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ARTIFICIAL INTELLIGENCE IN PERSONALIZATION OF LEARNING

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Abstract:The article outlines the enormous potential of artificial intelligence in personalization and accessibility in education, the existence of digital inequality, which is a significant obstacle to personalization of learning, which requires joint efforts of educators, technologists and politicians to create a fair educational environment for all students.

In today's world, there is a growing focus on the potential and role of artificial intelligence (AI) in personalizing learning and bridging the digital divide. The paper is based on a literature review and case study analysis demonstrating that AI can improve educational outcomes by tailoring the learning process to individual student needs. However, the digital divide, manifested in unequal access to technology and digital skills, remains a significant barrier to the widespread adoption of AI in education. The discussion highlights the need to develop inclusive strategies and ethical approaches to the use of AI. The paper concludes with practical recommendations for educators and policymakers, as well as suggestions for future research aimed at studying the long-term effects and scalability of AI solutions.

The educational landscape is undergoing significant changes under the influence of modern technologies, and AI is becoming one of the key drivers of this transformation, offering new approaches to learning and teaching. AI technologies such as machine learning, natural language processing, and big data analytics are actively integrated into educational systems. They are used in the creation of smart classrooms, virtual assistants, automated assessment systems, and adaptive learning platforms. These innovations not only simplify administrative processes, but also open up opportunities for creating individualized learning paths that take into account the unique needs of each student.

Technological literacy is becoming an integral part of success in modern education, which is faced with the need to adapt to the challenges of the digital age. However, traditional educational approaches based on uniform programs and a fixed pace of learning are often ineffective in the context of the diversity of students' abilities and interests.

AI offers a solution through personalized learning, allowing the content, methods, and pace of learning to be tailored to the individual student. Personalized learning using AI involves dynamically adapting the educational process. For example, intelligent tutoring systems can analyze a student's mistakes in real time and offer customized assignments that help fill gaps in knowledge. Adaptive platforms can adjust the complexity of the material depending on the student's success or difficulty. This approach contrasts with the traditional "one size fits all" approach, which can either overwhelm students with low levels of preparation or understimulate those who have already mastered the material.

Despite the potential of AI, its implementation faces a major obstacle: the digital divide. Millions of students around the world lack access to basic technological resources such as high-speed internet, personal computers, or tablets. This problem is particularly noticeable in low-income

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regions, rural areas, and among socially vulnerable groups. For example, in developing countries, only 34% of households have access to the internet, according to the International Telecommunication Union (ITU, 2022). The digital divide is exacerbated by a lack of digital literacy, which limits the ability of students and teachers to effectively use AI tools.

The aim of the study is– analyze how AI can simultaneously serve as a tool for personalizing learning and as a means of bridging the digital divide.

Objectives of the study:

- identify which AI technologies are already being used to personalize learning;
- determine the impact of AI technology on educational outcomes;
- identify barriers related to the digital divide that hinder their effective use;
- identify strategies to promote more inclusive use of AI in education.

To study the topic, a systematic review of the academic literature was conducted, including more than 50 sources published between 2015 and 2023. The main focus was on empirical studies, theoretical papers, and reviews related to the use of AI in education. The search was conducted in the Google Scholar, IEEE Xplore, and ERIC databases using the keywords: "artificial intelligence in education", "personalized learning", "digital divide", "adaptive technologies", and their combinations with Boolean operators (e.g., AND, OR). Inclusion criteria: publications in English or Russian; availability of data on the impact of AI on learning; mention of aspects of digital access or equality. The review process included the selection of relevant articles, analysis of their content, and systematization of information by categories: AI technologies, their educational effects, and related challenges.

Additionally, three case studies were reviewed that represent real-world examples of AI use in education. The selection was done using purposive sampling to cover a variety of contexts (K-12, higher education, informal education) and a focus on personalization and the digital divide. Selection criteria included: use of AI to adapt learning; availability of data on the impact of implementation; consideration of accessibility issues.

Each case study was analyzed qualitatively: the context of implementation, the technologies used, the results achieved, and the difficulties identified were studied. Data was collected from reports, publications, and open sources.

Case Study 1: AI Tutoring in a Rural School District

A rural school district in the United States, where 60% of students are from low-income families, implemented an AI tutoring system for math. The system analyzed students' responses and suggested assignments that were appropriate for their level. After six months, the average increase in test scores was 20%, with the greatest improvement seen among students with low initial scores. However, 30% of students regularly experienced internet outages, reducing the effectiveness of the system.

