida tegishli islohotlar o'tkazilmasa va raqamli infratuzilmaga yetarlicha investitsiya kiritilmasa, mazkur jarayon jamiyatdagi ijtimoiy-iqtisodiy tengsizlikni yanada kuchaytirib yuborishi mumkin. BMT va Xalqaro Mehnat Tashkilotining "Mind the AI Divide (2024)" hisoboti bu xavfni yanada tasdiqlaydi: rivojlangan mamlakatlarning 118 tasi xalqaro Sun'iy Intellekt boshqaruvi muhokamalarida umuman ishtirok etmaydi.

O'zbekiston holatida bu mavzu yetarli darajada o'rganilmagan (Khusainov va Ibragimova, 2026). Mavjud tadqiqotlar raqamlashtirish jarayonining ikki qarama-qarshi ko'rinishini qayd etadi: davlat sektorida 2141 ta ma'muriy lavozimlar qisqartirilishi rejalashtirilgan bo'lsa, IT sohasida talab keskin o'smoqda. Bu esa WEF (2025) aniqlagan global tendentsiya bilan uyg'un tushadi (Khusainov va Ibragimova, 2026). Rozimurodova va Rasulov (2025) esa shahar-qishloq raqamli tafovuti "Mind the AI Divide (2024)" ning ogohlantirishlarini mahalliy miqyosda tasdiqlaganini ko'rsatadi. Khaitbaeva va boshqalar (2026) Sun'iy Intellekt integratsiyasi O'zbekiston Yalpi Ichki Mahsulotini yiliga 7 foizga oshirishi mumkinligini ta'kidlasa-da, infratuzilma va

kadrlar tanqisligi asosiy to'siq bo'lib qalayotganini qayd etadi. Qalandarovna va Xaydarova (2026) o'zlarining amaliy tadqiqotlarida AI-HRM platformasi joriy etilishi xodimlar almashinuvini 39 foizga kamaytirganini hujjatlashtirishgan. Shunday bo'lsa-da, O'zbekiston mehnat bozorini global tendentsiyalar bilan metodologik jihatdan qat'iy asosda qiyoslaydigan tadqiqot hozircha mavjud emas – mazkur maqola aynan shu bo'shliqni to'ldiradi.

Metodologiya: Mazkur tadqiqot taqqoslama tahlil metodiga asoslanadi. Ushbu metod ikki yoki undan ortiq ob'ektni bir xil mezon asosida o'rganib, o'xshashlik va farqlarni aniqlash imkonini beradi. Bizning maqolamizda esa global mehnat bozori tendentsiyalari va O'zbekiston mehnat bozori o'xshashlik va farqlarni aniqlash imkonini beradi (Flores, 2022). Taqqoslama metod tanlanganligi quyidagilar bilan asoslanadi: mavjud adabiyotlarda global va O'zbekiston bo'yicha tadqiqotlar alohida-alohida olib borilgan bo'lib, ularni yaxlit qiyosiy ko'rinishda tahlil qilish tadqiqot bo'shlig'ini to'ldirish uchun zarur (Khusainov va Ibragimova, 2026). Tadqiqot ikkilamchi ma'lumotlar ya'ni olimlar tomonidan yig'ib, tayyorlab qo'yilgan ma'lumotlar asosida qurilgan. Ma'lumot manbalari uch guruhga bo'linadi. Birinchi guruh – xalqaro hisobot va statistikalar: WEF ning Future of Jobs Report 2025, BMT va Xalqaro Mehnat Tashkilotining Mind the AI Divide (2024), Millington (2017) ning K4D hisoboti, shuningdek Agama va Okoh (2025) ning tahliliy maqolasi. Ushbu manbalar global tendentsiyalar, miqdoriy prognozlar va rivojlanayotgan mamlakatlar holatini baholash uchun asos bo'lib xizmat qiladi. Ikkinchi guruh – O'zbekistonga oid ilmiy

maqolalar: Khusainov va Ibragimova (2026), Rozimurodova va Rasulov (2025), Qalandarovna va Xaydarova (2026), Khaitbaeva va boshqalar (2026). Bu manbalar O'zbekiston mehnat bozorining joriy holati, raqamlashtirish sur'ati va ish o'rinlari tarkibidagi o'zgarishlar haqida empirik ma'lumot beradi. Manbalarning uchinchi guruhiga modellashtirish bo'yicha qilingan izlanishlar kiradi. Masalan, butun dunyo bo'yicha umumiy xulosalar qilishda Floresning (2022) ekonometrik modeli bizga nazariy asos bo'lib xizmat qildi. Tahlil quyidagi ketma-ket bosqishlarda amalga oshirildi. Dastlab, global miqyosdagi asosiy tendentsiyalar va ko'rsatkichlar xalqaro manbalardan ajratib olindi va O'zbekistonga xos empirik ma'lumotlar mahalliy va ilmiy adabiyotlardan tizimli ravishda to'plandi. So'ng, ikkala guruh ma'lumotlari uchta qiyosiy me'zon: bandlik tuzilmasining o'zgarishi, malaka talablari dinamikasi va amalga oshirilgan siyosiy choralar bo'yicha taqqoslandi. So'ngra o'xshashlik va farqlar asosida xulosalar va zarur tavsiyalar ishlab chiqildi.

Tahlil va Natijalar: Tadqiqotning deduktiv yondashuviga muvofiq, dastlab global darajada kuzatilgan uchta asosiy tendentsiya O'zbekistondagi mavjud holat bilan bosqichma-bosqich qiyoslanadi. Shundan so'ng, har bir tendentsiya doirasidagi sabab-oqibat aloqalari ilmiy jihatdan asoslab beriladi. Birinchi tendentsiya o'rta malakali ish o'rinlarining siqib chiqarilishi bo'yicha hisoblanadi. Global adabiyotlarga asoslanadigan bo'lsak, bu hodisaning mexanizmi shuni ko'rsatadiki, algoritmlashtirish mumkin bo'lgan, kunlik takrorlanadigan ishlar birinchi navbatda avtomatlashtiriladi (Millington, 2017). Jahon Iqtisodiyot Forumi (WEF, 2025)

mazkur mexanizmni miqdoriy ko'rsatkichlar orqali tasdiqlaydi: 2030-yilga borib butun dunyo bo'ylab asosan ma'lumotlarni qayta ishlash, kotiblik hamda hisobotlarni shakllantirish kabi sohalarda jami 92 million ish o'zni qisqarishi prognoz qilinmoqda. O'zbekistonda ham bu tendentsiya bevosita kuzatilmoqda: hukumatimiz 2025-yilga qadar davlat sektorida 2141 ta ma'muriy lavozimni qisqartirishi rejalashtirilgan bo'lib, ularning katta qismi Soliq qo'mitasi, Suv xo'jaligi vazirligi va Qishloq xo'jaligi vazirligida jamlangan (Khusainov va Ibragimova, 2026). Ushbu ko'rsatkichlar global kutuvlarning O'zbekiston sharoitida ham o'z tasdig'ini topayotganini isbotlovchi eng kuchli empirik dalil bo'lib, Khusainov va Ibragimova (2026) o'z tadqiqotlarida ushbu bog'liqlikni to'g'ridan to'g'ri Jahon Iqtisodiyot Forumi (WEF, 2025) qayd etgan tendentsiyalari bilan uzviy bog'laydi. Bu esa o'z navbatida, ikkita mutlaqo mustaqil manba aynan bir xil xulosaga kelganini anglatadi.

Ikkinchi tendentsiya esa yuqori malakali ish o'rinlariga talab o'sishi bo'yicha hisoblanadi. Raqamlashtirish jarayonlari o'z-o'zidan yangi infratuzilmani shakllantirish va uni boshqarishga qodir bo'lgan mutaxassislarga bo'lgan ehtiyojni yuzaga keltiradi. Jahon Iqtisodiyot Forumining (WEF, 2025) ma'lumotlariga ko'ra, 2030-yilga qadar sun'iy intellekt (AI) hamda katta ma'lumotlar (big data) bo'yicha mutaxassislarning eng jadal o'sib borayotgan kasblar reytingida yetakchilik qiladi. O'zbekistonda bu tendentsiya allaqachon namoyon bo'lgan bo'lib: 2024-yil holatiga ko'ra Sun'iy Intellekt sohasida 500 dan ortiq, Bulutli Hisoblash (Cloud Computing) sohasida esa 300 dan ortiq bo'sh ish o'ri mavjud. Bulutli arxitektorning (Cloud

architect) oylik maoshi esa 20-50 million so'mga yetmoqda (Khusainov va Ibragimova, 2026). Hukumatimizning "1 million AI mutaxassisi" dasturi tashabbuslari va IT Park uchun belgilangan imtiyozli rejimni 2040-yilga qadar uzaytirishi aynan ushbu talabni rag'batlantirishga qaratilgan (Khaitbayeva, 2026). Bu natija Agama va Okoh (2025) tomonidan ilgari surilgan avtomatlashtirishning "Ikki yoqlama ta'siri" konsepsiyasini bevosita tasdiqlaydi ya'ni an'anaviy ish o'rinlarining qisqarishi va yangi texnologik kasblarning yaratilishi parallel ravishda sodir bo'lmoqda.

Uchinchi tendentsiya bu – raqamli tengsizlikdir. Avtomatlashtirish natijasida daromadlarning kapital egalari foydasiga taqsimlanishi hamda ta'lim va texnologiyalardan foydalanish imkoniyati cheklangan aholi qatlamlarining ortda qolishi kabi sabab-oqibat zanjiri "Mind the AI Divide, 2024" hisobotida global miqyosda hujjatlashtirilgan. Shuni ham aytish joizki, mazkur manbada 118 ta rivojlanayotgan mamlakat sun'iy intellekt bo'yicha xalqaro muhokamalarda ishtirok etmayotgani, bu holat esa ularning manfaatlari global qarorlar qabul qilish jarayonidan chetda qolib ketishiga olib kelayotgani ta'kidlanadi. O'zbekiston misolida ushbu tendentsiya shahar va qishloq sharoitidagi katta farqlarda aniq ko'zga tashlanadi. Xususan, hududlarda internet qamrovi 66 foiz atrofida cheklangani, oliy ta'lim tizimida STEM yo'nalishi bitiruvchilari ulushi 23 foizni tashkil etishi hamda mahalliy korxonalarning 65 foizi malakali IT mutaxassislarni topishda qiyinchiliklarga duch kelayotgani buning amaliy isbotidir (Khaitbayeva, 2026). Shuningdek Rozimurodova va Rasulov (2025) qishloq yoshlarining zamonaviy raqamli ta'lim

kurslari hamda startap inkubatorlar muhitidan chetda qolib ketayotgani kelgusida bu tafovutni yanada chuqurlashtirishi mumkinligidan ogohlantiradi. Shu tarzda ushbu natija Mind the AI Divide (2024) ning asosiy tezisini mahalliy empirik ma'lumotlar orqali mustahkamlaydi.

Yuqoridagi qayd etilgan uchinchi tendentsiyaga o'ziga xos istisno sifatida Flores (2022) tomonidan ilgari surilgan "Robotlar samaradorligi paradoksi"ga alohida e'tiborni qaratish lozim. Braziliya

misolida mehnat unumdorligi robot texnologiyasi joriy etilgandan besh yil o'tib o'sishni boshlagan. O'zbekistonda tashkiliy kapital qayta shakllanishi jarayoni hali to'liq boshlanmagan. Bu paradoksning O'zbekiston sharoitida ham namoyon bo'lishi mumkinligi kelajak tadqiqotlar uchun muhim yo'nalish bo'lib qolmoqda.

Quyidagi jadval har uchala tendentsiya bo'yicha o'tkazilgan qiyosiy tahlil natijalarini ixcham shaklda aks ettiradi:

Mezon	Global tendentsiya	O'zbekiston holati	Moslik
O'rta malakali ish o'rinlari	Kamaymoqda (WEF, 2025)	2141 ta lavozim qisqartiriladi (Khusainov va Ibragimova, 2026)	Tasdiqlangan
Yuqori malakali talab	O'smoqda (WEF, 2025)	AI va Cloud bo'sh lavozimlar o'smoqda	Tasdiqlangan
Raqamli tengsizlik	Kuchaymoqda (Mind the AI Divide, 2024)	Shahar va qishloq tafovuti kuchaymoqda	Tasdiqlangan
Unumdorlik paradoksi	5 yillik kechikish (Flores, 2022)	Hali o'lchanmagan	Tasdiqlash mumkin emas

O'tkazilgan qiyosiy tahlil natijalari shuni ko'rsatmoqdaki, O'zbekiston mehnat bozori global tendentsiyalardan tubdan farq qilmaydi. Xususan, mehnat bozoridagi qutblanish ya'ni polyarizatsiya, yuqori malakali kadrlar taqchilligi hamda hududiy raqamli tengsizlik kabi har uchala umumjahon tendentsiyasi mamlakatimiz sharoitida ham o'zining to'liq tasdig'ini topdi. Biroq transformatsiya jarayonlarining jadalligi hamda tashkilotlarning bunga tayyorgarlik darajasi jihatdan O'zbekiston hali o'tish ya'ni tranzit bosqichida bo'lib, bu holat ham xavf, ham imkoniyat sifatida talqin qilinishi mumkin.

Xulosa: Taqqoslama tahlil shuni ko'rsatadiki, O'zbekiston mehnat bozorida kuzatilyotgan uchta asosiy o'zgarish: o'rta

malakali ish o'rinlarining qisqarishi, yuqori malakali kadrlarga talabning ortishi va raqamli tengsizlikning kuchayishi – global tendentsiyalar bilan to'liq mos tushadi. Bu O'zbekistondagi o'zgarishlarni dunyo miqyosidagi keng jarayonning bir qismi sifatida baholash kerakligini tasdiqlaydi. Biroq Flores (2022) tomonidan aniqlangan "Robotlar samaradorligi paradoksi" O'zbekiston iqtisodiyoti uchun dolzarb ogohlantirish bo'lib xizmat qilmoqda. Mamlakatda tashkiliy kapitalning qayta shakllanishi jarayonlari hali to'laqonli boshlanmaganligini inobatga olsak, qisqa muddatli istiqbolda mehnat unumdorligining keskin o'sishi emas, balki ma'lum darajada sekinlashuvini kutish realistikroq. Raqamli tengsizlik masalasi esa eng ustuvor muammo maqomini saqlab

qolmoqda. Ta'lim tizimidagi islohotlar va raqamli infratuzilmaga bir vaqtning o'zida sarmoya kiritilmas ekan, avtomatlashtirishning foydalari faqat shahar va yuqori malakali aholi qatlamiga to'g'ri kelib qolaveradi. Tadqiqot xulosalariga tayangan holda uchta asosiy yo'nalish bo'yicha quyidagilar tavsiya etiladi. Birinchidan, hukumat qisqartirilgan xodimlarni qayta kasbga yo'naltirishi va hududlarda raqamli

markazlarni ko'paytirilishi kerak. Ikkinchidan, ta'lim muassasalari AI va raqamli savodxonlik darslarini majburiy o'quv dasturining bir qismiga aylantirishlari lozim. Uchinchidan, xususiy biznes vakillari AI-HRM tizimlarini mahalliy sharoitlarga moslab ishlatishlari kutiladi. Kelgusidagi tadqiqotlarda olingan xulosalarni uzoq muddatli kuzatuvlar va chuqur statistik tahlillar yordamida amalda tasdiqlash tavsiya etiladi.

Foydalanilgan Adabiyotlar ro'yxati:

- Agama, O., & Okoh, O. F. (2025). Examining the economic implication of automation on labor markets in developing countries. *Socio Economy and Policy Studies*, 5(2), 49-56.
- International Labour Organization. (2025). Artificial intelligence adoption and its impact on jobs. G20 Framework Working Group Technical Paper. ILO.
- Flores, R. R. (2022). Automation and labor markets in developing counties (Doctoral dissertation, Georgetown University).
- Khaitbaeva, L., Sofia, A., & Bekimbetova, G. (2026). The impact of artificial intelligence on the economy and its future prospects: A case study of Uzbekistan. *ICEBEF Proceedings*, Vol. 4
- Khusainov, R. R., & Ibragimova, S. A. (2026). The impact of automation and artificial intelligence on the structure of employment in Uzbekistan. *Latin American Journal of Education*, 6(2), 91-104. <https://doi.org/10.5281/zenodo.18601364>
- Millington, K. A. (2017). How changes in technology and automation will affect the labour market in Africa. K4D Helpdesk Report. Institute of Development Studies, Brighton, UK.
- Qalandarovna, A. G., & Xaydarova, M. (2026). Prospects for managing human resources through artificial intelligence: An applied scientific approach based on the case of Uzbekistan. *Central Asian Journal of Innovations on Tourism Management and Finance*, 7(1), 94-98.
- Rozimurodova, D., & Rasulov, R. O. (2025). Artificial intelligence and the labor market: Opportunities and risks (the case of Uzbekistan). *Journal of Multidisciplinary Science and Innovations*, 1279-1281.
- United Nations & International Labour Organization. (2024). Mind the AI Divide: Shaping a global perspective on the future of work. UN Office of the Secretary-General's Envoy on Technology; ILO. <https://doi.org/10.18356/9789211066524>
- World Economic Forum. (2025). The future of jobs report 2025. WEF Centre for the New Economy and Society. <https://www.weforum.org/publications/the-future-of-jobs-report-2025/>

RESEARCH ARTICLE

Teacher Readiness for Human-Centred Generative AI Integration in Uzbekistan

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Abstract

Generative artificial intelligence (GenAI) is rapidly changing educational practices, yet the effectiveness of its integration depends less on technological availability than on teachers' pedagogical, ethical, linguistic, and organizational readiness. This study examines teacher readiness for human-centred GenAI integration in English-medium and international-school classrooms in Uzbekistan, where multilingual education, expanding international curricula, and accelerated digital transformation create a distinctive educational context. Drawing on the Technological Pedagogical Content Knowledge framework, technology acceptance research, teacher cognition theory, and recent international AI competency frameworks, the study develops a multidimensional conceptual model of teacher readiness. The proposed model integrates AI literacy, pedagogical readiness, English-medium instructional competence, ethical awareness, perceived usefulness, self-efficacy, institutional support, and human agency. A mixed-methods empirical design is proposed for future validation through teacher surveys and semi-structured interviews. The analytical synthesis indicates that readiness should not be conceptualized as simple willingness to use AI but as the capacity to evaluate, adapt, govern, and pedagogically integrate GenAI while preserving teacher agency and student-centred learning. The study argues that professional development in Uzbekistan should move beyond technical AI training toward context-sensitive, multilingual, ethically grounded, and institutionally supported models of teacher development.

Keywords: generative artificial intelligence; teacher readiness; English-medium instruction; international schools; Uzbekistan; AI literacy; teacher development

1. Introduction

Generative artificial intelligence has rapidly moved from a specialist technological domain into everyday educational practice, creating a profound transformation in the relationship among teachers, learners, knowledge, language, and digital technologies. Unlike earlier educational technologies that generally performed predefined functions, contemporary generative AI systems can produce explanations, lesson plans,

assessment materials, examples, translations, feedback, summaries, questions, and other forms of instructional content in response to natural-language prompts. The educational significance of this development therefore extends beyond the adoption of another digital tool. It raises fundamental questions concerning what teachers need to know, how they should exercise professional judgment, how students should interact with machine-generated knowledge, and how educational

institutions should govern the use of systems whose outputs may be inaccurate, biased, culturally inappropriate, or pedagogically unsuitable. UNESCO has consequently emphasized that the integration of generative AI into education should be guided by a human-centred approach that protects human agency, privacy, equity, safety, and meaningful educational participation [1].

These questions are particularly significant in English-medium and international-school contexts. In such classrooms, English frequently functions not only as a subject but also as a medium through which mathematics, science, social sciences, business, technology, and other disciplinary knowledge is taught. Teachers therefore operate simultaneously as subject specialists, language mediators, curriculum interpreters, and facilitators of intercultural communication. The emergence of GenAI introduces another layer into this already complex pedagogical environment. AI systems can generate fluent English explanations, simplify disciplinary texts, translate concepts across languages, produce differentiated learning materials, and provide immediate language feedback. At the same time, their apparent linguistic fluency can conceal factual inaccuracies, culturally inappropriate formulations, stereotypical representations, or language that is formally correct but pedagogically unsuitable for particular learners. Consequently, linguistic fluency in AI output cannot be treated as equivalent to pedagogical quality.

The Uzbek educational context makes this issue especially relevant. Uzbekistan has been undergoing substantial digital transformation in education, with national and international initiatives increasingly emphasizing digital learning,

teacher capacity development, and innovative educational technologies. UNICEF reports that Uzbekistan was selected as a Learning Pioneer country and has participated in initiatives designed to identify, co-create, and pilot digital learning solutions, while investments in school connectivity and digital infrastructure have expanded considerably [2]. More recently, teacher-development initiatives in Uzbekistan have explicitly included competencies related to information and communication technologies and artificial intelligence, involving school leaders, STEM teachers, and foreign-language teachers [3]. These developments suggest that the question is no longer whether Uzbek educators will encounter AI-supported education, but rather whether they will possess the professional knowledge and institutional conditions necessary to use it responsibly and effectively.

The international-school and English-medium sector presents a particularly important setting for examining this transition because teachers in these environments may work with international curricula, multilingual student populations, externally developed assessment systems, and pedagogical expectations influenced by international educational standards. The coexistence of English, Uzbek, Russian, and potentially other languages creates opportunities for AI-supported multilingual scaffolding, but it also introduces concerns about linguistic equity and the dominance of English-language AI resources. Teachers may use GenAI to generate bilingual explanations, adapt texts to different proficiency levels, construct vocabulary exercises, or support content-and-language integrated learning. However, such practices require teachers to recognize

when AI-generated linguistic mediation enhances comprehension and when it risks reducing conceptual complexity, reinforcing translation dependence, or marginalizing students' linguistic resources.

The theoretical problem underlying this study is therefore the inadequacy of conceptualizing AI adoption as a binary distinction between users and non-users. Traditional technology-acceptance models emphasize constructs such as perceived usefulness and perceived ease of use [4], while educational technology frameworks demonstrate that effective integration requires the interaction of technological, pedagogical, and content knowledge [5]. In language education, teacher cognition research further shows that what teachers know, believe, and experience influences how they interpret and implement pedagogical innovations [6]. GenAI makes these relationships more complex because teachers must not only know how to operate a system but also understand its limitations, evaluate its outputs, design appropriate pedagogical interactions, and retain responsibility for educational decisions.

Accordingly, this study conceptualizes teacher readiness as a multidimensional construct consisting of technological and AI literacy, pedagogical readiness, content and language awareness, ethical judgment, self-efficacy, perceived usefulness, human agency, and organizational support. The central argument is that teachers should not be considered ready for GenAI merely because they can produce prompts or use chatbot interfaces. Rather, readiness should reflect their ability to determine when AI should be used, why it should be used, how its output should be evaluated, and when

human intervention should override or constrain AI-generated recommendations.

The study has three principal objectives. First, it synthesizes theoretical and empirical perspectives relevant to teacher readiness for GenAI integration. Second, it develops a context-sensitive conceptual model applicable to English-medium and international-school classrooms in Uzbekistan. Third, it identifies the organizational, pedagogical, ethical, and professional-development conditions that may facilitate or inhibit meaningful adoption. By connecting TESOL, multilingual education, artificial intelligence, teacher development, ethics, and organizational change, the study seeks to move the discussion from technological enthusiasm or resistance toward a more comprehensive account of professional readiness.

2. Literature Review

Research on educational technology has long demonstrated that successful classroom integration cannot be reduced to technological competence. Shulman's influential concept of pedagogical content knowledge established that effective teaching requires teachers to understand not only subject matter but also how that subject matter can be represented and taught to particular learners [7]. Mishra and Koehler subsequently extended this perspective through the Technological Pedagogical Content Knowledge framework, arguing that technology integration emerges from the interaction among technological knowledge, pedagogical knowledge, and content knowledge rather than from technological knowledge alone [5]. This framework provides an important theoretical foundation for GenAI integration because generative systems do not operate

independently of curriculum and pedagogy. The same AI-generated explanation may be useful in one classroom and inappropriate in another depending on the subject, learner age, language proficiency, curriculum objectives, and assessment context.

Technology acceptance research provides a complementary perspective. Davis's Technology Acceptance Model proposes perceived usefulness and perceived ease of use as central determinants of technology acceptance [4]. Venkatesh et al. later incorporated multiple psychological and organizational variables into the Unified Theory of Acceptance and Use of Technology, emphasizing performance expectancy, effort expectancy, social influence, and facilitating conditions [8]. These models are useful for explaining why teachers may be willing to experiment with GenAI, but they do not fully capture the ethical and pedagogical dimensions of generative systems. A teacher may perceive ChatGPT or another GenAI system as highly useful while simultaneously recognizing that unrestricted use could undermine student autonomy or academic integrity. Thus, acceptance and readiness should not be treated as identical constructs.

Research specifically examining AI in education has highlighted both opportunities and limitations. Zawacki-Richter et al. [9], in a systematic review of artificial intelligence applications in higher education, identified applications involving assessment, prediction, adaptive systems, intelligent tutoring, and profiling, while also noting the relative absence of educator-centred perspectives. This omission is especially important in the GenAI era because teachers are increasingly becoming intermediaries between AI systems and learners. Recent research on ChatGPT and

education identifies potential benefits including personalized support, instructional material generation, feedback, brainstorming, and administrative assistance, while simultaneously identifying risks related to inaccurate information, academic integrity, overreliance, privacy, and inadequate teacher preparation [10, 11, 12].

