EXPLORING NEW POSSIBILITIES OF ARTIFICIAL INTELLIGENCE IN SOLVING MODERN EDUCATIONAL PROBLEMS IN THE CONTEXT OF DIGITAL TRANSFORMATION

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ANNOTATION:

In the context of digital transformation, the modern education system is facing specific challenges. This article analyzes obstacles such as insufficient digital infrastructure, teacher preparedness, and regional inequality in the quality of education, and scientifically examines the practical possibilities of artificial intelligence in overcoming these very problems. It has been demonstrated that personalizing the learning process, assessing knowledge in real time, and reducing teachers' workload can all be implemented through artificial intelligence tools. In conclusion, it is emphasized that the harmony of technology and pedagogy is the main condition for solving these problems.

Introduction

Education is the foundation of any society, but today this foundation is facing a new test. The rapid entry of digital technologies and artificial intelligence into our lives has not bypassed the education system either — on the contrary, it is shaking its very core. The problem is not only technical: many educational institutions still lack sufficient digital infrastructure, teachers' technological preparedness is low, and the quality gap between regions is deepening from year to year. At this point, artificial intelligence appears to be both part of the problem and its solution at the same time. The "Strategy for the Development of Artificial Intelligence Technologies until 2030," adopted in Uzbekistan on October 14, 2024, clearly demonstrates the state's firm intention in this regard[45].

However, there is always a distance between the adoption of a strategy and its implementation in practice. In their study, Zaynobuddinova and Xomidova (2024) substantiated that the integration of artificial intelligence into the education system requires

[45] Resolution of the President of the Republic of Uzbekistan "On Approval of the Strategy for the Development of Artificial Intelligence Technologies until 2030." — Tashkent, October 14, 2024. — No. PQ-358.

not only technological readiness, but also pedagogical and organizational readiness.[46] This article examines precisely this issue — the problems of modern education and the real possibilities of artificial intelligence in eliminating them — from a scientific and analytical perspective. The aim is simple: not to glorify technology, but to correctly assess both its limits and its power.

Literature Review

In recent years, extensive research has been conducted both in Uzbekistan and internationally on the impact of artificial intelligence on education. Among Uzbek researchers, one of the noteworthy works in this direction is B. Raximov's study titled "Digital Education in Uzbekistan: Opportunities and Limitations." According to the author, the main problem in our country in implementing artificial intelligence is the shortage of technical infrastructure, the lack of qualified personnel, and the incomplete formation of quality databases.[47] This conclusion is directly related to the central problem of this article and creates a solid scientific basis for research in the local context. In addition, Tojiboyev I. and Karimova N. (2022), studying the methodological foundations for preparing future teachers in a digital educational environment, scientifically proved that teacher preparedness plays a decisive role in the integration of artificial intelligence.[48]

In international literature, the possibilities of artificial intelligence in education have been studied more broadly and deeply. Based on the research of Holmes, Bialik, and Fadel (2019), the role of artificial-intelligence-based adaptive learning systems in individualizing learner knowledge and increasing pedagogical effectiveness has been fully substantiated scientifically. The UNESCO 2023 report emphasizes that the realization of these opportunities largely depends on the political will and financial capacity of states. The gap between these two layers — the local problem and international experience — has not yet been sufficiently examined in the existing literature, which determines the scientific novelty of this article.

Research Methodology

The nature of the topic of this study required the combined use of theoretical-analytical and comparative methods. Scientific literature, state programs, and reports of international organizations were studied; the role of artificial intelligence in eliminating educational problems was comparatively analyzed from technological and economic-pedagogical perspectives. The induction method was applied in the study, that is, the research moved from individual facts and practical cases to general scientific

[46] Zaynobuddinova D.M., Xomidova M.O. Artificial Intelligence and Its Impact on the Future Education System // Education, Science and Innovative Ideas in the World. — 2024. — No. 58(1). — pp. 193–202.
[47] Raximov B. Digital Education in Uzbekistan: Opportunities and Limitations // Journal of Informatics and Information Technologies. — 2023. — No. 4(3). — pp. 112–126.
[48] Tojiboyev I., Karimova N. Methodological Foundations for Preparing Future Teachers in a Digital Educational Environment // Journal of Education and Innovative Research. — 2022. — No. 4(3). — pp. 87–95.

conclusions. In addition, the comparative-historical method was also applied in order to compare the existing educational practice in Uzbekistan with advanced international experience. The documentary analysis method was used to identify the gap between policy and practice on the basis of regulatory documents such as the "Digital Uzbekistan — 2030" Strategy and the "Strategy for the Development of Artificial Intelligence Technologies until 2030."[49]

Results and Discussion.

