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Methodology For Developing The Pedagogical Mastery Of Future Teachers Through Artificial Intelligence Tools

 Olmosbek Choriyev

PhD Student, Andijan State University, Uzbekistan

ABSTRACT

This research investigates how artificial intelligence (AI) can be used as an effective methodological tool for developing the pedagogical mastery of future teachers. The study provides a comprehensive exploration of the theoretical, methodological, and empirical aspects of AI integration in higher education, particularly in teacher education programs in Uzbekistan. Pedagogical mastery, as an essential professional quality of teachers, is understood as the synthesis of creativity, reflection, communication, and methodological competence. Within this context, AI technologies are viewed as innovative instruments that can simulate teaching situations, generate analytical feedback, and create personalized learning pathways for teacher trainees. Using a mixed-method approach, the research involved 120 students of Andijan State University who were divided into control and experimental groups. The experimental group employed AI-based platforms such as ChatGPT, Google AI Classroom, Canva Edu, and Quizlet AI in their academic and teaching practice. Data were collected through surveys, reflective journals, and lesson observations, followed by statistical analysis using SPSS.

The findings revealed that AI tools significantly improved pedagogical creativity, reflective competence, and communication skills, leading to a 25–30% increase in pedagogical performance indicators compared with traditional methods. The study concludes that AI-supported learning environments encourage independent thinking, self-assessment, and professional growth among future teachers. Furthermore, the research recommends implementing AI-based modules in teacher education curricula to modernize pedagogical training and align it with global digital transformation trends.

Keywords: Artificial intelligence, pedagogical mastery, teacher education, reflective learning, adaptive pedagogy, digital transformation, professional competence, Uzbekistan.

INTRODUCTION

In the contemporary era of digital transformation, the field of education is undergoing a paradigm shift. The emergence of artificial intelligence (AI) technologies has opened new frontiers in the modernization of teaching, learning, and assessment. For teacher education institutions, these innovations provide not only new tools but also new pedagogical opportunities to enhance the professional and creative competencies of future teachers. In this context, the development of pedagogical mastery— defined as the ability to effectively integrate theoretical knowledge, teaching methods, and personal creativity— has become one of the central challenges of modern pedagogy. The rapid growth of AI tools such as ChatGPT, Google AI Classroom, and adaptive learning systems has shown that technology can personalize learning, automate evaluation, and stimulate reflection among students and teachers. While these technologies have already transformed industries like business and medicine, their educational potential is still unfolding. AI can analyze vast amounts of data about learners, offer adaptive feedback, and assist in creating individualized educational trajectories. When applied effectively in teacher training programs, these features can play a key role in cultivating pedagogical mastery among prospective educators.

In Uzbekistan, the modernization of teacher education has become a national priority. The Presidential Decree PF-4958 (2017) and Cabinet Resolution No. 304 (2017) initiated systemic reforms in postgraduate and higher education, emphasizing innovation, scientific research, and digital competence development. Furthermore, the Digital Uzbekistan–2030 Strategy outlines the integration of artificial intelligence into education as a strategic direction for improving human capital and national competitiveness. However, despite these initiatives, traditional pedagogical approaches remain prevalent in universities. Teacher education often focuses on theoretical knowledge transfer rather than the practical development of reflective and analytical skills supported by modern technologies.

The concept of pedagogical mastery is not new in educational theory. It has been explored by renowned scholars such as V. Slastenin, Sh. Amonashvili, and Yu. Babansky, who described it as a synthesis of pedagogical skill, creativity, and moral culture. In modern times, this concept is being redefined through the lens of digital pedagogy. Pedagogical mastery now extends beyond classroom management and instructional techniques—it involves data-driven decision-making, digital literacy, emotional intelligence, and the ability to design adaptive learning experiences. Therefore, the development of pedagogical mastery through AI tools reflects a new scientific and methodological direction that combines pedagogy, psychology, and information technology. AI tools can serve as powerful assistants in teacher training. They can model virtual classrooms, simulate student responses, and provide immediate, data-informed feedback. For instance, intelligent tutoring systems can assess students' comprehension levels and adjust the difficulty of tasks accordingly. AI writing assistants can help teacher trainees analyze their lesson plans, identify weak points, and suggest improvements. Moreover, AI-driven reflection platforms can track the professional growth of student teachers by recording progress in creativity, communication, and methodological thinking. The importance of integrating AI into teacher education goes beyond technological adoption. It represents a shift toward a more reflective and personalized pedagogy, where future teachers become active designers of their learning process. Reflection, one of the key dimensions of pedagogical mastery, is greatly enhanced by AI through instant feedback loops and data visualization. Similarly, creativity and professional communication are strengthened when students interact with intelligent systems that challenge them to think critically and produce original teaching strategies. However, the integration of AI into teacher education also presents several challenges. These include the need for ethical frameworks, teacher educators' readiness, and the balance between human and machine intelligence in the learning process. There is also the risk that excessive reliance on AI might reduce opportunities for genuine human interaction—a crucial component of pedagogical culture. Therefore, the application of AI must be grounded in pedagogical ethics, ensuring that technology complements, rather than replaces, the humanistic nature of education. Given these global and national trends, this study aims to develop a methodology for fostering pedagogical mastery among future teachers through the use of AI tools.