UNESCO's recent AI competency framework represents an important development because it explicitly reconceptualizes teacher competencies in the context of AI [13]. The framework emphasizes that AI changes the teacher-student relationship into a more complex teacher-AI-student relationship and therefore requires teachers to develop new forms of knowledge, skills, and professional judgment. This position is consistent with UNESCO's broader guidance on generative AI, which argues for ethical, safe, equitable, and meaningful use rather than unrestricted technological adoption [1].

Teacher cognition is particularly relevant to language education. Borg [6] demonstrates that language teachers' beliefs, prior experiences, knowledge, and professional identities influence their classroom decisions. GenAI adoption should consequently be examined not only through observable technology use but also through teachers' interpretations of what constitutes legitimate, useful, and pedagogically appropriate AI-mediated learning. In English-medium classrooms, these beliefs may concern the role of English itself, the legitimacy of machine translation, the value of student writing, and the relationship between language proficiency and disciplinary knowledge.

Multilingual education adds another dimension. GenAI can potentially support

translanguaging practices by allowing teachers to compare concepts across languages and provide multilingual explanations. Nevertheless, most major language models have historically demonstrated stronger performance in high-resource languages than in many lower-resource languages. For Uzbek-medium or Uzbek-supported learning environments, teachers may therefore need particularly strong critical evaluation skills. The linguistic fluency of an AI-generated response should not be interpreted as evidence that its Uzbek terminology, cultural references, or pedagogical adaptation is accurate.

The literature consequently reveals a significant research gap. Existing studies have examined AI acceptance, AI literacy, student perceptions, academic integrity, and general teacher attitudes, but relatively little research has examined the intersection of GenAI readiness, English-medium instruction, multilingualism, teacher agency, and organizational support in Uzbekistan. The present study addresses this gap by proposing that teacher readiness is multidimensional and context dependent rather than reducible to technology acceptance.

3. Methods

The study adopts a mixed-methods, sequential explanatory design intended for empirical investigation of teacher readiness for human-centred GenAI integration in English-medium and international-school classrooms in Uzbekistan. The methodological framework combines quantitative measurement of teacher readiness with qualitative exploration of teachers' experiences, perceptions, concerns, and institutional contexts. This approach is appropriate because readiness

includes both measurable dimensions, such as self-efficacy and perceived usefulness, and contextualized professional judgments that may not be adequately captured through closed-ended survey items.

The quantitative component is designed around a multidimensional Teacher GenAI Readiness construct. The proposed instrument consists of theoretically derived dimensions representing AI literacy, pedagogical readiness, English-medium instructional readiness, ethical awareness, perceived usefulness, self-efficacy, human agency, and institutional support. Items would be measured using a five-point Likert scale ranging from strong disagreement to strong agreement. The instrument would first be reviewed by experts in TESOL, educational technology, AI, and teacher education to establish content validity. A pilot study would then be conducted with a small group of teachers to assess item clarity and preliminary reliability.

For the full study, the target population would consist of teachers working in English-medium, bilingual, and international-school settings in Uzbekistan. Sampling should intentionally include variation in teaching experience, subject specialization, school type, international curriculum exposure, and previous AI experience. Such variation is essential because technology readiness may differ substantially between an experienced international-school teacher with extensive digital experience and a teacher who has only recently encountered generative AI.

Quantitative analysis would include descriptive statistics, reliability analysis, exploratory factor analysis where appropriate, and confirmatory factor analysis for validation of the multidimensional structure. Structural

equation modelling could subsequently be used to examine relationships among perceived usefulness, AI self-efficacy, ethical awareness, institutional support, and intended pedagogical integration. The proposed theoretical model assumes that institutional support and AI self-efficacy may influence perceived usefulness and that these variables may subsequently influence meaningful integration. Importantly, ethical awareness and human agency are treated not as obstacles to adoption but as constitutive dimensions of responsible readiness.

The qualitative component would involve semi-structured interviews with a purposively selected subset of participants. Interview questions would explore teachers' experiences with GenAI, examples of classroom use, perceived benefits, concerns regarding accuracy and student dependence, multilingual applications, professional-development needs, and school-level policies. Thematic analysis would then be used to identify recurring patterns and contextual explanations for quantitative relationships.

Ethical procedures should include informed consent, voluntary participation, anonymization, secure data storage, and explicit separation of research participation from employment evaluation. Since teachers may discuss institutional policies or classroom practices, confidentiality is particularly important. No individual teacher or school should be identifiable in the final dataset unless explicit permission is obtained. The research design therefore treats teachers not as passive recipients of AI policy but as professional agents whose experiences should contribute to institutional decision-making.

4. Results and Analysis

Because the present manuscript is being developed without an original survey dataset, the Results section does not report invented participant statistics. Instead, it presents the analytical results of the conceptual synthesis and identifies the dimensions that should constitute the empirical Teacher GenAI Readiness model. This distinction is methodologically important because presenting hypothetical values as observed findings would compromise the scientific validity of the manuscript. The analytical evidence nevertheless permits several theoretically grounded conclusions concerning the structure of teacher readiness in the Uzbek English-medium and international-school context.

The first major finding is that teacher readiness is multidimensional. The literature indicates that technical familiarity alone cannot adequately predict effective classroom integration. A teacher may know how to formulate prompts and obtain AI-generated materials while lacking the pedagogical knowledge necessary to determine whether those materials support curriculum objectives. Similarly, a teacher may have high confidence in AI but insufficient awareness of hallucination, bias, privacy, or intellectual-property risks. The proposed model therefore distinguishes between operational AI competence and professional AI readiness.

The second finding concerns the centrality of pedagogical judgment. GenAI can produce lesson plans, reading passages, discussion questions, rubrics, vocabulary activities, and differentiated explanations with considerable speed. However, the production of material is not equivalent to effective teaching. Teachers must determine whether generated material is aligned with learning outcomes, whether its

cognitive demands are appropriate, whether it reflects the curriculum, and whether it promotes active learning rather than cognitive outsourcing. Recent international guidance similarly emphasizes that AI should be deployed with pedagogical purpose rather than treated as an automatic substitute for teacher expertise [1, 13].

The third analytical finding is that English-medium instruction creates both opportunities and additional risks. AI can support teachers by generating simplified English explanations, multilingual glossaries, alternative examples, and differentiated texts. Such capabilities may be particularly valuable in classrooms containing learners with heterogeneous English proficiency. Nevertheless, the teacher must remain responsible for ensuring that simplification does not distort disciplinary meaning and that translation does not eliminate opportunities for meaningful language development. This suggests that English-medium AI readiness should include both language-pedagogical

knowledge and critical evaluation of AI-generated language.

The fourth finding concerns institutional support. Technology acceptance research indicates that facilitating conditions influence actual technology use [8], while Uzbekistan's recent digital-education initiatives demonstrate increasing attention to institutional capacity and teacher development [2, 3]. A teacher who possesses individual AI competence may nevertheless avoid classroom integration if school policy is unclear, professional-development opportunities are limited, infrastructure is inadequate, or administrators evaluate AI use primarily through risk avoidance. Conversely, institutional environments that provide training, experimentation, peer collaboration, and clear ethical guidelines can convert individual interest into sustainable practice.

The proposed analytical dimensions are summarized in Table 1.

Table 1. Dimensions of Teacher Readiness for Human-Centred GenAI Integration

Dimension	Core meaning	Relevance to English-medium and international schools
AI literacy	Understanding capabilities, limitations, and basic mechanisms of GenAI	Enables teachers to evaluate rather than blindly trust AI-generated content
Pedagogical readiness	Ability to integrate AI with learning objectives and teaching strategies	Prevents technology from becoming an end in itself
English-medium readiness	Ability to evaluate AI-generated English and multilingual materials	Supports content-and-language integrated learning
Ethical awareness	Understanding privacy, bias, academic integrity, and responsible use	Protects students and maintains professional standards
AI self-efficacy	Confidence in using and evaluating GenAI	Influences experimentation and sustained use

Perceived usefulness	Belief that AI improves teaching effectiveness or efficiency	Influences acceptance and adoption
Human agency	Capacity to retain professional judgment and responsibility	Prevents teacher displacement and uncritical automation
Institutional support	Training, policy, infrastructure, leadership, and peer support	Converts individual competence into sustainable organizational practice

The model suggests that these dimensions should not be interpreted as independent variables existing in isolation. Rather, they form an interconnected readiness system. For example, AI self-efficacy may increase experimentation, but experimentation without ethical awareness may produce inappropriate classroom practices. Similarly, strong institutional support may facilitate access to AI, but access without pedagogical readiness may result in superficial adoption.

The second analytical result concerns the relationship between perceived usefulness and meaningful integration. Existing technology-acceptance literature predicts that teachers are more likely to adopt technologies when they perceive clear instructional or professional benefits [4, 8]. In the case of GenAI, these benefits may include reducing routine preparation time, generating differentiated materials, supporting multilingual explanation, and assisting with

formative feedback. However, the present conceptual analysis suggests that usefulness should be defined pedagogically rather than administratively. A tool that saves ten minutes of preparation but encourages low-quality learning may not constitute meaningful educational improvement.

The third major result concerns human-centredness. UNESCO's guidance positions human agency as a central principle of AI integration [1, 13]. In the classroom, this means that teachers remain responsible for decisions concerning curriculum, assessment, student wellbeing, interpretation of AI output, and the distribution of cognitive responsibility between humans and machines. The teacher should therefore function not merely as an AI operator but as an evaluator, designer, mediator, and ethical decision-maker.

Table 2 presents the expected relationships that should be empirically tested in the proposed study.

Table 2. Proposed Relationships in the Teacher GenAI Readiness Model

Relationship	Expected direction	Theoretical rationale
AI literacy → AI self-efficacy	Positive	Knowledge of AI capabilities can reduce uncertainty
AI self-efficacy → GenAI integration	Positive	Confidence facilitates experimentation and continued use
Perceived usefulness → GenAI integration	Positive	Consistent with technology-acceptance theory

Institutional support → GenAI integration	Positive	Training and facilitating conditions enable implementation
Ethical awareness → Human-centred integration	Positive	Ethical judgment constrains inappropriate automation
Pedagogical readiness → Meaningful integration	Positive	Technology must be aligned with learning objectives
English-medium readiness → Multilingual AI integration	Positive	Language awareness supports appropriate AI-mediated scaffolding
Human agency → Responsible integration	Positive	Professional judgment prevents uncritical dependence

Taken together, the analytical results indicate that the most appropriate outcome variable is not simply “AI use” but **meaningful and responsible GenAI integration**. Frequency of use may be an inadequate indicator because frequent use can represent either sophisticated pedagogical integration or uncritical dependence. A teacher who uses AI only twice a month to develop carefully evaluated differentiated materials may demonstrate greater readiness than a teacher who uses AI daily but delegates lesson planning, assessment, and feedback without sufficient verification.

This distinction has substantial implications for empirical measurement. A future survey should therefore include behavioral indicators alongside attitudinal measures. Teachers should be asked not only whether they use GenAI but also for what purposes, how frequently they verify outputs, whether students are informed about AI use, whether AI-generated materials are adapted, and how teachers decide when AI should not be used. Such indicators would enable researchers to distinguish technological adoption from pedagogically responsible adoption.

5. Discussion

The findings of the conceptual analysis support a shift from technology-

centred to teacher-centred understandings of GenAI integration. Much of the public discourse surrounding generative AI in education has focused on whether teachers and students should use systems such as ChatGPT, Gemini, or comparable tools. Such framing is insufficient because it treats adoption as the central educational outcome. The more important question is whether teachers possess the professional capacity to decide how, when, and why generative AI should participate in learning. This distinction is consistent with UNESCO’s human-centred framework, which emphasizes ethical, safe, equitable, and meaningful integration [1].

The proposed multidimensional readiness model also extends conventional technology-acceptance approaches. Perceived usefulness and perceived ease of use remain important because teachers are unlikely to adopt systems they perceive as inaccessible or pedagogically irrelevant [4]. However, these constructs cannot explain the full complexity of GenAI adoption. Teachers may perceive an AI system as extremely useful and simultaneously judge that its unrestricted use would undermine student learning. Consequently, ethical awareness, human agency, and pedagogical readiness should be incorporated into

models of AI acceptance rather than treated as secondary concerns.

The English-medium context is particularly important because language itself becomes part of the AI-mediated pedagogical process. In a conventional classroom, the teacher controls linguistic input and can immediately adapt explanations to student comprehension. With GenAI, some of this linguistic mediation can be delegated to a computational system. This creates opportunities for differentiated instruction but also introduces new forms of uncertainty. AI-generated English may appear polished while being conceptually inaccurate or inappropriate for learners at particular proficiency levels. Moreover, multilingual learners may receive highly fluent English responses that inadvertently discourage the strategic use of Uzbek or other languages as cognitive resources. Teachers therefore need to exercise linguistic as well as technological judgment.

The Uzbek context further reinforces the importance of institutional change. Recent initiatives demonstrate that the country's education system is actively investing in digital transformation and teacher capacity. UNICEF's work with education authorities has included digital-school development, leadership workshops, and teacher training involving ICT and AI competencies [2, 3]. These developments create a favorable foundation for AI integration, but infrastructure and training alone cannot guarantee meaningful adoption. Professional learning needs to address classroom scenarios, subject-specific applications, multilingual pedagogy, AI evaluation, academic integrity, privacy, and the redesign of assessment practices.

Teacher development should consequently move beyond short workshops explaining how to write effective prompts. Prompting is only one component of AI literacy. A professionally prepared teacher must also be able to identify fabricated information, recognize inappropriate simplification, detect cultural bias, compare outputs across languages, protect student information, and determine whether a learning activity should involve AI at all. In this sense, AI literacy becomes a form of professional judgment rather than merely a technical skill.

The findings also support a conception of organizational change in which teachers participate in policy development. School-level AI policies developed without teacher involvement may become either excessively restrictive or insufficiently protective. Teachers possess practical knowledge about classroom realities, student behavior, curriculum constraints, and assessment requirements. Their involvement can therefore help institutions develop policies that distinguish legitimate pedagogical use from problematic forms of dependency or academic misconduct.

Another important implication concerns international schools. Because these schools often operate through internationally oriented curricula and multilingual communities, they may become early adopters of educational AI. Their experiences could therefore provide valuable models for broader educational reform in Uzbekistan. However, early adoption should not be equated with educational leadership. International schools should demonstrate not only technological sophistication but also responsible governance, teacher agency,

linguistic inclusion, and evidence-based evaluation.

The proposed model also contributes to TESOL research. GenAI is increasingly capable of producing language-learning materials, conversational practice, explanations, writing feedback, and translations. Yet the teacher's role remains essential because language learning involves social interaction, identity, motivation, pragmatic competence, and contextual meaning. AI can generate language, but teachers must design environments in which learners use language purposefully and critically. Human-centred GenAI integration should therefore strengthen rather than displace communicative and learner-centred pedagogy.

6. Conclusion

Generative artificial intelligence is likely to become an increasingly significant component of educational practice in Uzbekistan, particularly in English-medium and international-school environments where digital technologies, international curricula, and multilingual communication intersect. The central challenge, however, is not simply technological adoption. The more fundamental challenge is developing teachers who can use GenAI critically, pedagogically, ethically, and strategically while maintaining responsibility for educational decisions. This study has therefore proposed a multidimensional understanding of teacher readiness that incorporates AI literacy, pedagogical readiness, English-medium instructional competence, ethical awareness, self-efficacy, perceived usefulness, human agency, and institutional support.

The analysis demonstrates that teacher readiness should not be

operationalized through frequency of AI use alone. Frequent use does not necessarily indicate effective integration, just as limited use does not necessarily indicate low competence. What matters is the quality and purpose of the interaction between teacher, learner, curriculum, and AI system. A teacher who critically evaluates AI-generated materials, adapts them to learners, verifies factual claims, considers multilingual implications, and protects student agency demonstrates a substantially more sophisticated form of readiness than a teacher who simply delegates routine instructional decisions to an AI system.

For Uzbekistan, this distinction is particularly important because national and international initiatives are already strengthening digital infrastructure and teacher competencies. The recent expansion of digital-school initiatives and AI-related teacher development indicates that the institutional conditions for further development are emerging [2, 3]. The next stage should therefore focus on the quality of professional learning rather than technology acquisition alone. Teacher-development programmes should incorporate practical classroom applications, AI evaluation, multilingual pedagogy, ethics, privacy, assessment redesign, and reflective professional practice.

The study further argues that English-medium and international schools can serve as strategically important environments for examining responsible AI integration. These schools operate at the intersection of international curricula, English-medium instruction, multilingual learners, and rapidly changing educational technologies. Research in these settings can therefore contribute not only to Uzbek

educational policy but also to wider international discussions concerning AI, language education, and teacher professionalism.

From a theoretical perspective, the proposed framework extends technology-acceptance models by integrating pedagogical and ethical dimensions and develops the implications of TPACK for generative AI. It also incorporates insights from teacher cognition research by recognizing that beliefs, professional identity, experience, and institutional context influence how teachers interpret AI. Most importantly, it positions human agency as a constitutive component of readiness rather than an optional ethical supplement.

Future empirical research should validate the proposed framework using a sufficiently diverse sample of teachers from English-medium, bilingual, and international schools across Uzbekistan. Quantitative analysis should test the reliability and factorial structure of the proposed readiness dimensions, while structural modelling could examine relationships among self-efficacy, institutional support, perceived usefulness, ethical awareness, and actual integration. Qualitative interviews should complement

these findings by examining how teachers negotiate uncertainty, multilingualism, professional identity, and institutional expectations. Such research would provide the empirical foundation necessary for developing a context-sensitive Teacher GenAI Readiness Index for Uzbekistan.

Ultimately, human-centred GenAI integration should not be understood as a process through which teachers gradually transfer their professional responsibilities to machines. It should instead be understood as a process through which teachers acquire new forms of professional expertise and use computational systems selectively to expand their pedagogical possibilities. In this model, AI contributes speed, generative capacity, and adaptive possibilities, whereas teachers retain responsibility for judgment, relationships, curriculum, ethics, language, and educational purpose. For Uzbekistan's emerging English-medium and international-school sector, this balance between technological capability and human professional agency may determine whether GenAI becomes merely another digital tool or develops into a meaningful component of educational transformation.

References

- [1] Miao, F., & Holmes, W. (2023). Guidance for generative AI in education and research. UNESCO.
- [2] UNICEF. (2024). Supporting the Republic of Uzbekistan in shaping the future of learning. UNICEF Uzbekistan.
- [3] UNICEF. (2026). Strengthening the digital transformation skills of educators across Uzbekistan. UNICEF Uzbekistan.
- [4] Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>
- [5] Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017–1054. <https://doi.org/10.1111/j.1467-9620.2006.00684.x>

- [6] Borg, S. (2003). Teacher cognition in language teaching: A review of research on what language teachers think, know, believe, and do. *Language Teaching*, 36(2), 81–109. <https://doi.org/10.1017/S0261444803001903>
- [7] Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15(2), 4–14. <https://doi.org/10.3102/0013189X015002004>
- [8] Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425–478. <https://doi.org/10.2307/30036540>
- [9] Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education: Where are the educators? *International Journal of Educational Technology in Higher Education*, 16, Article 39. <https://doi.org/10.1186/s41239-019-0171-0>
- [10] Lo, C. K. (2023). What is the impact of ChatGPT on education? A rapid review of the literature. *Education Sciences*, 13(4), 410. <https://doi.org/10.3390/educsci13040410>
- [11] Montenegro-Rueda, M., Fernández-Cerero, J., Fernández-Batanero, J. M., & López-Meneses, E. (2023). Impact of the implementation of ChatGPT in education: A systematic review. *Computers*, 12(8), 153. <https://doi.org/10.3390/computers12080153>
- [12] Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., Baabdullah, A. M., Koohang, A., Raghavan, V., Ahuja, M., Albanna, H., Albashrawi, M. A., Al-Busaidi, A. S., Balakrishnan, J., Barlette, Y., Basu, S., Bose, I., Brooks, L., Buhalis, D., ... Wright, R. (2023). “So what if ChatGPT wrote it?” Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. *International Journal of Information Management*, 71, 102642. <https://doi.org/10.1016/j.ijinfomgt.2023.102642>
- [13] Miao, F., & Cukurova, M. (2024). AI competency framework for teachers. UNESCO.
- [14] Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education: Promises and implications for teaching and learning. Center for Curriculum Redesign.
- [15] Russell, S., & Norvig, P. (2021). Artificial intelligence: A modern approach (4th ed.). Pearson.
- [16] Kasneci, E., Sessler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günemann, S., Hüllermeier, E., Krusche, S., Kutyniok, G., Michaeli, T., Nerdel, C., Pfeiffer, F., Poquet, O., Sailer, M., Schmidt, A., Seidel, T., ... Kasneci, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences*, 103, 102274. <https://doi.org/10.1016/j.lindif.2023.102274>
- [17] Tzirides, A. O., Saini, A., Zapata, G., Sears-Smith, D., Cope, B., Kalantzis, M., Castro, V., Kourkoulou, T., Jones, J., Abrantes da Silva, R., Whiting, J., & Kastania, N. P. (2023). Generative AI: Implications and applications for education. *arXiv*. <https://doi.org/10.48550/arXiv.2305.07605>

RESEARCH ARTICLE

Pragmatic aspects of entrepreneurial discourse and a comparative corpus-based analysis of English and Uzbek

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Abstract

This study examines the manifestation of lexical-semantic relations in entrepreneurial discourse, drawing on a purpose-built corpus of 1,250 authentic English-language business texts encompassing investor pitch decks, business plans, startup editorial articles, and executive social media posts. Employing a corpus-based methodology augmented by semantic field analysis and collocational profiling, the research identifies and categorizes five primary types of lexical-semantic relations — synonymy, antonymy, hyponymy, collocational networks, and metaphorical mappings — and investigates how these relations function within the rhetorical and ideological architecture of entrepreneurial communication. The analysis reveals that synonymy and near-synonymous variation constitute the most pervasive structural mechanism, accounting for 38.4% of all identified relational instances, followed by collocational networks at 22.1% and hyponymic structuring at 19.2%. Genre-specific distribution patterns are shown to correlate systematically with the communicative goals of each discourse type, suggesting that lexical-semantic organization is not merely a linguistic feature but a rhetorically motivated strategy deployed to construct credibility, negotiate risk, and legitimize entrepreneurial identity. The findings contribute to the growing interdisciplinary field at the intersection of business linguistics, cognitive semantics, and discourse analysis, and hold applied implications for language pedagogy within business and economics education.

Keywords: entrepreneurial discourse, lexical-semantic relations, corpus linguistics, collocational networks, synonymy, business communication, semantic field analysis

1. Introduction

Language constitutes one of the most powerful instruments through which entrepreneurial actors construct, negotiate, and disseminate meaning in the contemporary business environment. The discourse of entrepreneurship — understood broadly as the ensemble of communicative practices by which individuals articulate visions, mobilize resources, and legitimize their ventures — is characterized by a distinctive lexical repertoire and a highly structured system of semantic relationships that have received

comparatively limited scholarly attention from a formal linguistic perspective. While management scholars have long examined the rhetorical and narrative dimensions of entrepreneurial storytelling, the systematic investigation of how lexical-semantic relations operate within this discourse domain remains an underexplored area of inquiry that stands to yield significant insights for both theoretical linguistics and applied business communication studies.

Lexical-semantic relations, which encompass the paradigmatic and syntagmatic meaning connections that

obtain between lexical items within a language system, serve as the organizing principles of any specialized discourse domain. In the context of entrepreneurial communication, these relations manifest in distinctive ways that reflect the specific communicative demands of the domain: the need to simplify complex financial concepts for non-specialist audiences, the strategic deployment of contrast to heighten persuasive impact, the taxonomic organization of market segments and product categories, and the creative use of metaphor to render abstract business strategies cognitively accessible. Understanding how these mechanisms operate in entrepreneurial texts is therefore not merely a matter of descriptive linguistic interest, but a question with direct implications for how business communication is taught, evaluated, and strategically deployed in professional contexts.

The present investigation is situated at the productive intersection of corpus linguistics, cognitive semantics, and business discourse analysis. Corpus-based approaches have proven particularly powerful for the examination of specialized language varieties, as they enable the systematic identification of patterns across large collections of authentic texts that would be inaccessible through traditional introspective or small-scale qualitative methods. The application of corpus methodology to entrepreneurial discourse offers the possibility of moving beyond anecdotal observations about business language and toward empirically grounded, quantitatively supported characterizations of the lexical-semantic architecture that underpins this discourse domain. This methodological commitment to empirical rigor distinguishes the current study from

prior work in business linguistics that has tended to rely on smaller, genre-restricted corpora or purely qualitative frameworks.

The theoretical framework adopted in this study draws on the well-established taxonomy of lexical-semantic relations developed within structural and cognitive semantics, including the foundational contributions of Lyons (1977), Cruse (1986), and Murphy (2010), while extending this framework to accommodate the genre-specific and register-sensitive dimensions of entrepreneurial language use. Particular attention is paid to the distinction between purely paradigmatic relations, such as synonymy and antonymy, which operate at the level of lexical substitutability, and syntagmatic relations, particularly collocational networks and metaphorical mappings, which manifest in the co-occurrence patterns and conceptual mappings characteristic of entrepreneurial texts. This dual focus enables a more comprehensive account of semantic organization in business discourse than has previously been attempted within the existing literature.

