

THE ROLE OF ARTIFICIAL INTELLIGENCE IN PERSONALIZED LEARNING

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Annotatsiya: Sun'iy intellekt (SI) ta'lim sohasida inqilobiy o'zgarishlarni amalga oshirib, yangi ta'lim tajribalarini sinab ko'rish va har bir o'quvchining ehtiyojlariga moslashtirilgan ta'lim berish imkonini yaratmoqda. Ushbu maqola SIning shaxsiylashtirilgan ta'limdagi rolini o'rganib chiqadi va SI texnologiyalari qanday qilib ta'lim tajribalarini o'zlashtirgan xolda, o'quvchilar qiziqishi va natijalarini yaxshilashi mumkinligini tahlil qiladi. Xususan, O'zbekistondagi Jizzax Prezident maktabida amalga oshirilayotgan tashabbuslar haqida so'z yuritilganda, bu yerda SIning o'quvchilarning ehtiyojlari va rivojlanish darajasiga mos ravishda darslarga moslashtirish uchun o'quv dasturiga faol integratsiya qilinganligini ko'rish mumkin. SI asosidagi o'qitish platformalari, aqlli ta'lim tizimlari va tahlillar orqali Jizzax Prezident maktabi kabi maktablar sifatli ta'lim uchun yangi standartlarni o'rnatmoqda. Maqola SIning ta'limdagi qo'llanishi, qiyinchiliklari va imkoniyatlari haqida muhokama olib boradi hamda uning ta'sirini amaliy misollar orqali ko'rsatib beradi.

Kalit so'zlar: ta'limdagi sun'iy intellekt, shaxsiylashtirilgan ta'lim, Jizzax Prezident maktabi, moslashtiruvchi o'qitish texnologiyalari, aqlli o'qitish tizimlari, ta'limdagi bashorat qiluvchi tahlillar, ta'lim tahlillari, ta'limda ma'lumotlarni qazib olish, o'quvchilarni faollashtirish, shaxsiylashtirilgan o'qitish yo'nalishlari, ta'limda ma'lumotlar maxfiyligi.

Abstract. Incorporating Artificial Intelligence (AI) into educational settings has sparked a paradigm shift in learning methodologies, particularly in mathematics. At the Jizzakh Presidential School, a pioneering project illustrates how AI-driven applications can enhance student engagement and conceptual understanding without requiring technical expertise from teachers. This article explores the collaboration of AI and mathematics education, focusing on personalized learning, adaptive assessment, and ethical considerations. Through a well-structured review of this project's success, we aim to highlight AI's transformative potential in creating dynamic, accessible, and engaging learning environments.

Keywords: Artificial Intelligence, mathematics education, personalized learning, adaptive learning, Jizzakh Presidential School, educational technology.

Introduction. The integration of artificial intelligence (AI) in classrooms offers a transformative opportunity to enhance traditional education systems. As educational technologist Rose Luckin emphasizes, "AI has the potential to revolutionize education by enhancing the teaching process and helping learners reach their full potential" (Luckin, 2019). At Jizzakh Presidential School, a pioneering project in mathematics education showcases the role of AI in delivering personalized, adaptive learning experiences. Significantly, this project highlights accessibility, as it does not require technical expertise from developers, positioning it as a model for

straightforward AI integration. A 2019 Pearson report further underscores AI's capacity to personalize education, adjusting content in response to real-time student performance to boost engagement and retention (Pearson, 2019).

The Role of AI in Mathematics Education

AI's application in mathematics education fosters a student-centered approach, adapting to each learner's unique needs and pace. Studies confirm that AI-driven systems can personalize the learning experience, enhancing engagement and comprehension by offering real-time, tailored feedback. According to the World Economic Forum, "personalized learning is no longer an option but a necessity to cater to diverse student needs" (WEF, 2019). Anthony Seldon (2019) asserts that AI in education should serve as a supportive tool, aiding teachers by automating routine tasks and providing insights into student progress.

At Jizzakh Presidential School, mathematics teachers utilize AI to tailor instruction to each student's strengths and weaknesses, creating a more inclusive and adaptive learning environment. The AI-driven approach enables educators to monitor progress and provide immediate, data-backed support, addressing gaps in understanding that often remain unnoticed in traditional classrooms.