LITERATURE REVIEW

The Global Context of Artificial Intelligence in Education

Over the past two decades, artificial intelligence (AI) has become one of the most transformative technologies influencing education worldwide. According to UNESCO's AI and Education: Guidance for Policy-Makers (2021), AI is redefining the roles of teachers, learners, and institutions by enabling adaptive learning, automated assessment, and personalized feedback systems. The integration of AI into education is seen as a strategic priority for achieving Sustainable Development Goal 4 — "Quality Education for All."

The OECD (2022) emphasizes that AI's role in education goes beyond automation; it serves as a tool for cognitive enhancement, supporting creativity, reflection, and individualized instruction. Similarly, Holmes, Bialik, and Fadel (2022) classify AI's pedagogical functions into three categories:

1. Automation — replacing repetitive administrative tasks such as grading;

2. Augmentation — assisting teachers in instructional planning;

3. Amplification — expanding teachers' creative and reflective capacities.

In the United States, the use of AI in teacher education programs focuses on adaptive tutoring and simulation-based training (Zhao, 2023). Finland has incorporated AI

into teacher preparation through virtual reality (VR) teaching laboratories, which allow student-teachers to practice classroom management in simulated environments. In South Korea and Singapore, AI is used to measure pedagogical effectiveness through data-driven observation tools and reflective analytics. These international cases demonstrate that AI technologies can cultivate pedagogical mastery by developing creativity, communication, and decision-making skills. The concept of pedagogical mastery has a long-standing tradition in educational theory. According to V. Slastenin (1998), pedagogical mastery represents the unity of professional knowledge, pedagogical skill, and moral culture. Yu. Babansky (1989) defines it as the "integrated capacity to solve pedagogical tasks effectively through creative and reflective application of knowledge." Sh. Amonashvili (2019) emphasizes the humanistic dimension of pedagogical mastery, arguing that effective teaching is based on love, empathy, and respect toward learners.

In the digital age, pedagogical mastery extends beyond classroom management or traditional didactics. It now includes digital literacy, innovation, adaptability, and the ability to leverage technology for educational improvement. Luckin (2023) argues that teachers must work in "partnership" with AI, developing a "co-intelligent pedagogy" that enhances human reasoning rather than replaces it. This aligns with the emerging concept of connectivism (Siemens, 2005), which suggests that learning in the 21st century occurs through networks — both human and technological. AI's role in teacher professional development has expanded rapidly in recent years. According to OECD (2022) and UNESCO (2023), AI helps teachers engage in reflective practice through data analysis and continuous feedback. AI-based platforms can analyze lesson quality, detect teaching gaps, and generate real-time recommendations.

Holmes et al. (2022) note that AI's analytical power can enhance teachers' reflective thinking — a core element of pedagogical mastery. AI-driven dashboards allow teachers to visualize their teaching performance, compare outcomes, and make evidence-based improvements. Moreover, Anderson (2023) highlights that AI encourages metacognitive awareness among teachers, enabling them to evaluate not only what they teach but also how they teach. Another dimension of AI in professional development is simulation-based teacher training. Platforms like TeachLivE and ClassVR provide interactive, AI-driven classroom environments where pre-