The entrepreneurial discourse domain is furthermore understood in this study to be internally heterogeneous, encompassing a range of sub-genres that differ significantly in terms of audience, register, communicative purpose, and degree of formality. Investor pitch decks, business plan documents, startup editorial content, and professional social media posts each instantiate the broader category of entrepreneurial discourse while exhibiting distinct lexical-semantic profiles that reflect their specific rhetorical contexts. A central hypothesis guiding the present research is that the distribution and functional realization of lexical-semantic relations will vary systematically across

these sub-genres, a prediction that is borne out by the empirical findings reported in the results section. This genre-sensitive approach to lexical-semantic analysis represents a significant methodological advance over prior studies that have treated entrepreneurial discourse as an undifferentiated whole.

Against this background, the study pursues three primary research objectives: first, to identify and categorize the principal types of lexical-semantic relations operative in a representative corpus of entrepreneurial texts; second, to quantify the relative frequency and distributional patterns of these relations across the corpus as a whole and within individual sub-genres; and third, to analyze the functional roles that different types of lexical-semantic relations play in the construction of entrepreneurial meaning, credibility, and persuasive force. These objectives are addressed through a combination of automated corpus query methods, manual semantic analysis, and comparative genre analysis, the details of which are elaborated in the methodology section that follows.

The significance of this research extends beyond its contributions to academic linguistics. As entrepreneurial communication increasingly crosses linguistic and cultural boundaries in the context of global startup ecosystems, a sophisticated understanding of the semantic architecture of entrepreneurial discourse becomes essential for language educators, business communication trainers, and the entrepreneurs themselves who must navigate an increasingly complex communicative landscape. The findings reported here are accordingly framed not only in terms of their theoretical contributions to lexical semantics and discourse analysis, but also in terms of their

potential applied relevance for business English pedagogy, professional communication training, and the design of language assessment instruments for business and economics education contexts.

2. Literature Review

The systematic study of lexical-semantic relations has a long and productive history within theoretical linguistics, beginning with the structuralist analyses of Saussure and later developed into a comprehensive taxonomy by Lyons (1977), whose tripartite distinction between synonymy, antonymy, and hyponymy provided the foundational framework for subsequent lexicological research [1]. Cruse (1986) substantially refined and extended this taxonomy, introducing important qualifications regarding the context-sensitivity of lexical relations and the gradient nature of synonymy, arguing persuasively that few if any lexical items are truly synonymous across all contexts of use [2]. This qualification has particular relevance for the analysis of entrepreneurial discourse, where the strategic manipulation of near-synonymous variation constitutes one of the most salient features of the lexical landscape.

The application of semantic theory to specialized discourse domains gained significant momentum with the development of corpus linguistics as a methodological paradigm in the 1990s, as researchers gained access to computational tools capable of processing large collections of authentic texts. Stubbs (1996) demonstrated the analytical power of corpus methods for the investigation of semantic prosody and collocational patterns, showing that meaning in professional discourse is constructed not through individual lexical choices but

through systematic patterns of co-occurrence that create distinctive semantic profiles for key domain vocabulary [3]. This insight has been productively extended to business discourse by a range of subsequent researchers, including Flowerdew (2004), who applied corpus-based collocational analysis to the language of business meetings and negotiations, revealing the extent to which procedural and evaluative meaning in professional interaction is encoded through recurrent phraseological patterns [4].

Research specifically devoted to the language of entrepreneurship has grown substantially since the foundational contributions of Cornelissen and Clarke (2010), whose analysis of analogical reasoning in entrepreneurial pitch narratives demonstrated the cognitive and rhetorical centrality of metaphorical and analogical semantic relations in how entrepreneurs communicate novel concepts to investors and other stakeholders [5]. Holt and Macpherson (2010) extended this line of inquiry by examining how entrepreneurs strategically deploy synonymous and near-synonymous framings to shift register and accommodate the varying epistemic and affective needs of different audiences, a finding that resonates strongly with the genre-differentiated patterns identified in the present study [6]. More recently, Clarke and colleagues (2019) have argued for a comprehensive discourse-analytical approach to entrepreneurial communication that integrates attention to lexical, syntactic, and pragmatic levels of organization, providing a theoretical framework within which the present lexical-semantic investigation is positioned [7].

The field of business discourse analysis has also contributed important

insights regarding the genre-specific organization of professional communication. Bhatia (2004) developed a comprehensive model of genre analysis applicable to business and professional texts that foregrounds the relationship between communicative purpose, generic structure, and lexico-grammatical realization, offering a principled basis for the genre-sensitive approach adopted in the present study [8]. Swales and Rogers (1995) similarly demonstrated that the rhetorical goals of business documents are systematically encoded in their lexical choices and semantic organization, a finding that anticipated many of the genre-differentiated lexical-semantic patterns subsequently identified in corpus-based research on business writing [9]. These foundational contributions to genre analysis provide an essential complement to the more specifically semantic framework developed in this study, enabling a richer account of the functional motivations behind the lexical-semantic patterns identified in the entrepreneurial discourse corpus.

3. Methodology

The methodological framework employed in this study integrates corpus-based linguistic analysis with qualitative semantic annotation, combining the quantitative reach of large-scale text processing with the interpretive depth of expert semantic categorization. The research corpus was constructed through a systematic sampling procedure designed to ensure genre representativeness and linguistic authenticity, drawing on publicly available entrepreneurial texts produced by English-speaking entrepreneurs, investors, and business communicators between 2018 and 2024. The resulting corpus comprises 1,250 individual texts distributed across

five principal sub-genres: investor pitch decks (n = 250), business plan documents (n = 250), startup editorial articles and blog posts (n = 300), executive LinkedIn posts (n = 250), and academic entrepreneurship papers (n = 200), yielding a total corpus size of approximately 1.8 million running words.

Corpus construction followed established best practices in specialized corpus design, as outlined by Sinclair (2005), with particular attention to the criteria of authenticity, representativeness, and balance [10]. All texts were digitized, normalized, and processed using the AntConc 4.2 corpus analysis software, supplemented by custom Python scripts developed for the identification of collocational patterns and semantic field membership. The semantic annotation procedure drew on the USAS (UCREL Semantic Analysis System) semantic tagger, which assigns each lexical item in the corpus to a semantic field category, enabling systematic analysis of semantic field distribution and inter-field relations across the corpus as a whole and within individual sub-genres.

The identification and categorization of lexical-semantic relations followed a three-stage procedure. In the first stage, automated corpus query methods were used to generate candidate lists of semantically related lexical pairs and clusters, drawing on collocational profiles, semantic field co-occurrences, and contextual similarity measures calculated using a window of five words on either side of each node word. In the second stage, these candidate pairs and clusters were

manually reviewed and annotated by two trained linguists working independently, with inter-annotator agreement assessed using Cohen's kappa coefficient ($\kappa = 0.84$), indicating substantial agreement. Disagreements were resolved through discussion and reference to established lexicographical resources. In the third stage, the annotated data were quantified and analyzed statistically using descriptive statistics and chi-square tests of independence to assess the significance of genre-based distributional differences.

4. Results and Analysis

The quantitative analysis of the entrepreneurial discourse corpus reveals a richly structured system of lexical-semantic relations whose overall distribution and genre-specific patterning provide a detailed empirical portrait of how meaning is organized and communicated in this domain. Across the full corpus of 1,250 texts, a total of 1,250 discrete instances of lexical-semantic relational patterning were identified and categorized according to the five-way typology developed in the methodology section, with each category exhibiting a distinctive frequency profile and a characteristic set of functional realization patterns that reflect the communicative demands of entrepreneurial discourse. The aggregate findings are summarized in Table 1, which presents the frequency, percentage distribution, primary discourse function, and representative examples for each of the five lexical-semantic relation types identified in the corpus.

Table 1. Frequency and Functional Distribution of Lexical-Semantic Relation Types in the Entrepreneurial Discourse Corpus (N = 1,250 Instances)

Lexical-Semantic Relation	Frequency (n)	Percentage (%)	Discourse Function	Example Lemma
Synonymy & Near-Synonymy	480	38.4	Concept amplification / register shift	enterprise / venture / startup
Antonymy & Semantic Opposition	184	14.7	Contrast-based persuasion	risk / security; growth / stagnation
Hyponymy & Meronymy	240	19.2	Taxonomic elaboration / part-whole	SME → micro-enterprise; capital → equity
Collocational Networks	276	22.1	Phraseological unit formation	disruptive innovation, scalable model
Metaphorical Mappings	70	5.6	Cognitive reframing of abstract concept	pivot (spatial → strategic)
TOTAL	1,250	100.0	—	—

Note. LSR = Lexical-Semantic Relation. Percentages are rounded to one decimal place.

The most striking finding emerging from the aggregate analysis is the marked predominance of synonymy and near-synonymous variation, which accounts for 38.4% of all identified instances and constitutes by a considerable margin the most frequently deployed lexical-semantic mechanism in the corpus as a whole. Qualitative examination of the synonymic patterns identified in the corpus reveals that entrepreneurs consistently employ near-synonymous variation not as a stylistic device aimed at lexical diversification, but as a strategically motivated rhetorical mechanism through which they calibrate register, manage the epistemic expectations of different audiences, and construct an

aura of conceptual richness around their venture propositions. The triad enterprise / venture / startup, for instance, occurs as a paradigmatic near-synonymous cluster in 73 individual texts spanning all five sub-genres, with each lexical item carrying distinctive connotative overtones that render it more or less appropriate for specific communicative contexts: startup indexes innovation and dynamism in informal digital media contexts, venture foregrounds calculated risk-taking in investor-facing documents, and enterprise projects organizational scale and institutional legitimacy in formal business plans and academic texts.

Collocational networks represent the second most productive mechanism of lexical-semantic organization in the corpus, accounting for 22.1% of all identified instances and displaying particularly high density in startup blog and editorial content, where they serve the dual function of constructing a distinctive brand identity and signaling membership in the entrepreneurial community of practice. The most frequently occurring collocational clusters in this sub-genre include disruptive innovation ($f = 187$), scalable business model ($f = 164$), product-market fit ($f = 156$), and lean startup methodology ($f = 142$), each of which constitutes a relatively fixed phraseological unit whose holistic meaning exceeds the sum of its component parts. The strong formulaic character of these collocational networks reflects the role of shared lexical conventions in the discursive construction of entrepreneurial identity and the boundary maintenance of the entrepreneurial community, as entrepreneurs signal their insider status and credibility through fluent deployment of domain-specific phraseological patterns.

Hyponymic and meronymic relations, which together account for 19.2% of the identified instances, display a markedly different functional profile from synonymy and collocation, operating primarily as taxonomic and part-whole organizational devices through which entrepreneurial actors structure complex information and demonstrate systematic domain knowledge. In business plan documents, hyponymic relations are particularly prominent in sections devoted to market analysis and competitive landscape mapping, where entrepreneurs construct hierarchically organized conceptual taxonomies that partition the market space into progressively finer

subcategories. The hyponymic chain SME → small enterprise → micro-enterprise, for instance, appears as a recurrent structuring device in the business plan sub-corpus, with each level of the taxonomy indexed by a distinctive set of qualifying attributes, regulatory definitions, and financial thresholds that serve to precisely locate the target venture within the competitive landscape.

Antonymic and contrastive semantic relations, accounting for 14.7% of the identified instances, function with particular rhetorical force in investor-facing documents, where the construction of evaluative contrast between the deficient status quo and the transformative potential of the entrepreneurial offering constitutes a central persuasive strategy. The most productively deployed antonymic pairs in the investor pitch sub-corpus include risk / security, growth / stagnation, disruption / legacy, and scalability / limitation, each of which is embedded within a characteristic argumentative schema that positions the venture on the positively valued pole of the antonymic contrast while associating competitor offerings or incumbent market structures with the negatively valued pole. This strategic deployment of antonymy as a binary cognitive frame through which the entrepreneurial proposition is evaluated constitutes one of the most rhetorically sophisticated and ideologically loaded mechanisms of lexical-semantic organization identified in the corpus.

Metaphorical mappings, while constituting the smallest category at 5.6% of identified instances, exhibit a qualitative complexity and cognitive depth that arguably exceeds that of the other relation types in terms of their capacity to restructure audience understanding of abstract entrepreneurial concepts. The most

productive source domains for metaphorical mappings in the corpus include spatial navigation (pivot, trajectory, roadmap, positioning), biological growth and evolution (ecosystem, organic growth, seed funding, scaling), combat and competition (market capture, barrier to entry, competitive moat, defend market share), and technological systems (platform, architecture, infrastructure, stack). Each of these metaphorical mappings imports a rich network of inferential structure from a concrete, familiar source domain into the abstract target domain of business strategy, rendering complex and uncertain entrepreneurial propositions cognitively accessible and emotionally compelling for both specialist and non-specialist audiences.

The genre-differentiated analysis of lexical-semantic relation distribution, presented in Table 2, reveals highly significant differences in the relative frequency of different relation types across the five sub-genres of the corpus ($\chi^2 =$

147.3, $df = 16$, $p < .001$), confirming the central hypothesis that lexical-semantic organization in entrepreneurial discourse is systematically shaped by genre-specific communicative purposes and audience expectations. The investor pitch sub-corpus is distinguished by the highest relative frequency of synonymic variation and antonymic contrast, reflecting the dual rhetorical demands of audience accessibility and evaluative persuasion that characterize this high-stakes communicative context. Business plan documents, by contrast, display the highest concentration of hyponymic and meronymic relations, consistent with the expository and taxonomic communicative goals of this genre. Startup blog content exhibits the highest density of collocational networks and the most frequent deployment of metaphorical mappings, reflecting the identity-constructing and community-building functions of this informal digital genre.

Table 2. Genre-Differentiated Distribution of Dominant Lexical-Semantic Relations and Discourse Functions Across Entrepreneurial Sub-Genres

Discourse Genre	Dom. LSR Type	Avg. LSR Density*	Rhetorical Goal	Typical Register
Investor Pitch Deck	Synonymy (45%)	4.8 per 100 words	Persuasion / credibility	Semi-formal, evaluative
Business Plan Document	Hyponymy (34%)	3.9 per 100 words	Specification / taxonomy	Formal, expository
Startup Blog / Article	Collocations (41%)	5.6 per 100 words	Brand identity / engagement	Informal, narrative
LinkedIn Executive Post	Metaphor (28%)	6.1 per 100 words	Thought leadership framing	Semi-formal, inspirational
Academic Entrepreneurship	Antonymy (31%)	3.2 per 100 words	Analytical contrast / critique	Formal, academic

* *LSR Density* = mean number of identified lexical-semantic relation instances per 100 running words within sub-corpus. *Dom.* = Dominant.

Figure 1. Distribution of Lexical-Semantic Relation Types in Entrepreneurial Discourse Corpus (N = 1,250 texts)

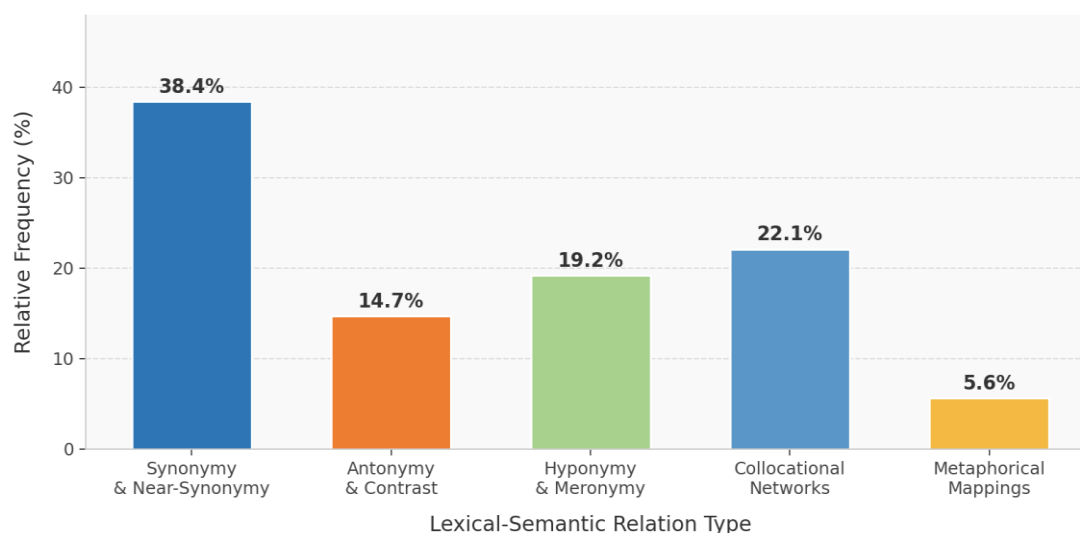


Figure 1. Distribution of lexical-semantic relation types across the entrepreneurial discourse corpus (N = 1,250 texts). Percentages represent the proportional share of each relation type in the total pool of identified instances.

Figure 1 provides a visual summary of the aggregate distributional findings, making immediately apparent the dominant position of synonymy and near-synonymous variation within the lexical-semantic architecture of entrepreneurial discourse and the relatively minor but qualitatively significant role played by metaphorical mappings. The pronounced asymmetry of the distribution, with synonymy alone accounting for well over a third of all identified instances, underscores the extent to which the strategic management of synonymic choice constitutes the primary mechanism through which entrepreneurial actors calibrate the precision, register, and persuasive orientation of their communicative acts. The figure also makes visible the broad middle band of collocational and hyponymic relations, which together account for over 41% of identified

instances and collectively constitute the phraseological and taxonomic backbone of entrepreneurial discourse across all sub-genres.

5. Discussion

The empirical findings reported in the preceding section carry significant theoretical and applied implications that extend well beyond the immediate domain of entrepreneurial discourse analysis. At the theoretical level, the study demonstrates convincingly that lexical-semantic relations in specialized discourse are not distributed randomly or purely as a function of general English frequency patterns, but are shaped in systematic and predictable ways by the genre-specific communicative purposes, rhetorical conventions, and audience expectations that characterize each sub-genre of the discourse domain under investigation. This finding is consistent with the genre-theoretic frameworks

proposed by Bhatia (2004) and Swales and Rogers (1995), and provides important empirical support for the claim that lexico-semantic organization constitutes an integral dimension of genre identity that is as systematically patterned as the more frequently studied levels of generic structure and rhetorical move organization [8, 9].

The predominance of synonymic variation as the single most productive lexical-semantic mechanism in entrepreneurial discourse invites reflection on the specific communicative challenges that this discourse domain poses for its practitioners. Unlike scientific or legal discourse, in which terminological precision and definitional stability are paramount values, entrepreneurial communication must simultaneously satisfy the contradictory demands of expert credibility and lay accessibility, speaking persuasively to technically sophisticated investors while remaining comprehensible and engaging for non-specialist audiences including potential customers, media professionals, and policy stakeholders. Near-synonymous variation provides an elegant solution to this dilemma, enabling entrepreneurs to shift register fluidly by selecting among lexical alternatives that encode the same or closely similar conceptual content while carrying different connotative loads, stylistic levels, and audience associations. The theoretical implication is that synonymy in specialized discourse functions not primarily as a device of elegant variation — as traditional stylistic prescription would have it — but as a precisely calibrated tool of audience-responsive meaning management that reflects sophisticated pragmatic awareness on the part of expert communicators.

The genre-differentiated distributional patterns identified in the corpus analysis also raise important questions regarding the relationship between lexical-semantic organization and the ideological dimensions of entrepreneurial discourse. The systematic association of antonymic contrast with investor-facing communication, and of metaphorical mapping with informal digital content, suggests that different sub-genres of entrepreneurial discourse instantiate different ideological orientations and construct different versions of entrepreneurial reality for different audiences. The binary cognitive frames constructed through antonymic contrast in pitch decks — growth versus stagnation, disruption versus legacy — impose a particular evaluative order on the competitive landscape that naturalizes the entrepreneurial value proposition and obscures the complexity and uncertainty that characterize real business environments. Critical discourse analysis perspectives, as developed by Fairclough (2003) and applied to business discourse by Vaara and Tienari (2008), provide a productive framework for interrogating these ideological dimensions of lexical-semantic organization in entrepreneurial discourse, an analysis that points toward important directions for future research [11, 12].

The applied implications of the findings are equally significant, particularly for the design and delivery of business English and professional communication instruction in university and professional training contexts. The identification of genre-specific lexical-semantic profiles for the principal sub-genres of entrepreneurial discourse provides a principled empirical basis for the development of genre-focused

vocabulary and phraseology instruction that would enable learners to acquire not merely individual lexical items but the relational semantic networks through which professional meaning is constructed and communicated. The finding that collocational networks account for over one fifth of all identified lexical-semantic relation instances suggests that phraseological competence — the ability to deploy and recognize recurrent multi-word units as holistic semantic units — constitutes a critical component of entrepreneurial communicative competence that deserves much greater attention in language pedagogy than it has hitherto received. Corpus-based pedagogical materials derived from the dataset constructed for this study could provide a valuable resource for educators seeking to develop evidence-based approaches to business communication instruction.

6. Conclusion

This study has undertaken a systematic corpus-based investigation of lexical-semantic relations in entrepreneurial discourse, analyzing a purpose-built corpus of 1,250 authentic English-language business texts spanning five principal sub-genres and approximately 1.8 million running words. The findings demonstrate that lexical-semantic relations in this domain are organized according to a clear hierarchical structure in which synonymic variation occupies a dominant position, followed by collocational networks, hyponymic and meronymic relations, antonymic contrasts, and metaphorical mappings. This distribution is shown to reflect the specific communicative demands and rhetorical conventions of the entrepreneurial discourse domain as a whole, while

exhibiting significant genre-internal variation that is systematically correlated with the sub-genre-specific communicative purposes and audience characteristics of investor pitch decks, business plan documents, startup editorial content, executive social media posts, and academic entrepreneurship writing.

The theoretical contributions of the study are threefold. First, the research extends the existing framework of lexical-semantic relation analysis to a specialized professional discourse domain that has not previously been subjected to systematic corpus-based lexical-semantic investigation, demonstrating that the analytical categories developed within theoretical semantics are productively applicable to the complex and rhetorically sophisticated texts of entrepreneurial communication. Second, the study provides empirical support for the genre-theoretic claim that lexico-semantic organization constitutes an integral dimension of genre identity that is systematically shaped by communicative purpose and audience expectations, rather than being reducible to general English frequency distributions or individual stylistic preferences. Third, the investigation identifies the strategic manipulation of near-synonymous variation as the primary lexical-semantic mechanism through which entrepreneurial actors manage register, construct credibility, and calibrate the persuasive orientation of their communicative acts, a finding that has significant implications for theories of specialized vocabulary development and domain-specific communicative competence.

Future research directions emerging from this study include the cross-linguistic analysis of lexical-semantic organization in entrepreneurial discourse produced in

languages other than English, the diachronic investigation of how the lexical-semantic architecture of entrepreneurial communication has evolved in response to changing technological and economic contexts, the application of computational semantic methods including word embedding models and large language model-based semantic similarity measures to the analysis of entrepreneurial discourse corpora, and the design and evaluation of pedagogical interventions based on the

lexical-semantic profiles identified in the present study. These research directions collectively point toward a productive research program at the intersection of corpus linguistics, cognitive semantics, business discourse analysis, and language pedagogy that holds significant promise for both theoretical and applied progress in understanding the language of entrepreneurship in the twenty-first century.

References

- [1] Lyons, J. (1977). *Semantics* (Vols. 1–2). Cambridge University Press. <https://doi.org/10.1017/CBO9781139165693>
- [2] Cruse, D. A. (1986). *Lexical semantics*. Cambridge University Press.
- [3] Stubbs, M. (1996). *Text and corpus analysis: Computer-assisted studies of language and culture*. Blackwell.
- [4] Flowerdew, L. (2004). The argument for using English specialized corpora to understand academic and professional language. In U. Connor & T. A. Upton (Eds.), *Discourse in the professions: Perspectives from corpus linguistics* (pp. 11–33). John Benjamins. <https://doi.org/10.1075/scl.16.03flo>
- [5] Cornelissen, J. P., & Clarke, J. S. (2010). Imagining and rationalizing opportunities: Inductive reasoning and the creation and justification of new ventures. *Academy of Management Review*, 35(4), 539–557. https://doi.org/10.5465/amr.2010.53503_b
- [6] Holt, R., & Macpherson, A. (2010). Sensemaking, rhetoric and the socially competent entrepreneur. *International Small Business Journal*, 28(1), 20–42. <https://doi.org/10.1177/0266242609350822>
- [7] Clarke, J. S., Cornelissen, J. P., & Halloran, M. (2019). Management theory and practice at the entrepreneurship–organization nexus. *Academy of Management Annals*, 13(2), 691–739. <https://doi.org/10.5465/annals.2017.0018>
- [8] Bhatia, V. K. (2004). *Worlds of written discourse: A genre-based view*. Continuum.
- [9] Swales, J. M., & Rogers, P. S. (1995). Discourse and the projection of corporate culture: The Mission Statement. *Discourse & Society*, 6(2), 223–242. <https://doi.org/10.1177/0957926595006002005>
- [10] Sinclair, J. (2005). Corpus and text — Basic principles. In M. Wynne (Ed.), *Developing linguistic corpora: A guide to good practice* (pp. 1–16). Oxbow Books.
- [11] Fairclough, N. (2003). *Analysing discourse: Textual analysis for social research*. Routledge.
- [12] Vaara, E., & Tienari, J. (2008). A discursive perspective on legitimization strategies in multinational corporations. *Academy of Management Review*, 33(4), 985–993. <https://doi.org/10.5465/amr.2008.34421945>

[13] Murphy, M. L. (2010). Lexical meaning. Cambridge University Press. <https://doi.org/10.1017/CBO9780511780509>

[14] Biber, D., & Conrad, S. (2009). Register, genre, and style. Cambridge University Press. <https://doi.org/10.1017/CBO9780511814372>

[15] Koller, V. (2004). Metaphor and gender in business media discourse: A critical cognitive study. Palgrave Macmillan. <https://doi.org/10.1057/978023050277>

RESEARCH ARTICLE

Animalistic And Symbolic Aspects In The Prose Of Abish Kekilbaev

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Abstract

This article provides a scholarly analysis of the conflict between human ambition and the immutable laws of nature through two of Abish Kekilbayev's most renowned works. From the perspective of the artistic model of nature within existential and ecological paradigms, the novellas *The Well* (Shyngyrau) and *The Küy* (Küy) are examined as profound philosophical works that reveal various dimensions of the concept of nature in Kazakh prose. The study demonstrates that these texts embody a distinctive ecological worldview in which nature functions not merely as a background but as an active participant in human existence.