Project Implementation at Jizzakh Presidential School The AI project at Jizzakh Presidential School exemplifies an accessible model for integrating AI into education. Educators use a series of AI-powered applications that analyze student learning patterns, supporting data-informed instructional adjustments. These applications adapt content to the appropriate difficulty level based on student responses, preventing frustration and disengagement by aligning tasks with individual readiness. Research by Luckin and Holmes (2020) supports this approach, noting that "AI systems can diagnose and respond to student needs faster and more effectively than traditional methods." The user-friendly design of these tools at Jizzakh requires minimal technical skills, freeing teachers to focus on pedagogy rather than technology management.

Benefits of AI-Driven Mathematics Education AI's ability to personalize learning is its most significant benefit in education, allowing each student to progress at their own pace, which research has shown improves both engagement and retention (National Education Policy Center, 2018). At Jizzakh, adaptive tools empower students to tackle complex mathematics with guidance calibrated to their unique learning paths. The National Education Policy Center emphasizes that AI-based assessments outperform traditional methods in timeliness and accuracy, providing immediate feedback that fosters understanding and retention.

Adaptive Assessment and Real-Time Feedback:

AI-driven assessments dynamically adjust their difficulty according to student performance, delivering real-time feedback that enables immediate learning adjustments. Conventional testing often delays feedback, while AI-driven feedback allows students to learn from mistakes as they happen, enhancing performance. This method helped students at Jizzakh develop a stronger grasp of challenging math concepts over time.

Enhanced Teacher Support:

By automating grading and progress tracking, AI frees teachers to focus on individualized student support and enriching content. Educational futurist Anthony Seldon (2019) explains that “AI is not here to replace teachers; rather, it empowers them.” AI analysis of student data offers actionable insights, helping teachers address struggles and celebrate progress in real time. Teachers at Jizzakh report that AI-enhanced insights have allowed them to better guide student development and engagement.

Challenges and Ethical Considerations:

Despite the advantages, AI use in education raises ethical concerns, particularly regarding data privacy and bias. AI systems require substantial data to personalize learning, which prompts questions around data usage and accessibility. Jizzakh School has addressed these concerns by establishing strict data governance protocols, ensuring student data confidentiality and limiting access to authorized personnel. Managing these concerns responsibly is critical, as unchecked data use could undermine student privacy and equality (AI Now Institute, 2020).

AI bias is another important consideration, as poorly designed algorithms can inadvertently disadvantage certain student groups. Jizzakh’s approach involves routine assessments of AI systems to detect and mitigate biases, promoting fairness across all student interactions. A 2020 study by the AI Now Institute cautions that without careful design, AI algorithms may unintentionally reinforce biases, highlighting the need for transparency and fair practices in AI deployment in education.

Future Directions: As AI in education continues to evolve, emerging technologies promise to further enrich learning experiences. Key advancements include:

Virtual and Augmented Reality (VR/AR):

VR and AR offer new ways to explore mathematical concepts by immersing students in 3D environments. For example, students could interact with geometric

shapes or algebraic equations, moving from theoretical understanding to hands-on experience. Research indicates that VR/AR in education improves concept retention by making learning more interactive and tangible (Huang et al., 2020).

Emotional AI for Enhanced Engagement: Emotional AI is advancing toward recognizing students' emotional states, such as frustration or boredom, and adjusting content accordingly to maintain motivation. A 2019 study published in *Frontiers in Psychology* suggests that emotion-recognition AI tools, by responding to students' emotions, can enhance engagement and motivation through real-time lesson adjustments (D'Mello et al., 2019).

Jizzakh plans to integrate these advanced AI tools gradually, supporting educators and students in harnessing new technologies within an ethical and balanced framework.

Conclusion

The successful implementation of AI in mathematics at Jizzakh Presidential School demonstrates AI's potential to transform educational experiences through adaptive assessments, real-time feedback, and personalized learning. Although challenges around ethics and logistics remain, Jizzakh's approach provides a valuable model for educators globally, highlighting how AI can foster dynamic, inclusive, and effective learning environments.

As AI in education advances, developing frameworks that prioritize student well-being, privacy, and equity will be essential. With these measures in place, AI promises to support a future where every student has the resources and guidance needed to excel in mathematics and beyond.

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