service teachers can practice dealing with diverse educational scenarios. These systems strengthen pedagogical creativity, flexibility, and problem-solving ability — essential features of pedagogical mastery. In Uzbekistan, the integration of artificial intelligence into the education sector is still in its formative stage. However, significant progress has been made in recent years under the Digital Uzbekistan–2030 Strategy and the Concept for the Development of Higher Education (2020–2030). These national strategies aim to modernize education through digital technologies and innovative teaching methods. Research by Ismoilov (2023) at Andijan State University and Raxmonova (2022) at Tashkent State Pedagogical University emphasizes the growing importance of digital pedagogy and AI literacy among teachers. However, most studies focus on general ICT skills rather than the systematic development of pedagogical mastery through AI. There remains a lack of comprehensive methodological frameworks that integrate AI with pedagogical, psychological, and ethical components of teacher education. Moreover, while Uzbek universities have adopted platforms like Moodle and Google Classroom, the use of adaptive AI systems remains limited. Teacher educators often lack access to training in AI-based tools, and there is a need for localized guidelines and curricula that reflect Uzbekistan's educational context and cultural values. Therefore, this study aims to fill these gaps by developing and empirically validating a methodological framework for enhancing pedagogical mastery through artificial intelligence tools. The proposed framework will combine traditional pedagogical theories with modern AI technologies to establish a sustainable and ethically grounded approach to teacher training.

METHODOLOGY

The primary purpose of this research is to develop and validate a methodological framework for improving the pedagogical mastery of future teachers through artificial intelligence (AI) tools. The study aims to identify how AI technologies can enhance teachers' creativity, reflective thinking, communication skills, and methodological competence in a higher education context.

The main objectives of the study are as follows:

1. To analyze the theoretical and methodological foundations of AI integration in teacher education.

2. To determine the effectiveness of AI tools in fostering

pedagogical mastery among pre-service teachers.

3. To design and test an experimental model of AI-supported pedagogical training.

4. To develop practical recommendations for implementing AI-based methodologies in teacher education curricula.

Research Approach

A mixed-method approach (quantitative and qualitative) was employed to provide a comprehensive understanding of how AI tools influence pedagogical mastery. The quantitative component focused on measuring the level of improvement in pedagogical competencies, while the qualitative component explored students' perceptions, experiences, and reflections regarding AI-assisted learning. The use of mixed methods ensured both depth and reliability of the findings. Quantitative data provided measurable indicators of growth, and qualitative data offered rich insights into behavioral and psychological changes among participants.

Research Design

The study followed an experimental research design with two groups:

• Experimental Group (EG): Students who received training with AI-integrated pedagogical activities.

• Control Group (CG): Students who continued with traditional pedagogical methods without AI tools.

Both groups underwent identical pedagogical courses; however, the experimental group utilized AI-based technologies such as ChatGPT, Google AI Classroom, Quizlet AI, and Canva Edu to enhance their learning process. The experiment lasted one academic semester (16 weeks).

The study was conducted among 120 undergraduate students majoring in pedagogy at Andijan State University during the 2024–2025 academic year.

• 60 students were assigned to the experimental group,

• 60 students to the control group.

Participants were selected using random sampling to ensure unbiased representation. Gender distribution was balanced (65% female, 35% male), reflecting the general demographics of pedagogical faculties in Uzbekistan. All participants volunteered to take part in the study and were informed about the research objectives and data confidentiality.

Research Procedure

The research process consisted of three key phases:

1. Diagnostic Phase

At the beginning of the semester, both control and experimental groups completed pre-tests to measure their baseline pedagogical skills, creativity, and reflective thinking. Observations of their teaching micro-sessions were recorded to identify existing challenges.

2. Formative Phase

During this stage, AI tools were integrated into the teaching and learning process.

• ChatGPT was used to generate lesson ideas, quizzes, and feedback.

• Google AI Classroom provided an interactive platform for collaboration and monitoring.

• Canva Edu was employed for creative lesson design and digital visualization.

• Quizlet AI facilitated self-assessment and knowledge retention.

The control group continued with traditional lectures, printed materials, and face-to-face discussions.

3. Evaluation Phase

At the end of the semester, both groups took post-tests, and their reflective journals were analyzed. A comparative evaluation was conducted to determine the degree of improvement in pedagogical mastery indicators.

Data analysis was carried out in two stages:

1. Quantitative Analysis:

o   Descriptive statistics (mean, percentage, standard

deviation) were calculated.

o A paired sample t-test determined the significance of pre- and post-test differences between control and experimental groups.

o The effect size was calculated using Cohen's d, indicating a strong impact (d = 0.85).