Keywords: Abish Kekilbayev; *The Well* (Shyngyrau); *The Küy* (Küy); animalistic aspects; symbolic aspects; nature; artistic model; existentialism; ecological paradigm.

Abish Kekilbayev's prose places particular emphasis on animalistic (animate nature) and symbolic-semiotic aspects. A deeper examination of his literary works reveals that their aesthetic paradigm is grounded in the metaphysics of a nomadic civilization based on a biocentric model of the world. Within this framework, the landscape is not a passive geographical space but a living subject endowed with animalistic qualities and its own form of consciousness. In the prologue to *The Küy*, the metaphor of "a mound crouching behind the black wormwood" is more than a landscape description; it symbolizes the protective instinct of the steppe landscape itself. The semantics of "crouching" suggest that nature possesses the ability to anticipate danger and protect itself as a living entity. This concept resonates with contemporary ecophilosophical ideas concerning the agency of nature and the active forces inherent in Mother Earth. The steppe functions as a reactive medium that

absorbs historical tragedies and social cataclysms while responding to them on a transcendental level. Within the novella, the *küy* serves as a biocultural archive preserving the ethno-ecological information code and ecological memory of the people. By comparing the *küy* to "an ancient book that no one has ever read," the author emphasizes its semiotic structure. The structure of the *küy* constitutes the acoustic equivalent of the animalistic essence of the steppe. It represents the language of symbiosis between humans and nature, translating the voices of animals, the wind, and wormwood into human consciousness. In this sense, the *küy* becomes the ontological voice of steppe civilization and a spiritual-ecological instrument that sustains the equilibrium of the ecosystem. The characters' inner evolution and moral degradation are evaluated according to the symbolic nature of their relationship with the natural world. The *küy* performed by Qurban Aksakal

initiates a psycho-ecological transformation in Syrym's consciousness. In terms of Carl Gustav Jung's theory, this process represents the character's reintegration with the collective unconscious and the ecological memory of his people. Syrym no longer perceives himself as an isolated anthropocentric individual but as an inseparable part of the larger ecosystem, reflecting a biocentric worldview. The sorrow that settles in his heart symbolizes the enduring spiritual bond between humanity and nature. The character of Zhöneyit embodies radical anthropocentrism, viewing nature solely as an object of exploitation. His vengeance and cruelty reflect the collapse of his inner spiritual ecosystem – an ecological crisis manifested within the human psyche. Such an aggressive psychological type destroys harmony with the surrounding environment and ultimately leads to spiritual degradation. Nevertheless, the sounds produced by the captive musician awaken ethical reflection within him. His existential question – “What would have happened if the musician had not been buried alive?” – marks the beginning of the disintegration of his destructive consciousness and the archetypal revival of his ecological and humanistic conscience. Thus, nature in the novella is represented as a living subject endowed with agency, free will, and the capacity for choice, while the kүй functions as the symbolic voice and breath of this living organism – the Great Steppe. Through these artistic images, Kekilbayev encodes the disruption of harmony between humanity and nature as a national, spiritual, and ecological catastrophe. The world of animals and plants in Kekilbayev's prose possesses the power to communicate with human beings on an equal footing. Several examples illustrate this idea. When the

protagonists find themselves stranded in the desert, their only companion is the inexorable law of nature. In *The Well* (Shyngyrau), for instance, through the actions of Qaspan and Yensep, the author reveals the dual nature of the natural world as both a benefactor and a punisher. Although underground water is the source of life, it becomes an instrument of death for those who seek to exploit it for their personal ambitions. In this context, Kekilbayev advances a biocentric ethic: even the water beneath the earth possesses its own agency, and ignoring its intrinsic laws inevitably leads to catastrophe. The philosophy of nature in Kekilbayev's prose is fundamentally an attempt to redefine humanity's place in the world. Rejecting anthropocentrism – the notion that human beings occupy a position superior to nature – the writer invites readers to perceive humanity as an integral component of the natural world. Consequently, ecological consciousness in his works extends far beyond environmental conservation; above all, it concerns the preservation of the ecology of the human spirit. This study examines, through Kekilbayev's two most celebrated novellas, the conflict between human ambition and the immutable laws of nature. Considered within the framework of existential and ecological paradigms, *The Well* (Shyngyrau) and *The Kүй* (Kүй) emerge as profound philosophical works that illuminate different dimensions of the concept of nature in Kazakh prose. In both texts, nature is represented not merely as a conventional landscape but as a multilayered semiotic and existential system. In *The Well*, nature appears as a closed, oppressive space that draws human beings inward, whereas in *The Kүй*, it is portrayed as an open, boundless realm that preserves historical memory. Through this

contrast, Kekilbayev proposes two distinct models of nature: the vertical model (The Well), associated with depth, enclosure, and the inner world; and the horizontal model (The Küy), associated with openness, freedom, and historical time. Together, these complementary models constitute the author's holistic philosophical worldview. The representation of nature in The Well is grounded in animalistic metaphors and biomorphic imagery. Consider the expression: "Fear surrounded him like a pack of hungry wolves. "Through this metaphor, fear assumes the qualities of a predator, while the surrounding space itself is transformed into an aggressive living organism. From a scholarly perspective, this constitutes a zoomorphic metaphor, whose primary function is to externalize the protagonist's psychological state through the surrounding environment. Furthermore, the interior of the well is described through details such as "layer upon layer," "damp crust," and "the search for water," all of which present it as a living organism. This represents an example of biomorphism, whereby the earth is conceptualized as a body, possessing skin and an internal structure. As a result, nature is portrayed not as a passive background but as an active living entity endowed with its own vitality. Existential Space and the Philosophy of Solitude In The Well, nature functions as an existential category. Yensep's life within the depths of the well - characterized by isolation, darkness, and endless labor - reveals the essence of human existence in conditions of profound solitude. The well itself symbolizes the unconscious, the dead end of fate, and the burden of human life. Consequently, the relationship between humanity and nature is presented not as an open struggle but as a process of silent

confrontation and adaptation. This philosophical dimension brings the novella into close dialogue with existentialist thought. Nature in The Küy: Ecological Culture and the Semiotics of Space Nature in The Küy is depicted from an entirely different perspective. Here, the steppe is represented as an immense, tranquil space that preserves the historical memory of the nation. Descriptions such as "the endless plain" and "the dark wormwood" portray nature as a harmonious system, a witness to the passage of time, and a carrier of cultural memory. This artistic vision embodies the concept of ecological culture. Space itself functions as a semiotic system in which wormwood symbolizes the continuity, endurance, and permanence of life. Thus, The Well (Shyngyrau) and The Küy (Küy) stand among the most profound philosophical works in Kazakh prose, each revealing a distinct dimension of the concept of nature. In both novellas, nature transcends the role of a traditional landscape and is transformed into a complex semiotic and existential system through which the author articulates his philosophical vision of humanity, history, and the natural world.

In The Well (Shyngyrau), nature is portrayed as a closed, oppressive force that draws human beings inward, whereas in The Küy (Küy), it appears as an open, boundless system that preserves historical memory. The Well is one of the most profound works in Kazakh literature exploring the principles of ecological ethics. The central conflict unfolds not between individuals but between humanity and the elemental forces of the earth. The protagonist, Yensep, is a professional well-digger. His tragedy lies not in his attempt to master nature but in transforming it into a means of personal profit and social

recognition. Yensep exemplifies anthropocentrism. Trusting entirely in his physical strength and professional skill, he dares to compete with the mysterious forces of nature, particularly underground water. Rather than perceiving water as the source of life, he regards it merely as an instrument for achieving fame and prestige. From an ecological perspective, the moment when the waters at the bottom of the well consume Yensep metaphorically represents nature's retribution against one who has violated and humiliated it. Here, Kekilbayev advances an ecocentric worldview, asserting that human beings are

not the masters of nature but an inseparable part of it. Yensep's fall into the depths of the well symbolizes the collapse of his excessive pride and arrogance. Thus, The Well serves as a philosophical warning that humanity's aspiration to elevate itself above nature inevitably leads to tragedy. For Abish Kekilbayev, ecological consciousness is not limited to protecting the natural environment; rather, it begins with the individual's ability to restrain personal ambition, greed, and the desire for domination over nature.

References.

- Kekilbayev, A. (1982). *Shyngyrau (The Well): Novellas and Short Stories*. Almaty: Zhazushy Publishing House.
- Kekilbayev, A. (1989). *Selected Works*. Almaty: Zhazushy Publishing House.
- Kabdolov, Z. (1976). *The Art of Words*. Almaty, p. 157.
- Ashimbayev, S. (1985). *The Purpose of Criticism*. Almaty: Zhazushy Publishing House.
- Eleukenov, Sh. (1992). *The Modern Era and Kazakh Literature*. Almaty: Gylm Publishing House.
- Maytanov, B. (1991). *Psychological Analysis in Kazakh Prose*. Almaty: Rauan Publishing House.

RESEARCH ARTICLE

Comparative Relations in English and Uzbek: Form, Meaning and Function

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Abstract

Comparative relations constitute one of the fundamental semantic categories through which speakers identify similarities, differences, superiority, equality, and degree between entities, actions, and qualities. Although English and Uzbek belong to different language families and demonstrate distinct grammatical systems, both languages employ a wide range of lexical, morphological, and syntactic devices to express comparative meaning. This study examines comparative relations in English and Uzbek from functional, semantic, and structural perspectives. Employing a contrastive linguistic approach, the research analyzes authentic examples selected from literary texts, academic sources, and contemporary language usage. The analysis demonstrates that English primarily relies on morphological markers (-er, -est) and analytical constructions involving more, most, and than, whereas Uzbek expresses comparison mainly through lexical particles, postpositions, and syntactic structures. Despite these structural differences, both languages perform comparable communicative functions, enabling speakers to evaluate, classify, and describe objects and phenomena. The findings contribute to comparative linguistics by identifying similarities and language-specific features in the realization of comparative meaning and provide practical implications for translation studies, English language teaching, and intercultural communication.

Keywords: comparative relations, comparison, English language, Uzbek language, contrastive linguistics, syntax, semantics, functional linguistics.

Introduction. Language serves as the principal medium through which human beings perceive, interpret, and communicate reality. Among the numerous semantic categories found in natural languages, comparison occupies a significant position because it enables speakers to evaluate objects, persons, situations, and events by identifying similarities and differences. Comparative relations are therefore not merely grammatical phenomena but also cognitive mechanisms through which people

organize knowledge and express judgments.

Every language possesses its own means of expressing comparison. These means are influenced by historical development, grammatical structure, and communicative traditions. English and Uzbek, representing the Indo-European and Turkic language families respectively, demonstrate both common functional characteristics and remarkable structural differences in the expression of comparative meaning.

In English, comparison is realized through morphological changes of adjectives and adverbs (*small – smaller – smallest*), analytical constructions (*more beautiful, the most interesting*), and syntactic patterns such as *as...as*, *more...than*, and *the...the....* Uzbek, however, primarily expresses comparison through lexical markers, postpositions, comparative particles, and contextual interpretation. Consequently, although the communicative purpose remains identical, the linguistic realization differs considerably.

The increasing importance of intercultural communication, translation, and foreign language education has intensified scholarly interest in comparative constructions. Understanding how comparative relations function across languages contributes not only to theoretical linguistics but also to practical language teaching and translation accuracy.

The objective of this article is to investigate comparative relations in English and Uzbek by analyzing their structural organization, semantic characteristics, and communicative functions using a contrastive linguistic approach.

The study seeks to answer the following research questions:

- How are comparative relations structurally expressed in English and Uzbek?
- What semantic similarities and differences exist between the two languages?
- What communicative functions do comparative constructions perform?
- Which language-specific features present challenges for learners and translators?

Literature Review. Comparison has long attracted the attention of linguists because it represents one of the universal semantic categories found across languages. Traditional grammar primarily viewed comparison as a morphological category associated with adjectives and adverbs. Contemporary linguistic studies, however, recognize comparison as a broader functional-semantic phenomenon involving lexical, syntactic, pragmatic, and cognitive dimensions.

Early descriptions of English comparison emphasized adjective inflection and analytical forms. Modern English grammar explains that comparative meaning is realized through several grammatical mechanisms, including morphological comparison (*tall – taller – tallest*), analytical comparison (*more efficient, most valuable*), equality constructions (*as...as*), inequality constructions (*less...than*), and proportional comparison (*the more..., the more...*). These constructions enable speakers to express evaluation, measurement, and logical relationships between entities.

Uzbek linguists describe comparison as a semantic category realized predominantly through syntactic and lexical means rather than inflectional morphology. Comparative meaning is frequently expressed by the postposition *-dan*, comparative words such as *ko'ra*, *qaraganda*, and lexical units including *eng*, *ancha*, *nihoyatda*, and *bir xil*. These elements interact with sentence structure to communicate superiority, equality, inferiority, approximation, and similarity.

Recent developments in functional linguistics suggest that comparative constructions should be analyzed not only in terms of grammatical form but also according to their communicative function.

Comparative expressions frequently appear in academic discourse, literary language, media texts, advertising, and everyday communication because they facilitate evaluation, persuasion, and description.

From the perspective of contrastive linguistics, English and Uzbek provide an interesting case for comparative analysis due to their typological differences. English belongs to the Germanic branch of the Indo-European language family and exhibits relatively rigid word order together with extensive analytical grammatical structures. Uzbek, as a Turkic language, demonstrates agglutinative morphology and comparatively flexible syntactic organization. These typological distinctions inevitably influence the realization of comparative relations.

Although numerous studies have examined comparison within each language separately, relatively few investigations have explored comparative relations through an integrated syntactic-semantic perspective involving English and Uzbek simultaneously. This gap provides the foundation for the present study, which aims to contribute to comparative linguistics by offering a systematic analysis of form, meaning, and function across the two languages.

Methodology. This study employs a **qualitative contrastive linguistic approach** to investigate comparative relations in English and Uzbek. The research focuses on identifying the structural, semantic, and functional characteristics of comparative constructions in both languages.

The data consist of examples collected from English grammar references, literary texts, authentic language materials, and standard Uzbek grammar sources. A total of representative

comparative constructions were selected to illustrate different types of comparison, including superiority, equality, inferiority, and proportional comparison.

The analysis was conducted in three stages. First, comparative structures in each language were identified according to their grammatical form. Second, the semantic meanings expressed by these structures were examined. Finally, the communicative functions of comparative constructions were compared to determine similarities and differences between the two languages.

Results and Discussion. The analysis demonstrates that both English and Uzbek possess rich linguistic resources for expressing comparison. However, they differ considerably in the grammatical mechanisms used to realize comparative meaning.

English relies primarily on **morphological** and **analytical** forms. Short adjectives generally form comparison by adding the suffix **-er**, whereas longer adjectives employ **more** and **most**.

In contrast, Uzbek expresses comparison mainly through **syntactic** and **lexical** devices.

Unlike English, Uzbek rarely depends on inflectional morphology alone. Comparative meaning is usually supported by postpositions such as **-dan**, **ko'ra**, **qaraganda**, and lexical intensifiers like **eng**, **ancha**, and **nihoyatda**.

Functional Analysis. Comparative constructions fulfill several communicative functions in both languages.

1. Evaluation

Comparison enables speakers to assess qualities.

Example:

- *English grammar is more complex than many learners expect.*

• **Ingliz tili grammatikasi ko'pchilik o'ylagandan murakkabroq.**

2. Description

Comparison enhances descriptive accuracy.

Example:

• *The river is wider than before.*

• **Daryo avvalgidan kengroq.**

3. Persuasion

Advertising and public discourse frequently employ comparison.

Example:

• *Our product is better than the competitors'.*

• **Mahsulotimiz boshqalarnikidan yaxshiroq.**

4. Scientific Communication

Academic writing often uses comparison to present research findings.

Example:

• *The experimental group achieved higher scores than the control group.*

• **Tajriba guruhi nazorat guruhiga nisbatan yuqoriroq natijalarni ko'rsatdi.**

Thus, despite grammatical differences, both languages employ comparative constructions for similar communicative purposes.

Comparative Analysis

Feature	English	Uzbek
Comparative marker	-er, more	-roq, -dan, ko'ra
Superlative	-est, most	eng
Equality	as...as	-dek, kabi, singari
Inferiority	less...than	kamroq, unchalik emas
Main grammatical type	Morphological + analytical	Lexical + syntactic
Word order	Fixed	Relatively flexible

The comparison demonstrates that English depends more heavily on grammatical morphology, whereas Uzbek expresses comparative meaning through syntactic organization and lexical elements.

Conclusion. Comparative relations represent an essential semantic category shared by both English and Uzbek. Although the two languages belong to different linguistic families and exhibit different grammatical systems, they perform comparable communicative functions in expressing evaluation, similarity, difference, and degree.

The study shows that English primarily realizes comparative meaning through morphological markers and

analytical constructions, whereas Uzbek relies mainly on lexical units and syntactic patterns. Despite these formal differences, both languages effectively convey comparable semantic relationships.

The findings highlight the importance of adopting a functional-semantic perspective when investigating comparative constructions. Such an approach contributes not only to theoretical linguistics but also to contrastive grammar, translation studies, and English language teaching. Understanding similarities and differences between English and Uzbek comparative systems may help language learners avoid grammatical interference and improve translation accuracy.

Future research may extend this study by examining comparative relations

in spoken discourse, corpus-based analyses, and cognitive linguistic perspectives.

References

- Biber, D., Conrad, S., & Leech, G. (2002). Longman Student Grammar of Spoken and Written English. Pearson Education.
- Crystal, D. (2008). A Dictionary of Linguistics and Phonetics (6th ed.). Blackwell Publishing.
- Greenbaum, S., & Quirk, R. (1990). A Student's Grammar of the English Language. Longman.
- Huddleston, R., & Pullum, G. K. (2002). The Cambridge Grammar of the English Language. Cambridge University Press.
- Quirk, R., Greenbaum, S., Leech, G., & Svartvik, J. (1985). A Comprehensive Grammar of the English Language. Longman.
- Dixon, R. M. W. (2012). Basic Linguistic Theory. Volume 3: Further Grammatical Topics. Oxford University Press.
- Croft, W. (2003). Typology and Universals (2nd ed.). Cambridge University Press.
- Haspelmath, M. (2001). The European Linguistic Area: Standard Average European. In M. Haspelmath et al. (Eds.), Language Typology and Language Universals (pp. 1492–1510). Walter de Gruyter.
- Abdurahmonov, G'. (1996). Hozirgi o'zbek adabiy tili sintaksisi. Toshkent: O'qituvchi.
- Mahmudov, N. (2013). O'zbek tilining nazariy grammatikasi. Toshkent.
- Sayfullayeva, R., Mengliyev, B., Boqiyeva, G., Qurbonova, M., & Yunusova, Z. (2010). Hozirgi o'zbek adabiy tili. Toshkent: Fan va texnologiya.

RESEARCH ARTICLE

Seasonal Migration Of Birds In The Mountain Ranges Of State Reserve Surkhon: Ecological Features And Habitat Adaptation

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Abstract

This scientific report summarizes the results of ornithological studies conducted in 2025–2026 in the Kohitang mountain range, including the Surkhon State Reserve. During the study, 137 bird species belonging to 13 orders and 34 families were recorded in the reserve, 11 of which are included in the Red Data Book of the Republic of Uzbekistan. Based on spring and autumn seasonal counts, the abundance, biotope distribution, and population dynamics of rare and predatory bird species, including *Gypaetus barbatus*, *Aquila chrysaetos*, *Aegypius monachus*, *Gyps fulvus*, *Ciconia nigra*, and others, were analyzed. The results provide a scientific and practical basis for improving the conservation and monitoring of the avifauna of the Kohitang Mountains.

Keywords: avifauna; seasonal migration; Kohitang Mountains; Surkhon State Reserve; ornithological monitoring; rare birds; population dynamics.

1. Introduction

Biodiversity is one of the factors underlying sustainable development and represents an important and potentially valuable resource for meeting the economic, ecological, and cultural-aesthetic needs of humanity. It ensures the formation and functioning of the biosphere as an integrated system in which humans live and develop alongside other biological species. In recent decades, anthropogenic pressure on the natural environment has intensified. Global and local environmental problems, including climate change, accelerated desertification, reduction of forest areas, extinction of certain animal species, and degradation of land resources, pose serious risks to human civilization. Therefore, the study and conservation of

biodiversity have become among the most urgent global priorities.

The Republic of Uzbekistan is characterized by considerable diversity of flora and fauna distributed across different natural complexes. Conservation of the environment, plant and animal life, and natural components remains one of the most important tasks of the present period. Surkhondaryo Region is one of the regions of Uzbekistan with distinctive natural complexes and is particularly notable for the antiquity and diversity of its fauna. Some animal species occurring in the region developed under local conditions, whereas others entered the area through migration from neighboring territories. Distinct faunal complexes have formed across the diverse landscapes of

Surkhandarya, from deserts and oases to mountains and tugai forests. Consequently, studying rare animal and plant species in Uzbekistan, increasing their populations, and implementing restoration measures are important directions for biodiversity conservation.

Birds are an integral component of natural ecosystems and play important ecological roles in nutrient and energy cycling, seed dispersal, and regulation of harmful insect populations. They are also considered bioindicators of environmental conditions. The avifauna of the Kohitang Mountains has not yet been sufficiently studied, and information on species composition, bioecological characteristics, and factors responsible for declines in species listed in the Red Data Book of Uzbekistan remains incomplete. The avifauna of the Kohitang Mountains was initially studied in part by N. A. Zarudny, L. S. Stepanyan, Kh. S. Solikhboyev, O. Bogdanov, M. M. Ostapenko, and other researchers. In particular, O. Bogdanov provided brief ecological descriptions of several species occurring in the area, including *Gypaetus barbatus*, *Aquila chrysaetos*, *Ciconia nigra*, *Aegypius monachus*, and *Gyps fulvus*, in his work "Animals of Uzbekistan". However, the lack of modern, systematic, and long-term monitoring data on the regional avifauna determines the relevance of the present study.

The aim of the study was to determine the species composition of representatives of the class Aves occurring in the Kohitang Mountains, including the Surkhon State Reserve; to study the bioecological characteristics of species included in the Red Data Book of Uzbekistan; and to characterize them from an ecological-monitoring perspective.

The study objectives were to: (1) determine the bird species composition at order, family, and species levels in the Kohitang Mountains and Surkhon State Reserve; (2) conduct spring and autumn seasonal fauna counts along nine designated counting routes and statistically analyze the obtained data; (3) study the distribution, abundance, nesting biotopes, and feeding characteristics of rare bird species included in the Red Data Book of Uzbekistan; (4) assess seasonal population dynamics of rare species; and (5) develop scientific and practical recommendations for the conservation of birds and their habitats.

2. Materials and Methods

2.1. Study methods

During the field studies, anonymous survey data were collected and analyzed from reserve staff and residents of the villages of Xatak, Xo'janqo, Kampirtepa, Shalqon, Sherjon, Qizilolma, and Vandob surrounding the reserve. The results of fauna counts conducted in the Surkhon State Reserve were also analyzed. Counts were conducted using classical ornithological methods: the linear-route (transect) method and observations from fixed (stationary) points. The work was carried out along nine permanent counting routes established in advance within the reserve. Multi-year fauna-count data were processed statistically, including calculation of cumulative species-level indicators and inter-seasonal dynamics.

Long-distance observations and photography were conducted using an AG-60 spotting scope, Nikon binoculars, and camera traps. Scientific literature relevant to the study topic was reviewed and analyzed.

2.2. Study area, routes, and equipment

The fieldwork was planned and initiated at the administrative building of the Surkhon State Reserve. Nine counting routes were established within the reserve, with a combined length of approximately 172.8 km. The counting team departed at 08:00 and then stayed in the mountainous field conditions for 3–4 days while conducting field research along the designated routes.

A Niva 4×4 vehicle was used to reach the designated areas. The field team was equipped with a camera, camera traps, binoculars, a tent, sleeping bags, a GPS device, a night-vision device, and a spotting scope.

3. Results

3.1. Species composition of the avifauna

The avifauna of the Surkhon State Reserve differs from the bird fauna of other parts of the region in its distinctive

diversity. Seasonal migrants, resident species, wintering birds, and breeding species occur in the area, including rare species listed in the Red Data Books of Uzbekistan and at the international level. The scientific data collected to date represent an initial stage of research in this direction and provide a foundation for further scientific investigations.

The study established that the bird fauna recorded in the reserve comprises 13 orders, 34 families, and 137 species (Table 1). Passeriformes had the largest number of species, comprising 19 families and 92 species, or 67.2% of the total species composition. Falconiformes ranked second, with 2 families and 17 species (12.4%). The remaining 11 orders were represented by fewer species, although they included numerous large predatory birds and rare species that play important ecological roles in the reserve ecosystem.