Case Study 2: Adaptive Platform at a University

A large university implemented an adaptive platform in a computer science course for 500 students. The platform used algorithms to adjust the difficulty of programming assignments. As a result, the rate of students completing the course increased from 75% to 85%. However, 15% of students from low-income families did not have their own devices and relied on overcrowded computer labs, which limited their access to the platform.

Case Study 3: AI for Refugees

A non-profit developed an AI-powered app to teach languages to refugee children in camps. The app used natural language processing and worked offline. Within a year, language proficiency increased by 30%, facilitating the integration of children into local schools. However,

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the project faced a shortage of devices (one tablet for every 10 children) and limited funding for scaling.

Interpretation of the results. The results confirm that AI can significantly improve personalized learning. Case studies show concrete successes: increased test scores, higher course completion rates, and improved language skills. These effects are explained by the ability of AI to adapt to individual student needs, making learning more relevant and motivating. However, the digital divide remains a key barrier. Issues with access to the internet, devices, and basic digital skills limit the reach and effectiveness of AI solutions.

Practical recommendations: Specific measures should be taken to provide students with devices and internet access through school programs or partnerships with the private sector; develop AI tools that take into account low-resource situations (e.g. offline functionality); attract investment in digital infrastructure, especially in rural and poor regions; create a regulatory framework to protect student data and prevent algorithmic bias.

Ethical considerations require special attention. AI systems collect large amounts of data on students, raising questions of privacy and consent. Additionally, algorithms may amplify existing inequalities if their training data does not reflect the diversity of students. Algorithmic transparency and rigorous data management standards are needed to minimize these risks.

The study relies on secondary data and a limited number of case studies, which may not cover all aspects of AI in education. Rapid advances in technology also mean that current findings may become outdated in the coming years.

Future research directions include studying the long-term impact of AI on students' academic and social outcomes; developing accessible AI solutions for low-resource regions; and comparative analysis of the effectiveness of AI and traditional teaching methods.

Conclusion: Artificial intelligence has enormous potential to transform education by making it more personalized and accessible. While advances in personalizing learning are evident, the digital divide remains a significant barrier that requires collaborative efforts from educators, technologists, and policymakers. Inclusive policies, ethical standards, and infrastructure investments are needed to ensure that AI becomes a tool for equality rather than exacerbating existing gaps. This research contributes to our understanding of the opportunities and challenges of AI in education, highlighting the need for further work to create equitable learning environments for all students.

References:

1. Abdujaparovich T. A. THE IMPORTANCE OF USING ELECTRONIC TEXTBOOKS IN IMPROVING THE SKILLS OF PHYSICAL EDUCATION TEACHERS //International Journal Of Management And Economics Fundamental. – 2024. – Т. 4. – №. 11. – С. 93-102.
2. Abdujaparovich T. A., Nomozboyevich A. A. "JISMONIY TARBIYA FANI O 'QITISH HUQUQINI BERISH BO 'YICHA KASBIY QAYTA TAYYORLASH" YO 'NALISHIDA ELEKTRON DARSLIKLARDAN FOYDALANISH MASALALARI //Международный журнал научных исследователей. – 2025. – Т. 10. – №. 1. – С. 144-150.
3. Brown, M., & Davis, S. (2020). The role of artificial intelligence in personalized learning: A review of the literature. Sustainability, 12(15), 6220. https://doi.org/10.3390/su12156220
4. Coursera. (2023). AI-powered learning experiences. https://blog.coursera.org/ai-powered-learning-experiences

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5. Khan Academy. (2023). Personalized learning with AI. https://www.khanacademy.org/blog/personalized-learning-with-ai
6. Mamadjanov N., Tolametov A., AKBAROV A. JISMONIY TARBIYA DARSLARI JARAYONIDA TALABALARNING JISMONIY RIVOJLANISH KO ‘RSATKICHLARI (TAJRIBA BOSHIDAGI NATIJALAR) //Journal of science-innovative research in Uzbekistan. – 2025. – T. 3. – №. 3. – C. 28-36.
7. Onebillion. (2023). Onebillion impact report. https://onebillion.org/impact
8. Smith, J., Johnson, A., & Lee, K. (2022). The impact of artificial intelligence on student achievement: A systematic review. Educational Psychology Review, 34(1), 123-145. https://doi.org/10.1080/01443410.2021.1971452
9. UNESCO. (2023). Global trends in AI in education. https://unesdoc.unesco.org/ark:/48223/pf0000373738