2. Qualitative Analysis:

o Thematic coding of students' reflective journals identified recurring patterns related to creativity, self-reflection, and motivation.

o NVivo software was used to organize qualitative data and highlight emergent themes.

The combination of both approaches ensured a comprehensive interpretation of findings. The research adhered to ethical principles of confidentiality, voluntary participation, and informed consent. Participants were informed about the purpose of the study, their right to withdraw at any stage, and the use of data exclusively for academic purposes. No personal identifiers were disclosed in the publication. Moreover, ethical guidelines from UNESCO's 2021 "Ethical AI in Education Framework" were followed to ensure responsible and transparent use of AI tools. While the study yielded promising results, it also faced certain limitations:

• The experiment was conducted within a single institution, limiting generalizability.

• Access to AI tools depended on internet connectivity and institutional resources.

• Some participants demonstrated initial resistance due to low AI literacy levels.

Despite these limitations, the research provided strong evidence of AI's pedagogical potential and established a practical methodology for developing teachers' professional competence. In summary, the methodological framework designed in this research successfully integrated AI tools into teacher training. The mixed-method approach, combining quantitative data with qualitative insights, provided a deep understanding of how AI fosters pedagogical mastery. The systematic implementation of AI-based strategies in teacher education is expected to enhance professional training quality and contribute to the modernization of the Uzbek education system.

RESULTS

The experiment conducted at Andijan State University aimed to assess the effectiveness of integrating artificial intelligence (AI) tools in developing pedagogical mastery among future teachers. A total of 120 students participated—60 in the experimental group (EG) and 60 in the control group (CG). Both groups were taught the same pedagogical modules; however, only the experimental group used AI-based technologies such as ChatGPT, Google AI Classroom, Canva Edu, and Quizlet AI in lesson planning, reflection, and assessment. After a 16-week intervention, pre-test and post-test results revealed significant improvement in pedagogical indicators among the experimental group compared with the control group. Data analysis showed that AI-supported instruction contributed not only to cognitive growth but also to the enhancement of creativity, communication, and reflective competence—key components of pedagogical mastery.

Quantitative Results

The statistical analysis was conducted using SPSS (Version 26). Descriptive statistics indicated an overall improvement of 25–30% across all pedagogical indicators for the experimental group, while the control group showed only marginal changes (3–7%). A paired-sample t-test confirmed that these differences were statistically significant at $p < 0.05$.

Indicators of Pedagogical Mastery	Control Group (CG)	Experimental Group (EG)	Improvement (%)
Lesson design competence	62%	85%	+23%
Creativity and innovation	63%	88%	+25%

Indicators of Pedagogical Mastery	Control Group (CG)	Experimental Group (EG)	Improvement (%)
Reflective thinking	58%	84%	+26%
Communication and collaboration	60%	86%	+26%
Digital integration and use of AI	51%	83%	+32%

The mean scores of pedagogical performance were 62.8 (SD = 5.3) for the control group and 84.4 (SD = 4.6) for the experimental group. The t-value (5.92) exceeded the critical threshold (2.04), confirming that the observed differences were not random but caused by the intervention of AI tools.

Cohen's d = 0.87, indicating a large effect size, which proves the substantial impact of AI integration on pedagogical skill development.

Comparative Analysis

To assess the overall development of pedagogical mastery, pre-test and post-test differences were calculated for each competency category.

Competency Category	Pre-Test Mean (EG)	Post-Test Mean (EG)	Growth (%)
Methodological competence	60.3	82.7	+22.4
Creative competence	61.1	87.2	+26.1
Reflective competence	58.4	84.0	+25.6
Communicative competence	59.2	85.6	+26.4
Digital-AI competence	50.5	82.9	+32.4

The data clearly indicate that the highest improvement occurred in digital-AI competence, which grew by 32.4%. This confirms that AI-based instruction not only developed technical skills but also promoted broader pedagogical creativity and reflection.

Graphical Representation of Results

In the CRJP version of the article, these results were represented by a simple black-and-white bar chart. The diagram illustrated that the experimental group consistently outperformed the control group across all five pedagogical indicators, confirming the effectiveness of the AI-integrated methodology. Graphical data visualizations also demonstrated that students in the experimental group showed continuous improvement throughout the semester, indicating sustained engagement with AI-supported learning tools.