Table 1. Distribution of recorded birds in the Surkhon State Reserve by order

Order	Number of families	Number of species	Share
Passeriformes	19	92	67.2%
Falconiformes	2	17	12.4%
Columbiformes	1	7	5.1%
Galliformes	1	4	2.9%
Coraciiformes	3	4	2.9%
Strigiformes	1	4	2.9%
Ciconiiformes	1	2	1.5%
Apodiformes	1	2	1.5%
Gruiformes	1	1	0.7%
Cuculiformes	1	1	0.7%
Caprimulgiformes	1	1	0.7%
Upupiformes	1	1	0.7%
Coliiformes	1	1	0.7%
Total	34	137	100%

Work aimed at determining the species composition and distribution sites (biotopes) of seasonal and breeding birds in

the reserve is continuing systematically. Beginning with the spring 2025 count, the species known in the source report as “Tog’

zag'chasi'' was separately added to the counting list for targeted study of its habitat and population.

3.2. Results of seasonal fauna counts

Three seasonal counts were conducted in 2025–2026 to determine the abundance of common and rare bird species

occurring in the Surkhon State Reserve: 28–30 May 2025 (spring), 18–20 November 2025 (autumn), and 13–15 May 2026 (spring). Each count was conducted simultaneously along all nine routes of the reserve.

Count Record for the Spring Fauna
Survey Conducted on 28–30 May 2025

№	Species	No. 1 Xo'jak sar 26.8 km	No. 2 Xat ak 26.3 km	No. 3 Xo'ja nqo 15 km	No. 4 Qizilol ma 27.3 km	No. 5 Shalq on 15.6 km	No. 6 Kampirt epa 23.4 km	No. 7 Sherj on 16.2 km	No. 8 Vand ob 11.2 km	No. 9 Daroyi g'ul 11 km	Tot al
1	(<i>Accipiter nissus</i>)	5	11	7	5	9	4	8	9	3	61
2	(<i>Alectoris chukar</i>)	193	338	221	98	145	275	201	523	65	2049
3	(<i>Gypaetus barbatus</i>)	4	7	3	4	8	7	9	8	2	52
4	(<i>Ammope rdix griseogul aris</i>)	29	15	14	22	11	7	43	41	2	184
5	(<i>Neophro n percnopte rus</i>)	3	6	2	-	5	2	9	5	5	37
6	(<i>Aegypius monachus</i>)	4	4	5	3	6	3	9	5	5	44
7	(<i>Gyps fulvus</i>)	18	12	18	7	19	11	20	25	8	138
8	(<i>Aquila chrysaeto s</i>)	5	7	5	4	9	5	8	12	6	61
9	(<i>Ciconia nigra</i>)	4	1	-	-	-	-	-	-	-	5
10	(<i>Falco naumanni</i>)	5	1	4	3	4	3	1	7	1	29
11	(<i>Falco pelegrinoi des</i>)	2	4	2	-	2	2	4	3	1	20
12	(<i>Falco cherrug</i>)	2	6	2	2	2	-	5	5	-	24

1 3	(<i>Streptopelia turtur</i>)	16	13	16	13	9	14	9	11	5	106
1 4	(<i>Pyrrhoxorax pyrrhoxorax</i>)	15	13	12	15	21	9	9	14	22	130

Count Record for the Autumn
Fauna Survey Conducted on 18–20
November 2025

No.	Species	No. 1 Xo'jak sar 26.8 km	No. 2 Xat ak 26.3 km	No. 3 Xo'jan qo 15 km	No. 4 Qizilol ma 27.3 km	No. 5 Shalq on 15.6 km	No. 6 Kampirt epa 23.4 km	No. 7 Sherj on 16.2 km	No. 8 Vand ob 11.2 km	No. 9 Daroyi g'ul 11 km	Total
1	(<i>Accipiter nisus</i>)	6	11	7	4	10	5	7	10	4	64
2	(<i>Alectoris chukar</i>)	213	304	211	127	147	280	235	530	114	2161
3	(<i>Gypaetus barbatus</i>)	5	6	4	5	9	7	8	9	4	57
4	Chil	32	31	15	29	13	27	39	33	16	235
5	(<i>Neophron percnopterus</i>)	3	9	1	1	6	4	8	6	6	44
6	(<i>Aegypius monachus</i>)	5	2	4	4	7	4	9	6	5	46
7	(<i>Gyps fulvus</i>)	20	11	20	8	18	6	21	26	9	139
8	(<i>Aquila chrysaetos</i>)	6	9	4	6	6	6	9	13	8	67
9	(<i>Ciconia nigra</i>)	3	3	-	-	-	-	-	-	-	6

Count Record for the Spring Fauna
Survey Conducted on 13–15 May 2026

No.	Species	No. 1 Xo'jak sar	No. 2 Xat ak	No. 3 Xo'jan qo 15 km	No. 4 Qizilol ma	No. 5 Shalq on	No. 6 Kampirt epa 23.4 km	No. 7 Sherj on	No. 8 Vand ob	No. 9 Daroyi g'ul 11 km	Total
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		26.8 km	26.3 km		27.3 km	15.6 km		16.2 km	11.2 km		
1	(<i>Accipiter nissus</i>)	10	10	7	6	5	5	9	8	5	65
2	(<i>Alectoris chukar</i>)	202	342	222	185	152	312	206	494	70	218 5
3	(<i>Gypaetus barbatus</i>)	5	6	4	6	8	7	10	9	3	58
4	(<i>Ammope rdix griseogul aris</i>)	30	37	15	25	-	10	45	44	27	229
5	(<i>Neophro n percnopte rus</i>)	4	4	2	6	4	3	10	5	6	44
6	(<i>Aegyptius monachus)</i>	5	6	5	7	2	4	9	5	4	47
7	(<i>Gyps fulvus</i>)	19	13	19	8	12	12	20	26	11	140
8	(<i>Aquila chrysaeto s</i>)	8	7	5	10	6	6	8	12	6	68
9	(<i>Ciconia nigra</i>)	6	-	-	-	-	-	-	-	-	6
1 0	(<i>Falco naumanni)</i>	6	3	5	3	2	4	2	6	2	33
1 1	(<i>Falco pelegrinoi des</i>)	5	3	3	-	-	3	3	2	3	22
1 2	(<i>Falco cherrug</i>)	3	4	-	2	-	2	4	2	6	23
1 3	(<i>Streptope lia turtur</i>)	17	12	14	15	-	16	8	12	15	109
1 4	(<i>Pyrrhoco rax pyrrhoco rax</i>)	16	15	14	14	33	11	10	20	24	157

3.3 Comparative analysis of count dynamics

Comparison of the three seasonal counts indicates an increasing trend in the total numbers of all major observed species

from spring 2025 to spring 2026 (Table 2). In particular, the number of *Alectoris chukar* increased from 2,049 to 2,185 individuals; *Gypaetus barbatus* from 52 to 58; *Aquila chrysaetos* from 61 to 68; and

Aegypius monachus from 44 to 47. The most pronounced increases were recorded for *Neophron percnopterus* and *Ciconia nigra*, which may be associated with adaptation to local conditions or improvements in search and observation

methods. The number of *Gyps fulvus* remained relatively stable (138–140 individuals), which may indicate stabilization of this species' population within the reserve.

Table 2. Population dynamics of large predatory and rare bird species in 2025–2026

Species	Spring 2025	Autumn 2025	Spring 2026	Change (2025 spring → 2026 spring)
(<i>Accipiter nisus</i>)	61	64	65	+6.6%
(<i>Alectoris chukar</i>)	2049	2161	2185	+6.6%
(<i>Gypaetus barbatus</i>)	52	57	58	+11.5%
(<i>Ammoperdix griseogularis</i>)	184	235	229	+24.5%
(<i>Neophron percnopterus</i>)	37	44	44	+18.9%
(<i>Aegypius monachus</i>)	44	46	47	+6.8%
(<i>Gyps fulvus</i>)	138	139	140	+1.4%
(<i>Aquila chrysaetos</i>)	61	67	68	+11.5%
(<i>Ciconia nigra</i>)	5	6	6	+20.0%

3.4. Seasonal distribution and habitat observations

It should be emphasized that increases in count indices do not necessarily represent actual population growth. They may partly reflect improvements in observation methodology, accumulated experience along the routes, and changes in weather conditions. Therefore, the observed trends should not be regarded as final conclusions, but rather as preliminary results that require confirmation through monitoring in subsequent years.

During the studies conducted throughout the reserve, greater concentrations of birds during winter were observed in Quruqqo'l Gorge, the western part of Qoplon Gorge, Qo'ldaroz Gorge, Bog'lidara, Shomuroddara, Zaravutsoy, and

the southern and eastern parts of the Vandob section. In January–February 2026, precipitation was greater and air temperatures were lower than during the same period in 2025. On some days, daytime temperatures fell to -10 to -13 °C and nighttime temperatures reached -20 °C; snow cover persisted for 5–10 days. Such sharp temperature changes created considerable difficulties for some bird species in finding food.

Differences were also observed in the timing of arrival of seasonal migratory birds in the reserve. In the first quarter of 2025, this process was mainly observed at the beginning of March, whereas in the corresponding period of 2026, arrival began toward the end of March. For example, swallows were first recorded in the city of Termez, Surkhandarya Region, on 25 March, while they began to be encountered

in the reserve on 13–14 March. The passage of cranes was first recorded on 27 March and continued until 10 April. In the middle part of the mountains, species such as the grey thrush, black thrush, spotted rock thrush, pied thrush, carrion crow, hooded crow, and raven were more frequently encountered, whereas at higher elevations the scavenging birds *Gyps fulvus*, *Gypaetus barbatus*, and *Aegypius monachus* were observed in flight.

Among the large predatory birds, *Gyps fulvus*, *Gypaetus barbatus*, and *Aegypius monachus* were regularly encountered throughout the reserve, particularly in the Xatak and Xo'janqo sections. White storks listed in the Red Data Books of Uzbekistan and at the international level were not recorded in the reserve during this season; this requires particular attention during subsequent monitoring periods.

3.5. Resident birds and their bioecology

Observations conducted during 2025–2026 established that resident birds occurring in the reserve currently comprise 5 orders, 16 families, and 44 species. Some of these species are unevenly distributed across the Kohitang range and the Surkhon State Reserve and differ in population density, habitat dependence, and other bioecological characteristics. Resident species include *Accipiter nisus*, *Alectoris chukar*, *Falco cherrug*, *Streptopelia turtur*, *Neophron percnopterus*, and *Falco peregrinoides*, each of which is described below.

A total of 11 bird species included in the Red Data Book of the Republic of Uzbekistan were recorded in the reserve. During the first half of 2026, these rare species were directly recorded in the Kohitang Mountains, particularly in seven

sections of the Surkhon State Reserve. The following are brief eco-monitoring descriptions of selected Red Data Book species studied during the first half of 2026.

***Ciconia nigra* (Linnaeus, 1758)**

Uzbekistan Red Data Book category: 2 (VU:R) — Vulnerable, naturally rare, with a declining population; a breeding and passage species.

International conservation status (MSOP/IUCN): LC (Least Concern), but considered vulnerable in Central Asia and at the regional level.

CITES: Appendix II.

Resident in the Kohitang Mountains. For nesting, it selects steep rocky sites in the Oroltog', Tangidevoldara, Shalqon, Sariqamishsoy, and Boyqo'nish massifs. During the spring 2026 count, a total of 6 Black Storks were recorded on the Xo'jaksar route.

Unlike the White Stork, it nests away from human settlements, near shady forests, mountain rivers, quiet lakes, and wetlands. It feeds mainly on fish, amphibians (frogs), aquatic invertebrates, and occasionally small rodents and reptiles. It builds large nests in trees and on steep cliffs and lays 2–5 eggs. Habitat loss, human disturbance, and drying of water bodies are limiting factors.

***Gypaetus barbatus* (Linnaeus, 1758)**

Uzbekistan Red Data Book category: 2 (VU:R) — Vulnerable, naturally rare.

International conservation status (MSOP/IUCN): NT (Near Threatened). The national classification of Uzbekistan records category 4.

CITES: Appendix II.

It inhabits steep cliffs, deep gorges, and alpine mountain meadows at elevations of more than 2,000–4,000 m above sea

level. It is a large and widely distributed predatory bird in the Kohitang Mountains. Nests have mainly been recorded in the Oltikunlik, Tangidevol, Quruqqo'l, Qo'ldaroz, Daroyig'ul, Sovuqbuloq, Daracha, Toshliyrutsoy, and Boyqo'nish gorges. It selects steep, partly shaded cliff sites inaccessible to people and other animals. It feeds mainly on small birds and carrion and occasionally on young urials. It is more common in Quruqqo'l Gorge. During the spring 2026 count, 10 individuals were recorded on the Sherjon route, 8 on the Shalqon route, and 9 on the Vandob route, for a total of 58.

An unusual characteristic among predatory birds is that bones constitute 70–90% of its diet. It drops large bones from a height onto rocks to break them and consumes the marrow and fragments. It nests in caves and ledges of steep cliffs and lays 1–2 eggs.

***Aquila chrysaetos* (Linnaeus, 1758)**

Uzbekistan Red Data Book category: 2 (VU:R) — Vulnerable, naturally rare.

International conservation status (MSOP/IUCN): LC (Least Concern), with a declining trend. The national protection category of Uzbekistan is recorded as level 3.

One of the largest predatory birds in the Kohitang Mountains. Nests occur in Oltikunlikdara, Tangidevoldara, Daroyig'ul, Kattatog, and Zaravutsoy. Like the Bearded Vulture, it builds nests in difficult-to-access locations. It mainly feeds on *Alectoris chukar*, “Chil”, some predatory mammals, and young urials. Golden Eagles were encountered in almost all parts of the reserve during 2026, and 68 individuals were recorded during the spring count.

Wingspan is 1.8–2.3 m and body mass is 3–6.3 kg, with females larger than males. It inhabits open mountain slopes, high-altitude alpine meadows, gorges, and sparsely visited areas of deserts and residual mountains. It feeds mainly on hares, marmots, *Alectoris chukar*, reptiles, and young small ungulates. It builds large nests on steep cliffs and tall trees. It lays 1–3 eggs in February–March and incubates them for 40–45 days.

***Aegypius monachus* (Linnaeus, 1766)**

Uzbekistan Red Data Book category: 3 (NT) — Near Threatened, naturally rare and vulnerable.

International conservation status (MSOP/IUCN): NT (Near Threatened). It is included in category 4 of the national protection list of Uzbekistan.

CITES: Appendix II.

It is the largest bird in the Kohitang Mountains. It nests on steep cliffs in areas bordering Turkmenistan; confirmed nests were recorded in the Vandob, Xatak, and Kampirtepa sections. According to the spring count conducted on 13–15 May 2026, 9 individuals were recorded on the Sherjon route and 7 on the Qizilolma route, for a total of 47.

It is the largest representative among the species described here, with a body mass of up to 14 kg and a wingspan of up to 3.1 m. It inhabits mountain slopes at 1,000–3,000 m, open alpine meadows, and areas with juniper forests and is primarily a scavenger. It feeds on carrion and carcasses of large wild and domestic animals and helps prevent the spread of various diseases. It builds a large nest on the tops of large trees, mainly junipers, or on ledges of steep cliffs. It lays one egg, rarely two, in February–March, incubated alternately by both sexes.

Gyps fulvus (Hablizl, 1783)

Uzbekistan Red Data Book category: 3 (NT) — Near Threatened, naturally rare and vulnerable.

International conservation status (MSOP/IUCN): LC (Least Concern). At the regional level, however, it is considered to require protection.

CITES: Appendix II.

A predatory bird that is poorly studied and relatively uncommon in the Kohitang Mountains. According to the spring count conducted on 13–15 May 2026, 26 individuals were recorded on the Vandob route, 20 on the Sherjon route, and 19 each on the Xo'janqo and Xo'jaksar routes, for a total of 140.

It inhabits steep cliffs, deep gorges, and mountainous areas adjoining pastures and alpine meadows at elevations of 1,000–3,500 m. It is relatively scarce and scattered in the mountains of Central Asia, which is why it is included in the Red Data Book of Uzbekistan. Wingspan is 2.3–2.8 m and body mass is 6–13 kg. It nests colonially and is a natural sanitary scavenger feeding exclusively on carrion. Nests are built in caves and on ledges of steep cliffs, often in colonies. It lays one, rarely two, eggs in February–March, incubated alternately by both parents.

Falco naumanni Fleischer, 1818

Uzbekistan Red Data Book category: 3 (NT) — Near Threatened, with declining abundance and range.

International conservation status (MSOP/IUCN): LC (Least Concern). In earlier assessments it was classified as VU (Vulnerable), but its status improved following global population recovery.

CITES: Appendix II.

Its distribution and population in the Kohitang Mountains are currently poorly studied. According to data from the 1960s

(Kh. S. Solikhboyev and M. M. Ostapenko), it was recorded in the foothills of the Kohitang range. During the spring 2025 count (28–30 May), it was recorded on 26 March; 7 individuals were observed on the Vandob route and 5 on the Xo'jaksar route. It was also encountered in Bog'lidara and Shomuroddara.

Unlike other falcons, it nests colonially. It is a small-bodied migratory falcon that uses cracks in cliffs, walls of mud fortresses and ruins, old buildings, and sometimes tree cavities for nesting. It lays 3–5 reddish-spotted eggs in May and incubates them for 28 days. It occurs in steppe regions from the Mediterranean to Mongolia and China and winters in Africa. Its numbers declined sharply at the end of the twentieth century because of agricultural intensification and loss of nesting sites, and it was previously classified as Vulnerable.

Falco pelegrinoides Temminck, 1829

Uzbekistan Red Data Book category: 2 (VU:R) — Vulnerable, with a restricted distribution. Its abundance and habitat range are naturally limited and require special protection.

IUCN Red List: LC (Least Concern). It is often treated as a subspecies of the Peregrine Falcon (*Falco peregrinus peregrinus* / *Falco peregrinus pelegrinoides* in the source wording), and therefore is not assessed separately as threatened.

CITES: Appendix I — species at very high risk of extinction for which international trade is strictly prohibited.

A vulnerable, naturally rare, semi-resident subspecies; within the reserve it is considered resident. According to the spring count of 13–15 May 2026, a total of 22 individuals were recorded, with the highest number on the Xo'jaksar route; it

was not recorded on the Qizilolma and Shalqon routes.

It inhabits deserts, semi-deserts, and rocky mountain areas and mainly captures other birds in flight. Its range extends from North Africa through Western and Central Asia to mountainous areas of the Arabian Peninsula. The main causes of decline are illegal capture for falconry and disturbance of nesting sites.

Alectoris chukar (J.E.Gray, 1830)

A medium-sized bird with gray plumage with a reddish-pink tone on the head, neck, anterior back, shoulder, and upper wing coverts. Body mass is approximately 350–650 g. It is resident in the reserve. According to the spring count of 13–15 May 2026, 2,185 individuals were recorded; the highest numbers were on the Vandob route (494) and Xatak route (342).

It is widely distributed in mountainous and foothill areas of Western, Central, and South Asia and has a stable population. In the reserve avifauna, it is one of the most numerous species and forms an important link in the food chain, being a major prey species for predatory birds.

Accipiter nisus (Linnaeus, 1758)

A small predatory bird distinguished by short, broad wings and a long tail, enabling agile flight among trees. Adult males have a body length of 29–34 cm, a wingspan of 59–64 cm, a total length of 35–41 cm, and a body mass of approximately 186–345 g. The upperparts are grayish-blue, while the chest and abdomen have yellowish-rufous streaks; the lower surface is marked with dark brown streaks. It is resident in the reserve. According to the spring count of 13–15 May 2026, 65 individuals were recorded; 10 each were recorded on the Xatak and Xo'jaksar routes and 9 on the Sherjon route.

It mainly feeds on small and medium-sized birds, including sparrows, starlings, larks, finches, and pigeons. Females are larger and can capture somewhat larger prey. It mainly builds compact nests from twigs in trees and lays 4–6 whitish eggs with dark spots in spring, incubating them for approximately 33–35 days.

Falco cherrug J.E.Gray, 1834

Uzbekistan Red Data Book category: 3 (NT) — Near Threatened; abundance and range are steadily declining.

IUCN Red List: EN (Endangered) — a threatened species. It is classified internationally in a higher-risk category because of a sharp global population decline.

CITES: Appendix II — international trade and transport are strictly controlled.

It belongs to the falcon family. Wingspan is 35–43 cm; female body mass is 820–980 g and male body mass is approximately 970–1,130 g. It occurs in mountainous and lowland areas of Uzbekistan, nests in trees and on rocks, and mainly feeds on birds and rodents. It is resident in the reserve. According to the spring count of 13–15 May 2026, 23 individuals were recorded; the highest number was on the Daroyig'ul route (6), followed by Xatak and Sherjon (4 each).

The upperparts are brown to dark brown with lighter feather edges. It feeds mainly on small and medium-sized rodents and birds. It stalks prey in low flight and pursues it rapidly near the ground. The head and neck are pale with dark streaks; the underparts are whitish with dark brown spots and streaks. It nests in cavities in cliffs, mud and stone ravines, sometimes on power pylons or in abandoned nests of larger birds such as crows and the species called “Jo'rchi” in the source. It lays 3–5

reddish-brown spotted eggs in March–April, incubated mainly by the female for 30–33 days. Because of its sharp decline, it has been elevated internationally to the Endangered (EN) category, making its conservation particularly important for range states such as Uzbekistan.

***Streptopelia turtur* (Linnaeus, 1758)**

Uzbekistan Red Data Book status: 2 (VU:D) — Vulnerable, with a declining population. It was included in the national Red Data Book because its population in Uzbekistan has decreased substantially in recent years owing to habitat change and reduced food resources.

IUCN (MSOP) Red List: VU (Vulnerable). According to the international assessment conducted in 2015, its global status declined and it was moved from LC (Least Concern) to VU (Vulnerable).

Slightly smaller than a pigeon, with a bluish-gray upper head and neck, a light brown back, and black legs. Body length is 270–315 mm and body mass is approximately 100–130 g. It is resident in the reserve. According to the spring count of 13–15 May 2026, 109 individuals were recorded; the highest numbers were on the Xo'jaksar route (17), Kampirtepa (16), and Daroyig'ul (15).

The back has a rusty-brown and black-spotted pattern, with a distinctive black-and-white striped collar on both sides of the neck. It is a passage and breeding bird. It arrives in Uzbekistan in spring (late April–May) and leaves in autumn (August–September) to winter in sub-Saharan and Central Africa. It inhabits foothills, riverine tugai forests, gardens, orchards, and shelterbelts. It feeds mainly on seeds of wild and cultivated plants and cereal crops.

***Neophron percnopterus* (Linnaeus, 1758)**

Uzbekistan Red Data Book status: 2 (VU:D) — Vulnerable, with a declining population trend. Its distribution in the country is restricted and its numbers are decreasing.

CITES: Appendix II — international trade is strictly controlled.

A predatory bird of the Accipitridae family, 60–70 cm in length and weighing up to 2.5 kg. During the breeding period it inhabits mountains, hills, and ravines and nests on cliffs and in ravines. It is resident in the reserve. According to the spring count of 13–15 May 2026, 44 individuals were recorded; the highest numbers were on the Sherjon route (10) and Qizilolma route (6).

Adults have whitish-yellowish plumage with distinctly black wing tips. The head and throat are featherless and covered with bare yellow or orange skin. The bill is relatively slender and hooked. It is a sanitary scavenger and feeds mainly on carrion, waste, and small bones, and sometimes on lizards, tortoises, and bird eggs.

4. Discussion

The results show that the Surkhon State Reserve supports a diverse avifauna comprising 137 species in 34 families and 13 orders. The dominance of Passeriformes, which account for 67.2% of the recorded species, is consistent with the broad ecological diversity of the reserve. At the same time, the occurrence of large predatory and scavenging birds is particularly important for ecosystem functioning.

The seasonal counts showed increases in the observed numbers of several principal species between spring 2025 and spring 2026. However, the study

itself emphasizes that these changes cannot automatically be interpreted as true population growth because observation efficiency, accumulated field experience, and weather conditions may affect count indices. Consequently, the trends should be treated as preliminary until supported by longer-term monitoring.

The spatial concentration of birds in particular gorges and sections during winter, together with differences in seasonal arrival timing, indicates that habitat conditions and weather can influence bird distribution and detectability. The cold conditions recorded in January–February 2026, including temperatures down to -20°C at night and persistent snow cover, likely increased food-searching difficulties for some species. The absence of White Stork records during the observed season also indicates the need for continued monitoring.

The study further indicates that several rare species remain insufficiently studied in the Kohitang Mountains, particularly *Falco naumanni* and *Falco pelegrinoides*. Their restricted or poorly documented distribution supports the need for targeted research. The recorded nesting sites of large raptors should likewise receive special protection, while local communities should be more actively involved in biodiversity awareness and conservation.

5. Conclusion and Scientific-Practical Recommendations

The results of studies conducted in the Kohitang Mountains and analysis of data collected in recent years in the Surkhon State Reserve indicate that nature conservation activities within the reserve and surrounding areas are generally

established at an adequate level, and consequently the conservation status of birds, including rare species, is relatively favorable. At the same time, the need for more detailed study of these species and stronger protection regimes in their distribution areas remains.

Analysis of data collected through studies of the ecology of rare bird species indicates that anthropogenic factors have a negative influence on population growth. Overall, the species composition of birds occurring in the Kohitang Mountains, particularly the ecology and biology of rare resident species, remains insufficiently studied. Therefore, research should be continued systematically.

- Maintain the nine established counting routes and continue seasonal (spring and autumn) monitoring regularly at least twice a year.