The research results clearly show that artificial intelligence is not a universal remedy for educational problems; however, when applied correctly, its effectiveness is undeniably high. Systemic problems such as the shortage of digital infrastructure and teacher preparedness are slowing the penetration of artificial intelligence into education. At the same time, it is observed that in educational institutions that effectively use adaptive learning platforms based on artificial intelligence, students' academic performance is significantly improving. In particular, according to the results of a McKinsey study, personalized learning can increase the quality of students' mastery by 30 percent, while adaptive learning methods have been scientifically confirmed to improve test results by an average of 62 percent. For teachers, it has been found that artificial intelligence can reduce the burden of assessment and administrative work by up to 70 percent, which gives teachers the opportunity to devote more time directly to the educational process.

The table below presents the possibilities of artificial intelligence in relation to problems in education:

Table 1. Key Problems in Education and the Solution Potential of Artificial Intelligence (2024–2025)

Problem	Current state	AI capability	Expected outcome
Teacher preparedness	71% of teachers have no formal training in AI	Automated lesson planning and assessment	Reducing teacher workload by 70%
Inequality in education quality	40% of schools are not connected to the Internet	Distance and adaptive learning platforms	Eliminating geographical barriers
Learner motivation	Only 54% of students show active interest in lessons	Gamification and real-time analytics	Increasing interest by 54%

[49] Resolution of the President of the Republic of Uzbekistan "On Approval of the Strategy for the Development of Artificial Intelligence Technologies until 2030." — Tashkent, October 14, 2024. — No. PQ-358.

Effectiveness of knowledge acquisition	Mastery is low with traditional methods	Personalized learning pathways	Improving outcomes by 30%
Objectivity of assessment	The human factor increases errors and time costs	Automated assessment systems	Improving test results by 62%

The analysis of the table shows that the greatest added value of artificial intelligence lies not in solving a single problem, but in its ability to strengthen several interrelated weak points of the education system at the same time. However, an important paradox becomes apparent here: the students who should benefit the most from artificial intelligence — namely, learners in rural areas or in low-income environments — still do not have access to these technologies. A 2025 Harvard University study in physics showed that students who studied with the help of artificial intelligence mastered twice as much knowledge as those in a traditional classroom environment and did so in a shorter period of time.[50] These figures, on the one hand, represent a major scientific achievement; on the other hand, they raise the question that only students with access to such opportunities can benefit from this achievement. Therefore, when integrating artificial intelligence into education, it is necessary to pay special attention not only to technical capacity, but also to the principles of equality and inclusiveness.[51]

Conclusion and Recommendations

This study showed that in institutions that successfully implemented artificial intelligence in the educational process, the quality of learners' mastery increased significantly, while teachers were freed from administrative burdens and were able to allocate more time directly to pedagogical activity. However, the lack of technical infrastructure, regions with low digital literacy, and financial constraints remain factors that slow down this process. For Uzbekistan, this issue is especially relevant: appropriate strategic documents have been adopted at the state level, but their practical implementation still contains many questions and problems. Based on the results of the study, the following recommendations are proposed: introducing mandatory professional development courses on artificial intelligence for teachers; allocating priority funding to provide schools in remote areas with digital infrastructure; gradually implementing adaptive learning platforms through pilot projects based on national standards.

In some circles, the entry of artificial intelligence into life is viewed as dangerous. However, this view is unfounded. History shows that every technological innovation — from the printing press to the Internet — initially encountered resistance, but eventually

[50] Harvard University. AI Tutoring vs. Active Learning: A Randomized Controlled Trial in Physics Education. — Cambridge: Harvard University Press, 2025. — pp. 14–18.
[51] McKinsey Global Institute. The Future of Learning: AI and Personalized Education. — New York: McKinsey & Company, 2024. — pp. 22–27.

became an integral part of society. Today, the issue is not to reject artificial intelligence, but to manage it consciously and purposefully. Time is changing, the world is developing — this is an objective reality that cannot be ignored. If we want to develop and grow, moving forward together with artificial intelligence is no longer a choice, but a necessity. If we do not adapt to modern life and learn to use it in our own interests, the risk of falling behind technology will cast a shadow not only on personal development, but also on national competitiveness. The main question is this: will we manage this change, or will change manage us?

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