Discussion of Findings

The findings of this research align with global studies (UNESCO, 2021; OECD, 2022; Holmes et al., 2022)

emphasizing AI's role in personalizing learning and supporting reflective pedagogy. The experimental results verify that AI not only enhances content understanding but also develops essential pedagogical qualities such as creativity, analytical thinking, and communicative competence. The results support the hypothesis that AI can serve as a catalyst for developing higher-order thinking skills (Bloom, 1956). Participants in AI-assisted learning demonstrated stronger critical thinking and better lesson planning abilities. Moreover, the improvement in reflective practice validates Vygotsky's theory that learning occurs most effectively when learners receive guided support—AI acting as a form of digital scaffolding. Another key finding was the increased student autonomy. Future teachers using AI became more independent in making pedagogical decisions, suggesting that AI supports the development of self-regulated learning—a vital element of pedagogical mastery.

Summary of Key Findings

1.   AI integration led to a significant improvement (25–30%) in pedagogical performance indicators.

2.   The highest growth occurred in digital and reflective competencies.

3.   AI-supported teaching increased motivation, creativity, and professional confidence.

4.   The statistical analysis confirmed strong significance ($p < 0.05$, Cohen's $d = 0.87$).

5.   Qualitative data emphasized that AI encourages self-assessment and reflective practice.

These findings provide empirical evidence supporting the hypothesis that artificial intelligence can play a transformative role in the professional preparation of future teachers in Uzbekistan. The next section (Discussion and Model) further elaborates on how these findings inform the design of the AI-assisted pedagogical methodology.

DISCUSSION

The results of the study confirm that the integration of artificial intelligence (AI) tools significantly enhances the development of pedagogical mastery among future teachers. The experimental group showed notable progress in creativity, reflective thinking, communication, and

methodological competence compared with the control group. These findings demonstrate that AI can act not merely as a technological supplement but as a cognitive and methodological instrument that transforms the teaching-learning process. AI tools provided students with immediate feedback, data visualization, and adaptive learning opportunities, which supported deeper reflection and autonomous learning. This is consistent with Vygotsky's socio-cultural theory, where learning occurs through guided interaction within the learner's zone of proximal development. In this study, AI systems acted as virtual mentors, providing individualized support and scaffolding that promoted growth in professional and creative skills. The findings align closely with global studies conducted by UNESCO (2021) and OECD (2022), both of which emphasize AI's potential to personalize learning and enhance pedagogical efficiency. Similarly, Holmes et al. (2022) reported that AI-based instruction encourages creativity and reflective practice—two key dimensions of pedagogical mastery identified in the present research. Internationally, the results correspond with the work of Luckin (2023), who proposed the concept of "co-intelligent pedagogy," in which teachers and AI systems collaborate to optimize learning outcomes. In this study, participants in the experimental group experienced similar benefits, using AI not as a replacement but as a co-participant in the learning process. However, unlike some Western contexts where digital literacy is already high, the Uzbek experience presents unique challenges, such as limited infrastructure, lack of institutional AI policies, and uneven access to digital resources. These contextual factors influenced the extent to which AI could be fully utilized, emphasizing the need for localized strategies and professional development programs tailored to the national educational environment. From a theoretical standpoint, this research contributes to the growing field of AI-enhanced pedagogy by proposing a structured methodology for developing pedagogical mastery. It extends the classical theories of Slastenin, Amonashvili, and Babansky into the digital era, where reflection, creativity, and communication are reinforced by technological mediation.

Methodologically, the study demonstrates the effectiveness of a four-stage AI-assisted model:

1.   Awareness — motivating learners and raising ethical understanding of AI;

2.   Integration — using AI tools in lesson planning

and teaching practice;

3.   Reflection — analyzing AI feedback and evaluating performance;

4.   Transformation — applying AI-based innovation in real teaching contexts.

This model ensures that the use of AI is not limited to technical training but becomes part of holistic pedagogical formation, blending traditional humanistic values with modern technological competencies. The study's outcomes align with Uzbekistan's Digital Education Strategy (2030) and the national goal of modernizing teacher preparation. The Ministry of Higher Education has identified AI literacy as one of the key competencies for future educators. By providing empirical evidence of AI's positive impact, this research supports national initiatives aimed at digitalizing the education sector.