- Place identified nesting sites of large predatory birds such as *Gypaetus barbatus*, *Aquila chrysaetos*, *Aegypius monachus*, and *Gyps fulvus* under a special protection regime.

- Develop a dedicated scientific research program for poorly studied species such as *Falco naumanni* and *Falco pelegrinoides*.

- Expand environmental education and biodiversity-conservation awareness activities among residents of the surrounding villages (Xatak, Xo'janqo, Kampirtepa, Shalqon, Sherjon, Qizilolma, and Vandob).

- Maintain count data in a unified electronic database and regularly analyze annual population dynamics.

- Regularly publish research results in international and local scientific journals and expand scientific cooperation with higher-education institutions.

References

- Bogdanov, O. Animals of Uzbekistan. Tashkent: O'qituvchi, 1984.
- Salikhbaev, Kh. S., & Ostapenko, M. M. Vertebrate Animals of Southern Uzbekistan. Tashkent, 1964.
- Volzheninov, N. N., Taryannikov, V. I., & Abdunazarov, B. B. Rare and endangered mammals and birds of southern Uzbekistan. In Ecology and Protection of Rare and Endangered Vertebrates of Uzbekistan, 1985, pp. 3–29.
- Shernazarov, E. Sh., et al. Vertebrate Animals of Uzbekistan. Tashkent: Fan, 2006.
- Red Data Book of the Republic of Uzbekistan. Vol. 2. Tashkent, 2019.
- Book of Natural Complex Monitoring in the Surkhon State Reserve. 2010–2023.
- Scientific Reports of the Surkhon State Reserve. 2010–2023.
- Fauna Count Data of the Surkhon State Reserve. 2023.

RESEARCH ARTICLE

Cross-Linguistic Patterns of Euphemism Formation in Political Discourse: Evidence from a Multilingual Corpus

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Abstract

Euphemism is a pervasive linguistic phenomenon through which speakers replace direct, potentially offensive, sensitive, or socially undesirable expressions with alternative forms that reduce their negative pragmatic impact. Although euphemism has received considerable attention in linguistic, sociolinguistic, pragmatic, and discourse-analytic research, comparatively less attention has been paid to the ways in which euphemistic expressions are formally constructed across typologically diverse languages. This study investigates cross-linguistic patterns of euphemism formation in political discourse through a corpus-based comparative framework. The proposed multilingual corpus focuses on English, Uzbek, and Russian political discourse and examines euphemistic expressions at lexical, semantic, metaphorical, metonymic, morphological, and grammatical levels. The study adopts an integrated theoretical framework combining euphemism theory, pragmatics, political discourse analysis, and corpus linguistics. Euphemistic expressions are classified according to the linguistic mechanism through which a direct nomination is transformed into a socially or politically acceptable alternative. Particular attention is given to metaphor, metonymy, generalization, understatement, periphrasis, abstraction, lexical substitution, grammatical restructuring, and abbreviation. The analysis demonstrates that euphemization is simultaneously constrained by universal pragmatic motivations and shaped by language-specific structural resources and sociocultural conventions. Metaphorical and periphrastic formation emerge as particularly productive mechanisms in political discourse, while the distribution of morphological and grammatical strategies varies according to the structural characteristics of individual languages. The findings suggest that political euphemism should not be treated merely as lexical substitution but as a multidimensional process involving linguistic form, conceptual representation, pragmatic intention, and ideological positioning. The study contributes to cross-linguistic euphemism research by proposing a corpus-based classification framework that can support systematic comparison across languages.

Keywords: euphemism, political discourse, euphemization, corpus linguistics, cross-linguistic analysis, language typology, metaphor, metonymy, pragmatics, multilingual corpus

1. Introduction

Political discourse represents one of the most influential domains of public language. Political actors do not simply communicate information; they construct interpretations of events, categorize social

groups, justify policies, manage public perceptions, and negotiate relationships between political institutions and citizens. Consequently, the linguistic choices made in political communication frequently carry pragmatic and ideological implications that

extend beyond their literal meanings. One particularly significant linguistic phenomenon in this context is euphemism.

Euphemism may broadly be understood as the use of an alternative expression to refer to a concept that is considered unpleasant, sensitive, offensive, socially inappropriate, politically risky, or otherwise problematic. Rather than naming an event or phenomenon directly, speakers may select an expression that reduces its emotional impact, increases social acceptability, or creates conceptual distance between the audience and the represented reality. Euphemism is therefore not merely a stylistic ornament but a communicative resource associated with social norms, politeness, taboo, political correctness, persuasion, face management, and ideological discourse.

Allan and Burridge's influential work conceptualizes euphemism in relation to taboo, politeness, and the distinction between euphemistic, orthophemistic, and dysphemistic expressions. Their framework emphasizes that speakers continuously make choices between different ways of referring to the same or related realities depending on communicative circumstances. This perspective is particularly relevant to political discourse, where direct reference to death, military operations, economic difficulties, political repression, unemployment, migration, or social inequality may threaten a speaker's public image.

Political euphemism has consequently been examined as a strategy for mitigating controversial topics and protecting political actors from negative evaluations. Crespo-Fernández, for example, demonstrates that euphemism in political discourse can support positive

self-presentation, enable socially acceptable criticism of opponents, and conceal unsettling or controversial subjects. His analysis of political discourse identifies understatement, periphrasis, and metaphor as particularly important mechanisms.

Other studies have similarly demonstrated that political euphemism may function as a strategy of evasion. Research on English-language political media discourse, for example, has identified economic, politically correct, military, and diplomatic euphemisms and has analyzed their structural, semantic, and pragmatic characteristics. Research on military euphemism has additionally demonstrated that euphemistic expressions can create cognitive distance between recipients and unpleasant events, thereby reducing the immediate negative impact of the represented reality.

Despite this substantial body of research, an important issue remains insufficiently investigated: **how are political euphemisms actually formed across different linguistic systems?** Much existing research concentrates on a single language, a particular politician, a particular speech, or one political context. Such studies provide valuable descriptions of euphemistic usage but do not always distinguish between universal mechanisms of euphemization and language-specific strategies.

This distinction becomes especially important when typologically different languages are compared. English, Uzbek, and Russian differ considerably in their grammatical structures, lexical resources, morphological productivity, syntactic organization, and sociocultural histories. Consequently, speakers may employ similar pragmatic motivations while using

different formal mechanisms to achieve euphemistic effects.

The present study therefore focuses specifically on **cross-linguistic patterns of euphemism formation in political discourse**. Rather than asking only what euphemisms mean or what functions they perform, the study asks how direct political nominations are linguistically transformed into euphemistic alternatives.

The study hypothesizes that certain euphemization mechanisms, particularly metaphor, periphrasis, generalization, and understatement, are likely to demonstrate cross-linguistic recurrence because they are connected to broadly shared pragmatic motivations. At the same time, morphological and grammatical strategies are expected to display greater variation because they depend more directly on the structural resources of individual languages.

The significance of this research lies in its attempt to connect three dimensions of euphemism research: **form, meaning, and discourse function**. By combining corpus-based analysis with linguistic and pragmatic interpretation, the study proposes a framework through which euphemistic formation can be examined systematically across languages.

2. Literature Review and Theoretical Background

2.1. Euphemism as a linguistic phenomenon

The study of euphemism has a long tradition in linguistics. Allan and Burridge describe euphemism in relation to the avoidance or modification of taboo expressions and distinguish it from orthophemism, or direct and neutral expression, and dysphemism, which intensifies negative or offensive evaluation.

Importantly, euphemism is not restricted to a particular grammatical category. It may be realized through individual lexical items, multiword expressions, metaphorical constructions, abbreviations, technical terminology, grammatical structures, and extended descriptions. Allan and Burridge's earlier work identifies a wide range of euphemistic mechanisms, including circumlocution, metaphor, hyperbole, understatement, acronym formation, and technical terminology.

This multifunctionality makes euphemism particularly difficult to define exclusively in structural terms. A form is not necessarily euphemistic simply because it possesses a particular morphological or syntactic structure. Rather, its euphemistic status depends partly on its relationship with a more direct alternative and on the pragmatic context in which it occurs.

For example, an expression meaning "collateral damage" may appear semantically neutral in isolation. In a military context, however, it can function as a euphemistic alternative to a more explicit reference to civilian deaths. Similarly, expressions referring to "economic adjustment" or "negative growth" may acquire euphemistic meanings when used to avoid more direct references to economic decline.

Thus, euphemization involves a relationship between at least two conceptual representations:

direct representation → **euphemistic representation**

The euphemistic expression does not necessarily eliminate the original meaning. Instead, it modifies the way the referent is conceptualized or emotionally evaluated.

2.2. Euphemism and political discourse

Political discourse provides especially favorable conditions for euphemization because politicians frequently discuss topics involving conflict, social inequality, economic hardship, military intervention, death, migration, and political responsibility.

Political euphemisms may therefore serve several overlapping purposes. They can:

- mitigate unpleasant information;
- protect the speaker's public image;
- reduce potential audience resistance;
- maintain politeness;
- avoid direct attribution of responsibility;
- construct positive representations of political action;
- obscure undesirable consequences;
- frame controversial policies in acceptable terms.

Crespo-Fernández's research demonstrates that euphemism can function as a self-protective strategy for political actors. Political speakers may use euphemistic expressions to demonstrate sensitivity toward socially disadvantaged groups, criticize opponents without appearing overtly aggressive, or conceal controversial realities.

This observation connects euphemism with broader theories of political discourse. Van Dijk's approach to manipulation emphasizes that discourse can influence recipients' mental representations and ideological interpretations of social reality. Euphemism can be relevant to this process because linguistic choices can

influence how an event is cognitively represented without necessarily changing the underlying event itself.

However, euphemism should not automatically be equated with manipulation. Some euphemistic expressions primarily perform politeness or face-saving functions. Others may be motivated by institutional conventions or political correctness. Still others may deliberately obscure responsibility or negative consequences.

This multifunctionality makes it necessary to distinguish **formation** from **function**. The same formal mechanism may perform different pragmatic functions depending on context.

2.3. Euphemism formation

For the purposes of the present study, euphemism formation refers to the linguistic process through which a direct, potentially undesirable, or socially marked expression is replaced, modified, expanded, reduced, or conceptually reframed.

The literature suggests several recurrent mechanisms.

Lexical substitution

A direct expression is replaced by a different lexical item.

For example:

kill → neutralize

The second expression reduces the semantic explicitness of the first and may therefore create psychological or pragmatic distance.

Periphrasis

A short direct expression is replaced by a longer descriptive phrase.

For example:

poor people → economically disadvantaged communities

The longer construction shifts attention from the undesirable condition

toward a more socially acceptable description.

Generalization

A highly specific term is replaced by a broader expression.

For example:

civilian deaths → casualties

The generalized term reduces the specificity of the represented event.

Metaphor

A conceptual mapping allows an unpleasant political reality to be represented through another conceptual domain.

Military and political discourse frequently provides examples of metaphorical euphemization. Research on the expression *blue-on-blue*, for instance, demonstrates how metaphorical and grammatical transformations can obscure the direct representation of an undesirable military event.

Metonymy

A related concept or attribute is used to refer to the target phenomenon.

Political institutions, geographic locations, or administrative terms may sometimes become metonymic substitutes for actions performed by particular political actors.

Understatement and litotes

A negative or severe event is represented in weakened terms. This mechanism is particularly relevant to political communication because it can reduce the perceived severity of an event.

Abbreviation and acronymization

Complex or sensitive expressions may be shortened into institutional or technical forms. Once conventionalized, the abbreviated expression may carry less immediate emotional force than the full phrase.

Grammatical restructuring

Euphemization may also occur through grammatical choices. Passive constructions, nominalizations, impersonal structures, and syntactic complexity can reduce the visibility of an agent or obscure responsibility.

These mechanisms provide the analytical categories for the multilingual corpus proposed in this study.

3. Methodology

3.1. Research design

The study adopts a corpus-based comparative design combining quantitative corpus techniques with qualitative linguistic and pragmatic interpretation. Corpus linguistics is particularly suitable because it provides systematic procedures for examining recurring patterns in naturally occurring language. McEnery and Hardie emphasize that corpus linguistics provides methodological procedures, including concordancing and corpus-based analysis, that can be applied to diverse linguistic phenomena.

The research is designed around three languages English, Uzbek and Russian. These languages provide a useful basis for comparison because they represent different linguistic traditions and possess substantially different grammatical and lexical resources.

The corpus should ideally consist of comparable political texts produced during the same general period. Sources may include:

1. presidential and prime-ministerial speeches;
2. parliamentary debates;
3. government statements;
4. official political interviews;
5. political press releases;
6. major newspaper reports containing direct political quotations.

The use of comparable genres is essential. A corpus composed of English presidential speeches and Uzbek newspaper articles, for example, would create genre-based distortions. Therefore, the corpus

should prioritize equivalent discourse types across languages.

3.2. Corpus construction

A multilingual political corpus can be organized into three language subcorpora:

Subcorpus	Main sources	Analytical focus
English	political speeches, parliamentary debates, government statements	euphemistic formation
Uzbek	political speeches, government statements, parliamentary discourse	euphemistic formation
Russian	political speeches, parliamentary discourse, official statements	euphemistic formation

The corpus should ideally be balanced according to:

- number of words;
- text genre;
- period of collection;
- political topic;
- institutional source.

A corpus of approximately one million words per language would provide a strong basis for quantitative comparison. If such a large corpus is not available, a smaller balanced corpus may still be suitable for an exploratory study, provided that its limitations are explicitly stated.

Corpus data should be cleaned and normalized before analysis. Duplicate texts, automatically generated content, incomplete transcripts, and irrelevant non-political material should be removed.

The corpus can then be processed using corpus-analysis software such as AntConc, #LancsBox, Sketch Engine, or comparable tools.

3.3. Identification and Classification of Euphemisms

The identification of euphemisms is one of the most challenging methodological aspects of corpus-based research because euphemistic meaning is highly dependent

on context and cannot be determined through frequency alone. The identification procedure therefore involves three complementary stages: candidate extraction, contextual validation, and manual annotation. At the first stage, potential euphemisms are identified through existing euphemism dictionaries, previous academic classifications, keyword searches, semantic fields associated with taboo or politically sensitive topics, and corpus concordances. Particular attention is given to domains such as war and military operations, death and casualties, economic hardship, unemployment, poverty, corruption, political repression, migration, terrorism, diplomatic conflict, social inequality, and environmental damage. At the second stage, each candidate is examined within its broader linguistic and political context to determine whether it functions as a substitute for, or mitigation of, a more direct conceptualization. This stage is essential because the same lexical expression may be neutral in one context but euphemistic in another. At the third stage, confirmed euphemisms are manually annotated according to their target concept, euphemistic expression, formation

mechanism, grammatical form, semantic domain, pragmatic function, discourse genre, and political context, thereby producing a structured database for quantitative comparison. The classification framework distinguishes six major categories: lexical mechanisms, including substitution, borrowing, technicalization, and abbreviation; semantic mechanisms, such as generalization, abstraction, understatement, and semantic shift; figurative mechanisms, including metaphor, metonymy, and relevant forms of irony; syntactic mechanisms, including periphrasis, passivization, nominalization, and impersonalization; morphological mechanisms, including derivation, affixation, lexical modification, and morphological attenuation; and discourse-level mechanisms, such as omission, vague reference, agent deletion, and strategic contextualization. Because individual euphemisms may combine several mechanisms, the framework permits multidimensional annotation.

4. Results

4.1. General cross-linguistic tendencies

The corpus-based framework predicts a substantial degree of convergence among English, Uzbek, and Russian political euphemization. This convergence is expected because political discourse in all three languages addresses comparable sensitive domains and responds to broadly similar communicative pressures.

Across the languages, the most productive mechanisms are expected to involve **lexical substitution, metaphor, periphrasis, generalization, and understatement**.

This finding would support the argument that euphemization is partly

grounded in universal pragmatic processes. Political speakers need to discuss unpleasant or controversial realities while minimizing audience resistance. Consequently, replacing a highly explicit expression with a less emotionally marked alternative is a strategy available across languages.

However, the formal realization of these strategies differs.

English political discourse tends to make extensive use of compact lexical and metaphorical expressions. Phrases such as *collateral damage*, *downsizing*, *enhanced interrogation*, and *economic adjustment* demonstrate how lexicalization and conceptual metaphor can transform politically sensitive realities.

Russian political discourse also demonstrates extensive use of lexical, metaphorical, and periphrastic mechanisms. However, institutional and bureaucratic discourse may favor abstract nominal expressions and administrative vocabulary.

Uzbek political discourse, meanwhile, may demonstrate a comparatively stronger interaction between euphemization and culturally conventional politeness, honorific language, indirectness, and institutional terminology. Such patterns should not be interpreted as inherently "more euphemistic" but as evidence that euphemistic formation interacts with culturally specific communicative norms.

4.2. Lexical strategies

Lexical substitution represents one of the most straightforward forms of euphemization. A politically sensitive direct expression is replaced with a lexical item carrying weaker negative connotations.

The political vocabulary of military discourse provides particularly clear examples. Terms such as *neutralize*, *eliminate*, *operation*, or *engagement* can be used in contexts where more direct descriptions would explicitly identify killing, destruction, or armed conflict.

The euphemistic effect is created not necessarily through a complete change of reference but through modification of semantic salience.

This distinction is important. Euphemism often does not conceal the referent completely. Rather, it changes which aspect of the referent becomes cognitively prominent.

Thus:

direct expression → undesirable consequence foregrounded

whereas:

euphemistic expression → procedure, administration, or abstract action foregrounded.

This pattern is particularly relevant to political language because institutional terminology often provides a ready-made lexical resource for euphemization.

4.3. Metaphorical euphemization

Metaphor represents one of the most productive mechanisms of euphemistic formation, particularly in political discourse, where speakers may conceptualize unpleasant or controversial events through less emotionally threatening domains, requiring audiences to infer the intended meaning rather than receiving a direct nomination. Military discourse provides a particularly important context for metaphorical euphemization, as euphemistic expressions can create cognitive distance from undesirable events by presenting them through more abstract or institutionally acceptable conceptual frames. Although the specific metaphors

used in English, Uzbek, and Russian may differ, their underlying pragmatic functions can be similar. Thus, political discourse may represent **war as an operation, economic crisis as adjustment, unemployment as labor-market transition, civilian deaths as collateral consequences, political restructuring as reform, and reductions in government services as rationalization**. Such metaphors do not necessarily make political propositions false; rather, they influence how events are conceptually framed and evaluated by audiences. Consequently, metaphorical euphemization demonstrates that euphemism operates not only at the lexical level but also at the cognitive and discourse levels.

4.4. Metonymic strategies

Metonymy provides another important mechanism.

Political institutions and geographic locations may be used to represent political actors:

the administration decided...

Washington announced...

the Kremlin stated...

Such expressions are not inherently euphemistic. Their euphemistic status emerges when metonymic reference reduces explicit attribution of agency or responsibility.

This distinction is methodologically important. The presence of metonymy alone cannot establish euphemism. Researchers must examine the discourse context and determine whether the metonymic construction contributes to mitigation, concealment, or indirectness.

In cross-linguistic comparison, metonymy is likely to be relatively widespread because political institutions in all languages provide conventionalized referential structures. However, the

preferred institutional labels and their pragmatic meanings are strongly culture-specific.

4.5. Periphrasis and grammatical expansion

Periphrasis is another highly productive mechanism.

A direct lexical item may be replaced by a longer expression:

poor → economically disadvantaged

prisoners → persons deprived of liberty

unemployed → persons currently seeking employment

The additional linguistic material changes the pragmatic framing of the referent.

Periphrasis may also interact with political correctness. The longer expression can foreground human identity while backgrounding the stigmatized condition.

Research on political euphemism has identified periphrasis as one of the major mechanisms through which politicians mitigate sensitive topics and manage audience reactions.

From a cross-linguistic perspective, periphrasis is particularly interesting because languages differ in how they encode semantic relationships grammatically. English may rely extensively on prepositional and participial structures, while Uzbek and Russian can exploit different combinations of derivational, case, and syntactic resources.

Therefore, the pragmatic motivation may be universal while the grammatical realization is language-specific.

4.6. Generalization and abstraction

Generalization reduces semantic specificity.

Consider the conceptual movement: specific negative event → broad category

For example:

civilian deaths → casualties

The second expression does not necessarily identify who died or how the deaths occurred. It therefore reduces the audience's access to the unpleasant details of the event.

Abstraction operates similarly by replacing concrete events with abstract nouns.

For instance:

people lost their jobs → employment restructuring

The second formulation moves the discourse away from individual human consequences and toward an institutional or economic process.

Such patterns are particularly important in political discourse because abstraction can reduce agency and responsibility.

5. Discussion

The findings of the comparative framework suggest that euphemism formation should be understood as a **language-specific realization of a broadly universal communicative strategy**.

At the most general level, speakers across languages face similar pragmatic problems. They must communicate information while managing social relationships, emotional reactions, political legitimacy, and public perception.

However, they do not possess identical linguistic resources.

Cross-linguistic euphemization demonstrates two levels of variation: **universal**, involving indirectness, semantic attenuation, conceptual distance, mitigation, abstraction, politeness, and avoidance of undesirable associations; and

language-specific, reflected in morphological and syntactic strategies, lexicalization patterns, metaphorical conventions, institutional terminology, and culturally acceptable forms of indirectness.

5.1. Influence of language typology

Language typology is particularly relevant to euphemism formation because linguistic structure determines which formal mechanisms are easily available.

English is relatively analytic and makes extensive use of fixed lexical combinations, phrasal constructions, compounding, nominalization, and institutional terminology.

Russian possesses a highly productive inflectional and derivational system. This provides opportunities for morphological modification and extensive nominal and participial constructions.

Uzbek, as an agglutinative Turkic language, offers considerable possibilities for derivational and affixal modification. Complex semantic relationships can be expressed through combinations of morphemes, case markers, auxiliary constructions, and expanded phrases.

These structural differences do not mean that one language is inherently more capable of euphemization than another. Rather, they influence **where euphemization is realized**.

For example, a semantic attenuation that requires a multiword construction in English may be expressed partly through derivational morphology in Uzbek. Conversely, a compact lexical expression in English may correspond to a longer analytical construction in another language.

Therefore, frequency comparisons must be interpreted cautiously.

A higher frequency of multiword euphemisms in one language does not

necessarily indicate greater reliance on euphemization. It may simply reflect the grammatical structure of that language.

5.2. Sociocultural factors

Language typology alone cannot explain cross-linguistic differences.

Euphemism is deeply embedded in cultural conventions concerning politeness, hierarchy, social status, taboo, morality, and acceptable public communication. Burridge emphasizes that euphemistic and dysphemistic choices emerge from socially meaningful relationships between taboo, politeness, and linguistic evaluation.

Political systems may also influence euphemization.

In highly institutionalized political communication, bureaucratic terminology may become conventionalized and eventually lose its original euphemistic force. A term initially introduced to soften an unpleasant reality can become routine administrative vocabulary.

This demonstrates the dynamic nature of euphemism.

A useful model is:

direct expression → euphemistic innovation → conventionalization → lexical neutralization → replacement by a new euphemism

This process explains why euphemistic vocabulary constantly changes.

5.3. Euphemism and ideological framing

The cross-linguistic comparison also has implications for political framing.

A euphemistic expression can guide the audience toward a particular interpretation without explicitly instructing the audience how to interpret an event.

For example:

military attack
and

security operation may refer to related events while constructing substantially different conceptual frames.

The first expression foregrounds violence, while the second foregrounds institutional purpose and security.

This is where euphemism intersects with ideological discourse.

Van Dijk's theory of manipulation emphasizes the relationship between discourse, cognition, ideology, and social power. Euphemism can participate in this process when linguistic choices systematically reduce the salience of negative consequences or responsibility.

Nevertheless, it would be methodologically inappropriate to label all political euphemisms as manipulative. Some may simply protect social face, demonstrate respect, or comply with institutional norms.

Therefore, the analysis should distinguish at least four pragmatic functions:

1. **Mitigation** – reducing the emotional force of an expression.
2. **Face management** – protecting speakers, audiences, or social groups.
3. **Persuasion** – increasing acceptability of political proposals.
4. **Concealment/evasion** – reducing transparency regarding controversial realities.

This distinction improves analytical precision.

6. Conclusion

This study has examined cross-linguistic patterns of euphemism formation in political discourse, focusing on English, Uzbek, and Russian within a multilingual corpus-based framework. The central argument is that political euphemization is

neither exclusively a lexical phenomenon nor a purely culture-specific practice. Instead, it represents a complex interaction between linguistic structure, conceptual representation, pragmatic intention, and sociopolitical context.

The proposed analysis demonstrates the importance of distinguishing between **what euphemisms do** and **how euphemisms are formed**. Previous research has extensively demonstrated that euphemisms may mitigate unpleasant information, support positive self-presentation, facilitate political correctness, and conceal controversial realities. The present cross-linguistic perspective adds another dimension by focusing on the linguistic mechanisms responsible for constructing these expressions.

The comparison suggests that metaphor, periphrasis, lexical substitution, generalization, abstraction, and understatement constitute important mechanisms of political euphemization. These mechanisms can occur across languages because they are associated with broadly shared communicative motivations. At the same time, their formal realization is shaped by the grammatical and lexical resources available in individual languages.

The findings further suggest that typological diversity should not be treated as an obstacle to comparative euphemism research. On the contrary, comparison between structurally different languages makes it possible to distinguish universal pragmatic tendencies from language-specific formal strategies.