Furthermore, the findings contribute to the Concept for the Development of Teacher Education (2021–2030), which emphasizes the integration of innovative and interactive technologies into pedagogical training. This study provides a concrete methodological foundation for implementing those policies effectively.

Based on the results and challenges, several practical recommendations are proposed:

1.   Introduce AI Literacy Courses in teacher education curricula to build technical and ethical competence.

2.   Establish AI Pedagogical Labs in universities to conduct experiments and provide practical training.

3.   Develop national guidelines for ethical and pedagogical use of AI in education.

4.   Encourage collaboration between universities and EdTech organizations to localize AI tools for Uzbek classrooms.

5.   Provide continuous professional development for teacher educators on AI integration strategies.

   In summary, the study demonstrates that artificial intelligence, when strategically implemented, becomes a catalyst for professional and pedagogical growth. AI not only improves teaching efficiency but also deepens reflective practice and fosters creative problem-solving —

all of which are integral to pedagogical mastery. The combination of traditional pedagogy with AI-based methods leads to a hybrid model of teacher education, balancing human empathy with data-driven precision. This synergy offers new opportunities for the Uzbek education system to produce teachers who are technologically competent, ethically responsible, and pedagogically innovative.

Ultimately, AI should be viewed not as a threat to human educators but as an intelligent collaborator that extends the boundaries of teaching and learning in the 21st century.

CONCLUSION

The findings of this study provide clear evidence that the integration of artificial intelligence (AI) into teacher education can significantly enhance the development of pedagogical mastery among future teachers. By combining traditional pedagogical principles with modern AI-based technologies, the research demonstrates that it is possible to create a more dynamic, reflective, and adaptive learning environment—one that aligns with the demands of 21st-century education. The implementation of AI tools such as ChatGPT, Google AI Classroom, Canva Edu, and Quizlet AI contributed to substantial improvements in students' pedagogical competencies. Participants in the experimental group showed remarkable gains in creativity, reflective thinking, digital literacy, and communication skills. The quantitative data revealed an average 25–30% improvement in pedagogical performance indicators, while qualitative results confirmed a heightened sense of motivation, self-efficacy, and professional confidence. These outcomes prove that AI can function as an effective pedagogical assistant that strengthens rather than replaces human instruction. The results align with global research findings reported by UNESCO (2021), OECD (2022), and Luckin (2023), which emphasize the transformative power of AI in education. However, this study extends previous research by contextualizing AI integration within Uzbekistan's higher education system. It demonstrates that AI-assisted pedagogy not only improves learning efficiency but also promotes humanistic and ethical teaching values—an essential feature of pedagogical mastery in the Uzbek context.

Furthermore, the research offers a validated four-stage AI-assisted methodological model that can be applied in teacher preparation programs:

1. Awareness – introducing AI concepts and ethical principles in education;

2. Integration – applying AI tools in lesson design and teaching practice;

3. Reflection – analyzing AI-generated feedback and evaluating personal progress;

4. Transformation – fostering innovation and professional self-development through AI.

This model represents a balanced fusion of human pedagogy and intelligent technology. It ensures that AI becomes a tool for cognitive expansion and reflective learning, not mere automation. The methodological framework developed in this study can serve as a practical guide for universities seeking to modernize their teacher training curricula in accordance with the Digital Uzbekistan–2030 Strategy and the National Concept for Higher Education Development. At the same time, the research identifies several challenges that must be addressed for sustainable implementation. These include limited access to AI infrastructure, insufficient digital literacy among teacher educators, and the need for clear ethical standards governing AI use in education. Overcoming these barriers requires joint efforts from policymakers, universities, and technology providers to create an ecosystem that supports responsible and equitable AI adoption. In conclusion, the integration of artificial intelligence into teacher education represents not just a technological innovation but a paradigm shift in the formation of pedagogical mastery. AI enables future teachers to think critically, reflect deeply, and teach creatively in digital learning environments. It empowers educators to become designers of learning rather than transmitters of knowledge, thus redefining the essence of teaching in the 21st century. The outcomes of this study can serve as a foundation for future research and policymaking in Uzbekistan and beyond. Continued exploration of AI-based pedagogy will open new horizons in educational innovation, contributing to the development of competent, ethical, and reflective educators capable of shaping the learning society of the future.

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