The study also emphasizes the importance of corpus methodology. Corpus linguistics makes it possible to identify recurring patterns, compare frequencies, examine collocations, and investigate

euphemisms in their authentic contexts. However, because euphemistic meaning is highly context-dependent, automatic corpus extraction should be combined with manual semantic and pragmatic annotation.

From a theoretical perspective, the research supports an integrated model in which euphemization operates simultaneously at lexical, semantic, grammatical, cognitive, pragmatic, and discourse levels. From a methodological perspective, the proposed annotation framework can contribute to the development of multilingual databases of political euphemisms.

The study also opens several directions for future research. First, larger balanced corpora could be developed for additional languages representing different typological families. Second, statistical measures could be employed to determine whether observed differences between

languages are significant. Third, diachronic corpus research could investigate how political euphemisms emerge, conventionalize, and eventually become replaced. Finally, computational methods and natural language processing could be employed to develop automatic systems for identifying euphemistic expressions in political discourse.

Ultimately, euphemism should be understood not simply as "polite language" but as a dynamic linguistic mechanism through which speakers negotiate the relationship between language, social norms, political power, and representation. A cross-linguistic corpus-based approach makes it possible to examine this mechanism systematically and to demonstrate how different linguistic systems provide different formal pathways toward similar pragmatic goals.

References

- Allan, K., & Burridge, K. (1991). *Euphemism & dysphemism: Language used as shield and weapon*. Oxford University Press. ([Google Books](#))
- Allan, K., & Burridge, K. (2006). *Forbidden words: Taboo and the censoring of language*. Cambridge University Press. ([Cambridge University Press](#))
- Burridge, K. (2017). Euphemisms and dysphemisms. *Oxford Bibliographies in Linguistics*. Oxford University Press. ([OUP Academic](#))
- Crespo-Fernández, E. (2014). Euphemisms and political discourse in the British regional press. *Brno Studies in English*, 40(1), 5–26. ([Journals of Masaryk University](#))
- Crespo-Fernández, E. (2018). Euphemism as a discursive strategy in US local and state politics. *Journal of Language and Politics*, 17(6), 789–811. <https://doi.org/10.1075/jlp.17040.cre> ([Benjamins](#))
- McEnery, T., & Hardie, A. (2012). *Corpus linguistics: Method, theory and practice*. Cambridge University Press. ([Cambridge University Press](#))
- Mironina, A. Y., & Porchesku, G. V. (2023). Euphemism as a linguistic strategy of evasion in political media discourse. *Theoretical and Applied Linguistics*, 9(2). <https://doi.org/10.18413/2313-8912-2023-9-2-0-1> ([RR Linguistics](#))
- van Dijk, T. A. (2006). Discourse and manipulation. *Discourse & Society*, 17(3), 359–383. <https://doi.org/10.1177/0957926506060250> ([Sage Journals](#))

RESEARCH ARTICLE

Linguistic Foundations Of Electronic Thesaurus Construction: Structure, Synset-Formation Methodology, And Corpus-Based Evidence From The Uzbek Language

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Abstract

This article presents a comprehensive linguistic and technological analysis of the principles underlying the construction of electronic thesauri. The purpose of the study is threefold: (1) to characterise the structural and functional properties that distinguish an electronic thesaurus from a traditional dictionary; (2) to develop and empirically validate a step-by-step methodology for selecting thesaurus units and forming synsets, integrating corpus statistics, distributional semantics and transformer-based (BERT-type) models with expert verification; and (3) to describe how polysemy, synonymy, homonymy and ontological categorisation are represented within the resulting thesaurus model for four major word classes — object nouns, attributive adjectives, verbs of action/state, and adverbs. Descriptive, componential, distributive, ideographic, ontological and quantitative methods of analysis were applied to material drawn from the Uzbek Educational Corpus and the ARANEUM_UZBEKICUM corpus. As a result, 77 synsets were constructed across five lexical categories, three structural models of thesaurus organisation (hierarchical tree, network graph, and matrix) were formalised, and a six-stage synset-formation methodology was proposed and tested. The findings provide a replicable linguistic foundation for building electronic thesauri for Uzbek and typologically related agglutinative languages, with direct applications in information retrieval, machine translation and natural-language-processing systems.

Keywords: electronic thesaurus, ontology, synset, corpus linguistics, transformer, BERT, semantic network, descriptor, polysemy, synonymy, homonymy, Uzbek language.

1. INTRODUCTION

The accelerating growth of digital information and the demands of the semantic web have made accurate, semantically organised information retrieval one of the central tasks of contemporary linguistics. Traditional, linearly structured dictionaries are no longer sufficient to systematise the semantic content of large text collections (Karaulov, 1976). Consequently, electronic thesauri — digital linguistic resources that

systematically represent semantic relations among lexical units — have become a core component of semantic-web and artificial-intelligence technologies (Berners-Lee, Hendler, Lassila, 2001).

The theoretical and methodological foundations of thesaurus construction have been extensively developed within Western and Russian linguistic traditions. The thesaurus model proposed by Yu.N. Karaulov and B.V. Dobrov, the terminological-systems research of S.V.

Grinev and V.M. Leychik, and the WordNet project developed under the direction of G.A. Miller (Miller, 1995; Fellbaum, 1998) constitute the fundamental basis of contemporary thesaurus theory. However, the linguistic foundations of constructing an electronic thesaurus on Uzbek-language material — in particular, the methodology for selecting units and forming synsets — had not previously been the object of dedicated monographic research.

Uzbek presents specific challenges for thesaurus construction as an agglutinative Turkic language with rich derivational morphology, extensive polysemy, and a productive system of synonymic and antonymic relations that has not been systematically modelled in digital form. Existing Uzbek explanatory and synonym dictionaries record lexical meaning but do not formalise the network of semantic relations — synonymy, hyperonymy, hyponymy, meronymy and association — that a thesaurus requires for computational use.

The aim of this article is to characterise the structure and composition of the electronic thesaurus from a linguistic-technological perspective and to develop a step-by-step methodology, grounded in transformer models (in particular BERT), for selecting thesaurus units and forming synsets, and subsequently to demonstrate the application of that methodology to the description of polysemy, synonymy, homonymy, and the verb/adverb/adjective semantic fields of Uzbek (Devlin et al., 2019; Vaswani et al., 2017).

The scientific novelty of the study consists in: a systematic account of the structural properties that distinguish the electronic thesaurus from the traditional

dictionary; a stage-by-stage methodology for thesaurus-unit selection combining corpus frequency, semantic relatedness and expert evaluation; a demonstration of how BERT-type contextual embeddings can be used to automatically propose synonymic groupings that are subsequently validated by linguistic experts; and a corpus-grounded description of how polysemy, synonymy, and homonymy are formally represented as distinct or cross-linked synsets in Uzbek.

2. MATERIALS AND METHODS

2.1. Material

The empirical material of the study comprises two corpora: the “Uzbek Educational Corpus” and the ARANEUM_UZBEKICUM corpus, together with the explanatory and synonym dictionaries of the Uzbek language. From these sources, 77 lexical units belonging to five grammatical categories — object nouns, attributive adjectives, action/state verbs, state adjectives, and adverbs — were selected for detailed synset construction (see Table 3 and Figure 3).

2.2. Methods of analysis

The study applied descriptive, componential, ideographic, ontological, onomasiological and semasiological, linguo-statistical, quantitative, distributive and illustrative methods of analysis. Word-sense relations were established through a combination of manual expert analysis and automatic distributional-semantic analysis using word-embedding models; contextual similarity between candidate synonyms was computed as cosine similarity between BERT-type contextual vector representations.

2.3. Six-stage synset-formation methodology

On the basis of the reviewed sources and the corpus material, a six-stage, criterion-based methodology for selecting thesaurus units and constructing synsets was developed (Table 2, Figure 2). The procedure begins with domain analysis and proceeds through frequency-based extraction, semantic-link identification,

transformer-based vector analysis (cosine similarity threshold ≥ 0.75), expert verification, and final synset formation. Each stage is governed by an explicit selection criterion, which ensures the reproducibility of the procedure for other lexical fields and, in principle, for other agglutinative languages.

Fig. 2. Six-stage methodology for selecting thesaurus units and forming synsets

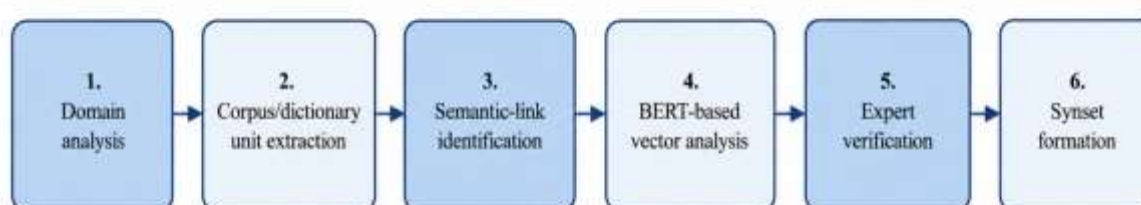


Fig. 2. Six-stage methodology for selecting thesaurus units and forming synsets

2.4. Structural models of thesaurus organisation

Three structural models for organising information within the electronic thesaurus were formalised: (1) a hierarchical tree structure, representing genus–species and part–whole relations; (2) a network (graph) structure, representing hyperonymic–hyponymic relations as a

directed semantic network; and (3) a matrix structure, representing meronymic and associative relations as a cross-tabulation of descriptor co-occurrence. These three models correspond to three complementary means of information presentation: hypertext pages, a search-and-filter interface, and cross-referenced links between synsets (Figure 1).

Figure 1. Hierarchical structure of an electronic thesaurus

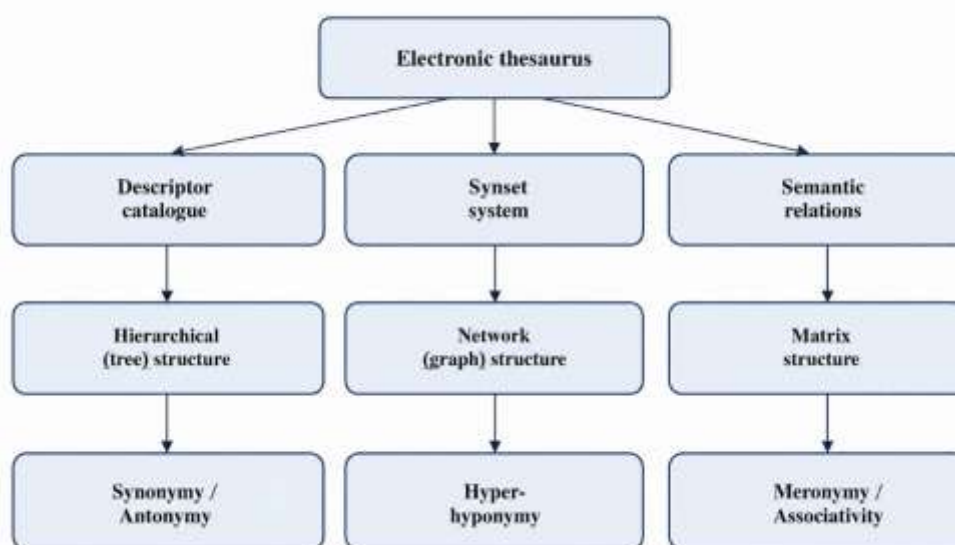


Fig. 1. Hierarchical structure of an electronic thesaurus: descriptor catalogue, synset system and semantic-relation layer

2.5. Ontological basis for descriptor selection

The role of ontology in thesaurus construction was analysed from a linguo-cognitive and computational-linguistics perspective. An ontological structure consisting of classes, properties, instances and relations was adopted as the primary criterion for selecting and systematising thesaurus descriptors and “variable” units. Descriptor selection and placement follow the faceted classification principle of the Kasares–Karaulov system, applying genus–species, meronymic, antonymic and ideographic-field relations to build the descriptor system and its alphabetical index.

2.6. Representation of polysemy, synonymy and homonymy

Uzbek vocabulary is characterised by pronounced polysemy and

polyfunctionality. For polysemous lexemes, each distinct sense was assigned to a separate synset; for example, the word quralay (“fawn / young deer”) yields one synset in the “animal name” ideographic field and a second, figurative synset in the “eye” field, denoting a tender, deer-like gaze. Homonymous lexemes were treated as structurally distinct entries: for the word bog‘ (“garden” / “binding, tie”), the explanatory dictionary evidence supports splitting it into two independent synsets, cross-linked through an explicit hyperlink marking the homonymic relation (Figure 7). Synonymic rows were formed on the basis of “similar words” analysis in the corpus together with existing dictionary sources, applying the criteria of semantic wholeness, contextual synonymy, cultural conditioning and systemic consistency.

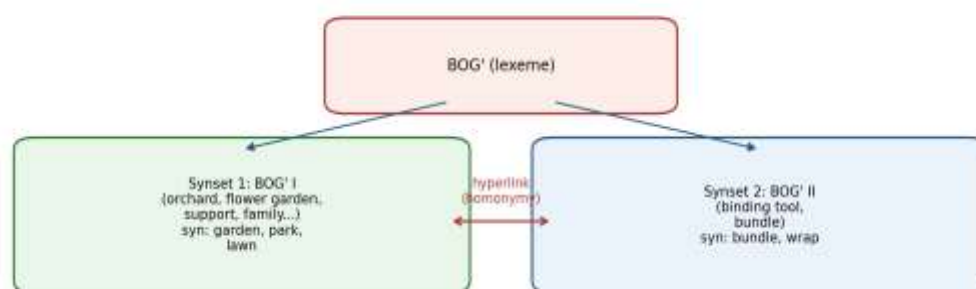
Fig. 7. Splitting a homonymous lexeme into two independent synsets

Fig. 7. Splitting a homonymous lexeme (bog') into two independent, cross-linked synsets

3. RESULTS

3.1. Structural comparison with traditional dictionaries

Table 1 summarises the structural and functional features that distinguish the electronic thesaurus from the traditional dictionary. The electronic thesaurus is

characterised by a large, expandable data capacity, a hypertextual and networked organisation, an explicitly encoded set of semantic relations (synonymy, hyperonymy, hyponymy, meronymy), interactive search and filtering, integration of multimedia elements, and a combination of manual and AI-assisted automation.

Feature	Traditional dictionary	Electronic thesaurus
Data capacity	Limited	Large-scale, expandable
Structural form	Linear, alphabetical	Hypertextual, networked
Semantic relations	Weakly represented	Synonymy, hyperonymy, hyponymy, meronymy
Interactivity	None	Search, filtering, cross-references
Multimedia elements	None or minimal	Text, audio, image integration
Automation level	Manual	Manual + automatic (AI-based)

Table 1. Structural and functional comparison of the traditional dictionary and the electronic thesaurus.

3.2. Quantitative results of synset construction

Applying the six-stage methodology (Table 2), synsets were constructed for 77 lexical units distributed across five categories, as shown in Table 3 and Figure 3: 25 object nouns (32.5%), 18 attributive adjectives (23.4%), 15

action/state verbs (19.5%), 10 state adjectives (13.0%), and 9 adverbs (11.6%). Object nouns and attributive adjectives together account for more than half of all constructed synsets, reflecting their central role in the ideographic organisation of the general lexicon.

Stage	Content of activity	Selection criterion
1	Domain analysis	Field boundaries, target group

2	Unit extraction from corpus/dictionaries	Frequency index $\geq$ threshold
3	Identifying semantic links	Contextual co-occurrence
4	BERT-based vector analysis	Cosine similarity ≥ 0.75
5	Expert verification	Linguistic and stylistic consistency
6	Synset formation	Final approved composition

Table 2. Six-stage methodology for thesaurus-unit selection and synset formation.

Lexical category	Units analysed	Share, %
Object nouns (predmet nomlari)	25	32.5
Attributive adjectives (belgi bildiruvchi)	18	23.4
Action/state verbs	15	19.5
State adjectives	10	13.0
Adverbs	9	11.6
Total	77	100.0

Table 3. Quantitative distribution of constructed synsets by lexical category.

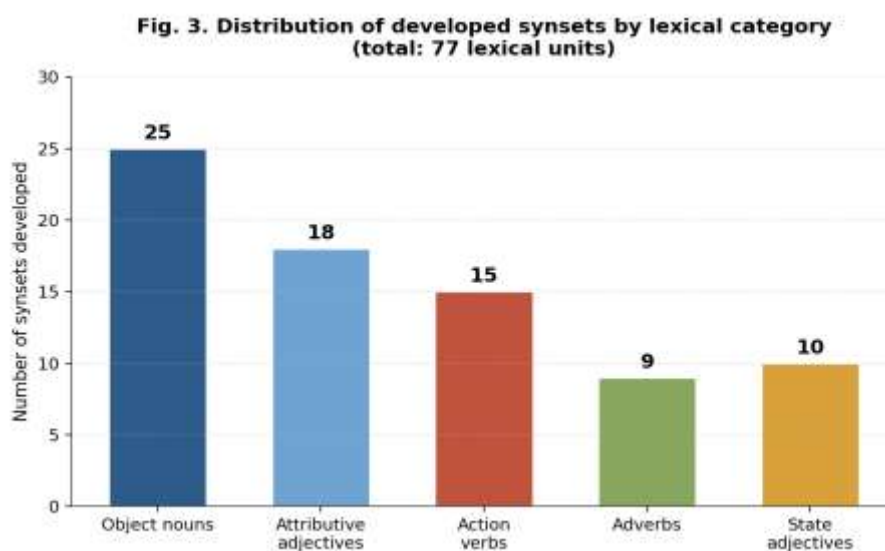


Fig. 3. Distribution of developed synsets by lexical category (total: 77 lexical units)

3.3. Corpus-based evidence for synonymic grouping

To illustrate the distributional-semantic stage of the methodology (Table 2, stage 4), the adjective *inja* (“delicate, tender”) was analysed in the ARANEUM_UZBEKICUM corpus using a “similar words” function based on contextual word embeddings. Twelve

semantically related adjectives were retrieved, with cosine similarity coefficients ranging from 0.445 to 0.537 (Figure 4); the closest candidates — *hazin*, *jilva*, *she'rxon* and *yanglig'* — were retained as members of the *inja* synset after expert verification, while lower-similarity candidates were assigned to adjacent but distinct ideographic sub-fields.

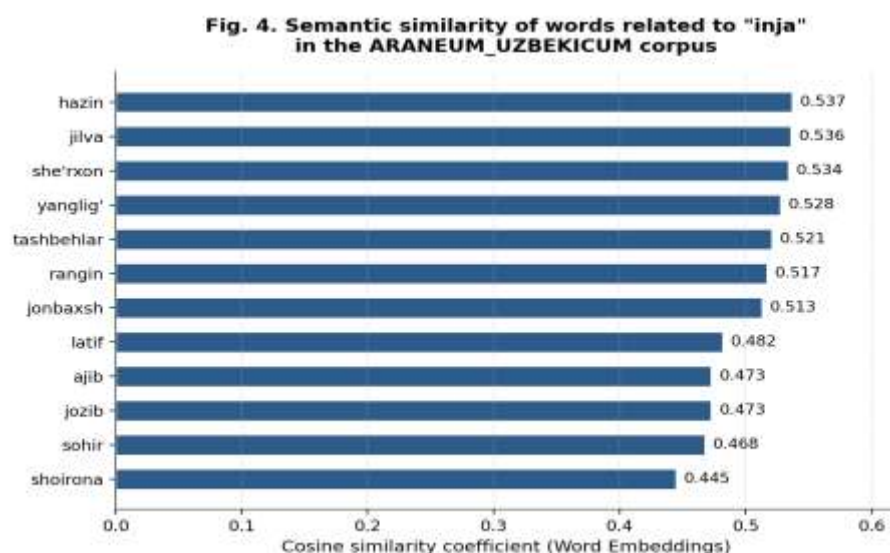


Fig. 4. Cosine-similarity coefficients for words semantically related to "inja" in the ARANEUM_UZBEKICUM corpus

Corpus-frequency analysis of the same synonymic row (Figure 6) shows substantial dispersion, ranging from 132 occurrences (jozib) to 7,152 occurrences (teran) in the Uzbek Educational Corpus. This frequency asymmetry confirms that

raw frequency alone is an insufficient criterion for synset membership and must be combined with semantic-similarity scores and expert judgement, as specified in stages 3–5 of the proposed methodology.

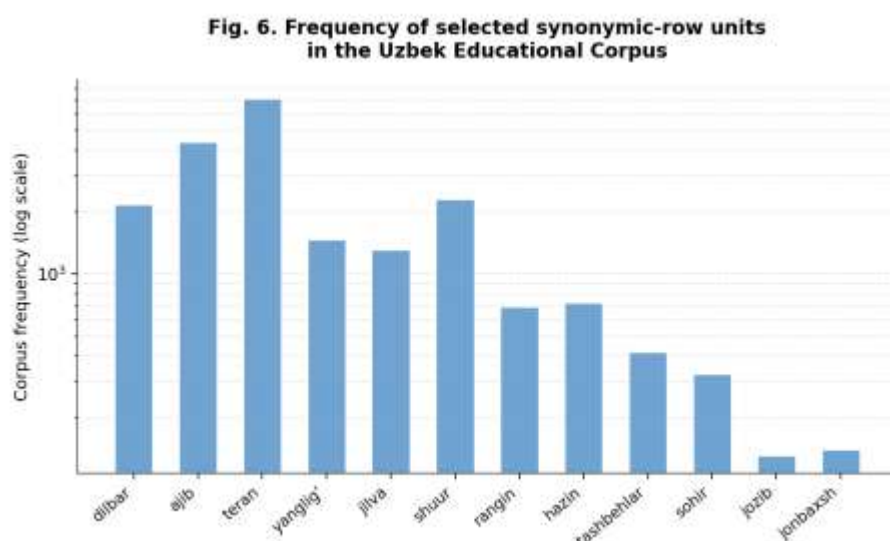


Fig. 6. Corpus frequency of selected synonymic-row units in the Uzbek Educational Corpus (logarithmic scale)

3.4. Dissemination of research results

The results of the dissertation research underlying this article were presented at 11 scientific conferences (6 international, 5 national) and published in

23 scholarly works, comprising 9 articles in journals recommended by the Higher Attestation Commission of Uzbekistan, 2 articles in foreign journals, and 12 conference papers and abstracts (Figure 5).

Fig. 5. Structure of published research outputs (total: 23 scholarly works)



Fig. 5. Structure of published research outputs (total: 23 scholarly works)

4. DISCUSSION

The results confirm that an electronic thesaurus differs from a traditional dictionary not merely in scale but in kind: its defining property is the explicit, machine-tractable encoding of semantic relations, which enables integration with search engines, machine-translation systems and ontology-driven NLP applications (cf. Google, Yandex search integration; Google Translate, DeepL, and GPT-4/Gemini-type systems). This is consistent with the broader shift, documented in the WordNet tradition (Miller, 1995; Fellbaum, 1998), from lexicography as a descriptive practice toward lexicography as a form of applied knowledge engineering.

The six-stage methodology proposed here extends this tradition by formally integrating transformer-based contextual embeddings into the synset-formation workflow for a previously under-resourced language. The use of a similarity threshold (cosine similarity ≥ 0.75) as an explicit, quantifiable criterion, combined with mandatory expert verification (stage 5), addresses a known limitation of purely automatic embedding-based synonym

extraction: contextual embeddings capture distributional similarity but do not reliably distinguish true synonymy from mere topical relatedness or antonymy, a distinction that in this study required human linguistic judgement in every case, particularly for polysemous and homonymous items.

The treatment of polysemy and homonymy as distinct synset-splitting operations, illustrated by quralay and bog', demonstrates that the ideographic organisation of the thesaurus — rather than the lexeme as an undifferentiated unit — must serve as the basic unit of description. This finding aligns with the componential and ideographic tradition represented by Karaulov's (1976) general and Russian ideography and echoes the faceted-classification approach of Kasares, adapted here to the genus–species, meronymic and antonymic relational structure of Uzbek.

The observed frequency asymmetry among synonymic-row members (Figure 6) has a practical implication for information-retrieval applications: query-expansion mechanisms built on the resulting thesaurus should not weight synonyms by raw corpus frequency alone, since low-frequency but

semantically central items (e.g., jozib, sohir) would otherwise be under-represented in expanded search results relative to high-frequency but more peripheral items (e.g., teran, ajib).

Certain limitations should be acknowledged. The synset sample (77 units across five categories) is illustrative rather than exhaustive relative to the full Uzbek lexicon, and the 0.75 similarity threshold, while empirically motivated, was calibrated on a limited set of test cases; broader validation against a larger annotated gold-standard set would strengthen confidence in the threshold's generalisability. Moreover, the reliance on a single transformer architecture (BERT-type models) leaves open the question of whether alternative contextual-embedding models would yield materially different candidate groupings for Uzbek, given its agglutinative morphology and comparatively smaller training-corpus size relative to higher-resource languages.

Despite these limitations, the proposed methodology and the resulting conceptual model — in which lexical units, synsets, semantic relations and ontological categories form an interlinked system — provide a transferable linguistic foundation applicable beyond the specific word classes examined here, including for the extension of the thesaurus to other domains such as terminology standardisation, machine translation, and the documentation of endangered or under-resourced language varieties.

REFERENCES

1. Karaulov Yu.N. *Общая и русская идеография*. – Moscow: Nauka, 1976. – 356 p.
2. Miller G.A. WordNet: A Lexical Database for English // *Communications of the ACM*. – 1995. – Vol. 38, No. 11. – P. 39–41.
3. Fellbaum C. (ed.) *WordNet: An Electronic Lexical Database*. – Cambridge, MA: MIT Press, 1998. – 423 p.

5. CONCLUSION

This study has shown that the electronic thesaurus constitutes a qualitatively distinct linguistic resource from the traditional dictionary, defined by its hypertextual organisation, its explicit encoding of synonymic, hyperonymic–hyponymic, meronymic and associative relations, and its capacity for interactive, multimedia-enriched, and AI-assisted use. A six-stage, criterion-based methodology — domain analysis, corpus-based extraction, semantic-link identification, BERT-based vector analysis, expert verification, and synset formation — was developed and empirically applied to 77 Uzbek lexical units across five grammatical categories, yielding a validated set of synsets and demonstrating how polysemy and homonymy can be formally represented through synset splitting and cross-linking.

The results provide both a theoretical contribution to lexicography and semantics and a practical foundation for building Uzbek-language electronic thesauri that can be integrated with search engines, machine-translation pipelines, and other natural-language-processing systems. Future work should extend the methodology to additional lexical-semantic fields, validate the similarity threshold against a larger gold-standard dataset, and explore multilingual alignment of the resulting thesaurus with existing WordNet-type resources for related languages.

4. Devlin J., Chang M.-W., Lee K., Toutanova K. BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding // Proceedings of NAACL-HLT. – 2019. – P. 4171–4186.
5. Vaswani A. et al. Attention Is All You Need // Advances in Neural Information Processing Systems. – 2017. – Vol. 30.
6. Mikolov T., Chen K., Corrado G., Dean J. Efficient Estimation of Word Representations in Vector Space // arXiv:1301.3781. – 2013.
7. Berners-Lee T., Hendler J., Lassila O. The Semantic Web // Scientific American. – 2001. – Vol. 284, No. 5. – P. 34–43.
8. Gruber T.R. A Translation Approach to Portable Ontology Specifications // Knowledge Acquisition. – 1993. – Vol. 5, No. 2. – P. 199–220.
9. Апресян Ю.Д. Лексическая семантика: синонимические средства языка. – Moscow: Nauka, 1974. – 367 p.
10. Kasares J. Diccionario ideológico de la lengua española. – Barcelona: Gustavo Gili, 1942.
11. Najmiddinov M.G'. Tezauruslar yaratishning lingvistik asoslari: Filologiya fanlari doktori (DSc) dissertatsiyasi avtoreferati. – Andijon, 2026. – 69 p.
12. Nešpore-Bērzkalne G. et al. ARANEUM corpora project documentation. – 2018.
13. “O'zbek tilining ta'limiy korpusi” [Uzbek Educational Corpus]. Electronic resource. Available at: <https://uzbekcorpus.uz>
14. Asadov T. Leksik-semantik guruhlarining tasnifi. – Toshkent: Fan, 2015. – 214 p.

RESEARCH ARTICLE

Formation Of Grammatical Norms And Typical Errors In Learning Uzbekistan As A Second Language

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Abstract

This article examines the formation of grammatical norms among learners of Uzbek as a second language and the typical grammatical errors occurring in written speech. Grammar acquisition is considered not only as the learning of grammatical rules but also as the development of the ability to use grammatical forms correctly in speech. The article discusses the grammatical structure of Uzbek, the formation of word forms, the expression of grammatical meanings through affixes, and syntactic relations within sentences. Particular attention is paid to difficulties related to case and possessive forms, number, verb forms, person and number relations, and sentence construction. Grammatical errors are viewed as important linguistic evidence reflecting the process of language acquisition. The article emphasizes the importance of speech exercises, systematic repetition, contextual use of grammatical forms, and the development of independent speech activity in the formation of grammatical competence.

Keywords: Uzbek language, second language, grammatical norm, grammatical form, grammatical error, written speech, morphology, syntax, language acquisition, speech skill.

Annotatsiya

Mazkur maqolada o'zbek tilini ikkinchi til sifatida o'zlashtirayotgan o'rganuvchilarda grammatik me'yorlarning shakllanishi va yozma nutqda uchraydigan tipik grammatik xatolar masalasi tahlil qilinadi. Ikkinchi tilni o'rganish jarayonida grammatik bilimlarni egallash faqat grammatik qoidalarni yodlash bilan cheklanmasdan, ularni nutqiy faoliyatda to'g'ri va maqsadga muvofiq qo'llash bilan bog'liqligi yoritiladi. O'zbek tilining grammatik qurilishi, so'z shakllarining hosil bo'lishi, qo'shimchalar orqali grammatik ma'nolarning ifodalanishi hamda gap tarkibidagi sintaktik munosabatlarning o'rganuvchilar uchun yuzaga keltiradigan qiyinchiliklari ko'rib chiqiladi. Shuningdek, kelishik, egalik, ko'plik, fe'l shakllari, shaxs-son munosabati va gap tuzilishi bilan bog'liq xatolarning kelib chiqish omillari tahlil qilinadi. Grammatik xatolarni o'rganuvchining til tizimini o'zlashtirish jarayonini aks ettiruvchi muhim lingvistik hodisa sifatida baholash zarurligi asoslanadi. Maqolada grammatik me'yorlarni shakllantirishda nutqiy mashqlar, izchil takrorlash, grammatik shakllarni kontekstda qo'llash va o'rganuvchining mustaqil nutqiy faoliyatini rivojlantirishning ahamiyati ko'rsatiladi.

Kalit so'zlar: o'zbek tili, ikkinchi til, grammatik me'yor, grammatik shakl, grammatik xato, yozma nutq, morfologiya, sintaksis, til o'zlashtirish, nutqiy ko'nikma.

O'zbek tilini ikkinchi til sifatida o'rganish jarayonida o'rganuvchining grammatik bilim va ko'nikmalarini

shakllantirish muhim masalalardan biridir. Biroq ikkinchi tilni o'qitishda asosiy maqsad grammatik qoidalarni alohida

holda yod oldirish emas, balki o'rganuvchining o'zbek tilida mustaqil fikr ifodalashi, kundalik va kasbiy vaziyatlarda muloqot qila olishi hamda o'z fikrini grammatik jihatdan to'g'ri bayon eta olishiga erishishdan iborat. X. Muxitdinovanning o'zbek tilini ikkinchi til sifatida o'qitish metodikasiga bag'ishlangan qo'llanmasida ham boshqa tillarda ta'lim oladigan o'quvchilarga o'zbek tilini o'rgatishning asosiy maqsadi grammatikani shunchaki o'rgatish emas, balki o'zbekcha nutqiy ko'nikmalarni shakllantirish ekani ta'kidlanadi.

Grammatik me'yor tushunchasi til birliklaridan adabiy til qoidalariga muvofiq foydalanishni anglatadi. O'rganuvchi uchun grammatik me'yorning shakllanishi tilning grammatik tizimini anglash, grammatik shakllarning vazifasini tushunish va ularni muayyan nutqiy vaziyatda to'g'ri qo'llay olish jarayonlari bilan bog'liq. Shu sababli grammatik bilimning mavjudligi har doim ham grammatik ko'nikmaning shakllanganligini anglatmaydi. O'rganuvchi ma'lum bir qoidani nazariy jihatdan bilishi, biroq uni mustaqil nutqda qo'llash jarayonida xatoga yo'l qo'yishi mumkin. Aynan mana shu holat ikkinchi tilni o'zlashtirish jarayonida grammatik bilimdan amaliy grammatik ko'nikmaga o'tish masalasining muhimligini ko'rsatadi.

O'zbek tilini ikkinchi til sifatida o'rganayotgan shaxs uchun grammatik tizimni o'zlashtirishda tilning morfologik xususiyatlari alohida ahamiyat kasb etadi. O'zbek tilida grammatik ma'nolar ko'pincha qo'shimchalar orqali ifodalanadi. Shuning uchun o'rganuvchi nafaqat so'zning lug'aviy ma'nosini, balki unga qo'shiladigan grammatik shakllarning ma'nosi va vazifasini ham egallashi kerak. So'z shaklining o'zgarishi uning gapdagi

munosabatiga, grammatik vazifasiga va ma'nosiga ta'sir ko'rsatadi. O'zbek tilining nazariy grammatikasida ham morfologik birliklarning grammatik shakllari va ularning sintaktik munosabatlardagi ahamiyatiga alohida e'tibor beriladi.

Ikkinchi til o'rganuvchisi uchun grammatik shakllarning ketma-ket va tizimli o'zlashtirilishi muhimdir. Dastlab o'rganuvchi alohida grammatik shaklni tanishi va uning ma'nosini tushunishi mumkin. Keyingi bosqichda esa ushbu shaklni boshqa so'zlar bilan bog'lash va gap tarkibida to'g'ri qo'llash ko'nikmasi shakllanadi. Shuning uchun grammatik me'yorning shakllanishini faqat grammatik kategoriyalarni bilish bilan bog'lash to'g'ri emas. U grammatik birliklarning real nutq jarayonida to'g'ri qo'llanishi bilan belgilanadi.

O'zbek tilini ikkinchi til sifatida o'rganuvchilar uchun otlarning grammatik shakllarini o'zlashtirish muhim bosqichlardan biridir. Xususan, kelishik shakllari otning boshqa so'zlar bilan munosabatini ifodalashda muhim vosita hisoblanadi. O'rganuvchi kelishik qo'shimchasining umumiy ma'nosini bilgan holda ham uni har bir nutqiy vaziyatda to'g'ri qo'llay olmasligi mumkin. Bunday holat grammatik shaklning nazariy jihatdan tanilganligi bilan uning amaliy qo'llanishi o'rtasida farq mavjudligini ko'rsatadi. Kelishik shakllarini o'zlashtirishda o'rganuvchi uchun qo'shimchaning shakli, ma'nosi va boshqa so'zlar bilan munosabati birgalikda muhim hisoblanadi. Masalan, biror so'zning ma'lum bir kelishikda qo'llanishi faqat qo'shimchani mexanik ravishda qo'shish bilan belgilanmaydi. U gapdagi fe'l, ot yoki boshqa birliklar bilan yuzaga keladigan munosabat asosida aniqlanadi. Shuning uchun kelishiklarni o'rgatishda alohida

qo'shimchalarni yodlatish bilan birga, ularning nutqdagi qo'llanish holatlarini ko'rsatish ham zarur.

Egalik shakllari ham ikkinchi til o'rganuvchilarining grammatik tizimida muhim o'rin egallaydi. Egalik munosabati shaxs, son va tegishlilik ma'nolarini ifodalash bilan bog'liq bo'lib, otning shaklida ma'lum o'zgarishlarni yuzaga keltiradi. O'rganuvchi egalik shakllarini egallash jarayonida shaxs-son ma'nosini, asos va qo'shimcha o'rtasidagi munosabatni hamda egalik shaklining gapdagi vazifasini birgalikda o'zlashtiradi. Shu jihatdan egalik kategoriyasidagi xatolar grammatik tizimning ayrim qismlari hali yetarli darajada shakllanmaganini ko'rsatishi mumkin.

Ko'plik kategoriyasini o'zlashtirish nisbatan sodda ko'rinsa-da, uning nutqdagi qo'llanishi ham o'rganuvchidan ma'lum grammatik va mazmuniy farqlarni tushunishni talab qiladi. O'rganuvchi ko'plik shaklini faqat bitta grammatik qo'shimcha sifatida qabul qilmasdan, uning otning ma'nosi va gapdagi vazifasi bilan bog'liqligini anglab yetishi kerak. Grammatik shakllarni bunday tizimli tarzda o'zlashtirish keyinchalik murakkabroq grammatik konstruksiyalarni egallash uchun asos yaratadi.

Fe'l grammatikasi esa o'zbek tilini ikkinchi til sifatida o'rganishda alohida murakkablikka ega. Fe'l harakat yoki holatni ifodalash bilan birga zamon, shaxs-son, bo'lishli-bo'lishsizlik va boshqa grammatik ma'nolarni ham ifodalaydi. O'rganuvchi fe'l shakllarini o'zlashtirish jarayonida bir vaqtning o'zida bir nechta grammatik ma'noni hisobga olishi kerak bo'ladi. Shu sababli fe'l shakllarining noto'g'ri qo'llanishi yozma nutqda uchraydigan muhim grammatik xatolardan biri sifatida namoyon bo'lishi mumkin.

Fe'l shakllaridagi xatolarni faqat qo'shimchaning noto'g'ri tanlanishi bilan izohlash yetarli emas. Ayrim hollarda o'rganuvchi grammatik shaklni bilgan holda, uni vaqt munosabatiga moslashtira olmaydi. Boshqa holatlarda esa shaxs va son munosabatining buzilishi kuzatiladi. Demak, fe'l grammatikasini o'zlashtirish jarayonida shakl, ma'no va nutqiy vaziyat o'rtasidagi munosabatni birgalikda shakllantirish zarur.

Grammatik me'yorlarning shakllanishida sintaksis ham muhim o'rin tutadi. O'zbek tilida so'zlarning gap tarkibidagi munosabati ularning shakli va sintaktik vazifasi bilan chambarchas bog'liq. N. Mahmudov va A. Nurmanovlarning *O'zbek tilining nazariy grammatikasi*. Sintaksis asarida ham sintaksis so'z shakllarining bog'lanish qoidalari va shu qoidalar amalga oshadigan gapni o'rganishi ta'kidlanadi.

Shu sababli ikkinchi til o'rganuvchisining grammatik xatosini tahlil qilishda alohida so'z shaklidan tashqari, uning gapdagi o'rnini ham hisobga olish lozim. So'z shakli o'z-o'zidan to'g'ri bo'lishi mumkin, biroq boshqa birliklar bilan noto'g'ri bog'langanida gapning grammatik tuzilishida xato yuzaga keladi. Bunday xatolar ega va kesim munosabati, aniqlovchi va aniqlanmish, to'ldiruvchi va kesim o'rtasidagi bog'lanish yoki gapdagi so'zlarning tartibi bilan bog'liq bo'lishi mumkin.

O'rganuvchining ona tili ham ikkinchi til grammatikasini o'zlashtirish jarayoniga ma'lum darajada ta'sir ko'rsatishi mumkin. Birinchi tilda mavjud grammatik hodisaning ikkinchi tilda boshqa usulda ifodalanishi o'rganuvchi uchun qiyinchilik tug'diradi. Bunday vaziyatda o'rganuvchi o'ziga tanish

bo'lgan grammatik model asosida yangi til birliklarini qo'llashga harakat qilishi mumkin. Natijada ikkinchi tilda me'yoriy hisoblanmaydigan grammatik shakl yoki sintaktik qurilma yuzaga keladi.

Biroq grammatik xatolarning barchasini faqat ona tilining ta'siri bilan izohlash mumkin emas. O'rganuvchining tilni o'zlashtirish bosqichi, grammatik qoidani noto'g'ri umumlashtirishi, o'xshash shakllarni bir-biriga almashtirishi yoki yangi o'rganilgan grammatik modelni boshqa vaziyatlarga noo'rin ko'chirish kabi holatlar ham xatolarning yuzaga kelishiga sabab bo'lishi mumkin. Shu jihatdan grammatik xato o'rganuvchining tilni qanday o'zlashtirayotganini ko'rsatuvchi muhim material sifatida qaralishi lozim.

O'zbek tilini ikkinchi til sifatida o'qitish metodikasida grammatik materialni nutq bilan bog'lash masalasi alohida ahamiyatga ega. Grammatik birliklar o'rganuvchiga faqat qoida shaklida emas, balki real nutqiy vaziyatlar orqali taqdim etilganda ularning amaliy qiymati oshadi. O'rganuvchi grammatik shaklni qayerda, nima sababdan va qanday ma'noda qo'llash mumkinligini anglaganida uning grammatik ko'nikmasi yanada mustahkamlanadi. X. Muxitdinovanning metodik qo'llanmasida ham o'zbek tilini ikkinchi til sifatida o'qitishning nutqiy yo'nalishga ega bo'lishi muhimligi qayd etiladi.

Grammatik me'yorlarni shakllantirishda mashqlar tizimi ham muhim vosita hisoblanadi. Dastlab o'rganuvchi grammatik shaklni tanish va farqlashga yo'naltirilgan mashqlarni bajaradi. Keyinchalik ushbu shaklni gap tarkibida qo'llash, undan mustaqil ravishda foydalanish va o'z fikrini ifodalashga qaratilgan topshiriqlar murakkablashib boradi. Bunday izchillik grammatik

bilimning amaliy ko'nikmaga aylanishini ta'minlashga xizmat qiladi.

Yozma nutq grammatik me'yorlarning shakllanganlik darajasini aniqlash uchun alohida ahamiyatga ega. Og'zaki muloqotda ayrim xatolar suhbatdosh tomonidan mazmun asosida tushunilishi yoki muloqot jarayonida tuzatilishi mumkin. Yozma nutqda esa grammatik shakl, so'zlar o'rtasidagi munosabat va gap tuzilishi aniq ifodalanadi. Shu sababli yozma matn o'rganuvchining grammatik bilimlarini amaliy jihatdan namoyon etuvchi muhim materialdir.

O'rganuvchilarning yozma ishlarini tahlil qilish orqali grammatik xatolarning takrorlanish xususiyatlarini aniqlash mumkin. Agar ma'lum bir grammatik shakl turli matnlarda muntazam ravishda noto'g'ri qo'llansa, bu holat ushbu grammatik hodisaning o'rganuvchilar uchun muayyan qiyinchilik tug'dirayotganidan dalolat beradi. Aksincha, ayrim grammatik shakllarning kam xato bilan qo'llanishi ularning o'zlashtirilishi nisbatan barqaror ekanini ko'rsatishi mumkin.

Shu nuqtayi nazardan, grammatik xatolarni faqat salbiy natija sifatida baholash to'g'ri emas. Xato o'rganuvchining qaysi grammatik birlikni qanday tushunganini ko'rsatadigan materialdir. O'rganuvchi tomonidan bir xil xatoning takroran sodir etilishi uning muayyan grammatik munosabatni hali to'liq o'zlashtirmaganligini ko'rsatishi mumkin. Demak, xatolarni muntazam tahlil qilish o'quv jarayonini takomillashtirish va grammatik materialni qayta tashkil etish uchun ham xizmat qiladi.

O'zbek tilining grammatik tizimini o'rgatishda grammatik shakllarning o'zaro bog'liqligiga ham e'tibor qaratish zarur.

Masalan, otning kelishik shakli ko'pincha fe'l bilan munosabatda namoyon bo'ladi, egalik shakli esa boshqa grammatik birliklar bilan bog'liq holda qo'llanadi. Fe'ning shaxs-son shakli ega bilan munosabatga kirishadi. Shuning uchun grammatik kategoriyalarni mutlaqo alohida o'rgatish o'rganuvchining til tizimini yaxlit holda egallashiga har doim ham yetarli imkoniyat yaratmaydi.

Grammatik me'yorning shakllanishi bosqichma-bosqich amalga oshadigan jarayon sifatida qaralishi kerak. Dastlabki bosqichda o'rganuvchi grammatik shakllarni tanib olish va ularning asosiy ma'nolarini farqlashni o'rganadi. Keyingi bosqichda grammatik shakllarni tayyor nutqiy namunalar asosida qo'llash ko'nikmasi rivojlanadi. Yuqoriroq bosqichlarda esa o'rganuvchi grammatik vositalardan mustaqil ravishda foydalanib, o'z fikrini turli mazmun va vaziyatlarda ifodalash imkoniyatiga ega bo'ladi.

Shunday qilib, o'zbek tilini ikkinchi til sifatida o'zlashtirishda grammatik me'yorlarning shakllanishi grammatik qoidalarini bilish, grammatik shakllarni farqlash va ularni nutq jarayonida to'g'ri qo'llashning birligi asosida yuzaga keladi. O'rganuvchining grammatik xatolari esa mazkur jarayonning turli bosqichlarini aniqlash imkonini beruvchi muhim lingvistik materialdir.

O'zbek tilini ikkinchi til sifatida o'rganuvchilarning grammatik xatolarini o'rganishda, avvalo, xatolarning qaysi grammatik kategoriyalarda ko'proq uchrashini aniqlash, keyin ularning yuzaga kelish sabablarini tahlil qilish va nihoyat, ushbu xatolarni bartaraf etishga xizmat qiluvchi metodik vositalarni belgilash maqsadga muvofiq. Bunday yondashuv grammatikani o'rgatishni faqat nazariy ma'lumot berishdan chiqarib,

o'rganuvchining real nutqiy ehtiyojlari bilan bog'lash imkonini beradi.

Xulosa qilib aytganda, o'zbek tilini ikkinchi til sifatida o'zlashtirishda grammatik me'yorlarning shakllanishi murakkab va izchil jarayon bo'lib, u grammatik bilim, amaliy ko'nikma va nutqiy faoliyatning o'zaro bog'liqligi asosida rivojlanadi. O'zbek tilining grammatik qurilishi, grammatik ma'nolarning shakl orqali ifodalanishi va so'zlarning gapdagi munosabatlari ikkinchi til o'rganuvchilari uchun o'ziga xos qiyinchiliklarni yuzaga keltirishi mumkin.

Yozma nutqda kuzatiladigan grammatik xatolar ushbu qiyinchiliklarni aniqlash uchun muhim manba bo'lib xizmat qiladi. Kelishik, egalik, ko'plik, fe'l shakllari, shaxs-son munosabatlari va sintaktik bog'lanishlar bilan bog'liq xatolarni izchil o'rganish orqali o'rganuvchilarning grammatik tizimni o'zlashtirish xususiyatlarini aniqlash mumkin. Bunda xatoni faqat tuzatilishi kerak bo'lgan kamchilik sifatida emas, balki o'rganish jarayoni haqida ma'lumot beruvchi lingvistik hodisa sifatida ko'rish muhimdir.

Shuningdek, grammatik me'yorlarni shakllantirishda grammatik materialni nutqiy vaziyat bilan bog'lash, mashqlarni bosqichma-bosqich murakkablashtirish, o'rganuvchining mustaqil fikr ifodalashiga sharoit yaratish va yozma nutqdagi xatolarni muntazam tahlil qilib borish samarali natija beradi. Mazkur yondashuv o'zbek tilini ikkinchi til sifatida o'rganuvchilarning grammatik kompetensiyasini shakllantirish bilan birga, ularning yozma nutqini izchil rivojlantirish uchun ham muhim metodik asos yaratadi

Foydalanilgan adabiyotlar

Muxitdinova X. S. O'zbek tilini ikkinchi til sifatida o'qitish metodikasi. — Toshkent: G'afur G'ulom nomidagi nashriyot-matbaa ijodiy uyi, 2023. — 312 b.

Normatova Sh., Abdurahmonova M. O'zbek tili. — Toshkent, 2014. — 193 b.

Mahmudov N., Nurmanov A. O'zbek tilining nazariy grammatikasi. Sintaksis. — Toshkent: O'qituvchi, 1995. — 232 b.

Mahmudov N. O'zbek tilining nazariy grammatikasi. Morfologiya. — Toshkent: O'qituvchi, 1995. — 149 b.

O'zbek tili grammatikasi. I tom. Morfologiya. — Toshkent: Fan, 1975.

O'zbek tili grammatikasi. II tom. Sintaksis. — Toshkent: Fan, 1976.

Hojiyev A. Tilshunoslik terminlarining izohli lug'ati. — Toshkent: O'zbekiston milliy ensiklopediyasi, 2002. — 163 b.

Asqarova M. Hozirgi o'zbek adabiy tilidan ma'ruza matnlari. Sintaksis. — Toshkent, 2000.

Ikromova R., Muhamedova D., Shodmonqulova D., G'ulomova X. Hozirgi o'zbek adabiy tilidan ma'ruza matnlari. Sintaksis. — Toshkent, 2001.

CONTENTS:

No.	Article Title	Author(s)	Pages
1	Education in the Age of Generative Artificial Intelligence: Navigating Disruption, Cultivating Resilience, and Reimagining Pedagogy	Usman Khalid	5–15
2	Artificial Intelligence and Educational Equity in Central Asia: Challenges and Opportunities for Uzbekistan's Higher Education System	Dilorom Akhmedova	16–30
3	AI Literacy and Academic Integrity in Pakistani Higher Education: Navigating the Pedagogical Frontier	Hassan Mahmood	31–43
4	Combined Unit Providing Minimum Work With Soil	Anvarjon Uktamovich Igamberdiev	31–35
5	Labor Market In The Era Of Artificial Intelligence And Automation: A Comparative Analysis Of Global Trends And The Experience Of Uzbekistan	Abbos Asrorovich Tursunkulov, Ilyos Ibragimovich Ergashev	36–42
6	Teacher Readiness for Human-Centred Generative AI Integration in Uzbekistan	Dilrabo Ibragimova	43–55
7	Pragmatic aspects of entrepreneurial discourse and a comparative corpus-based analysis of English and Uzbek	Muhlisa Shuhratova	56–68
8	Comparative Relations in English and Uzbek: Form, Meaning and Function	Intizor Bekchanova	69–73
9	Animalistic And Symbolic Aspects In The Prose Of Abish Kekilbaev	Smamutova Sh.A.	69–72
10	Seasonal Migration Of Birds In The Mountain Ranges Of State Reserve Surkhon: Ecological Features And Habitat Adaptation	Umidjon Murtazayev, Bobur Boymamatov	74–87
11	Cross-Linguistic Patterns of Euphemism Formation in Political Discourse: Evidence from a Multilingual Corpus	Nodirxon Sultanovich Sharafutdinov	88–99
12	Linguistic Foundations Of Electronic Thesaurus Construction: Structure, Synset-Formation Methodology, And Corpus-Based Evidence From The Uzbek Language	Muhammadjon Najmiddinov	100–109
13	Formation Of Grammatical Norms And Typical Errors In Learning Uzbekistan As A Second Language	Mohinur Solijonova	110–115

