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## AI-DRIVEN PEDAGOGICAL APPROACHES IN CONTEMPORARY EDUCATION

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### Abstract

This article examines AI-based pedagogical approaches in modern education and their impact on teaching and learning. It analyzes how AI technologies, such as adaptive learning systems, intelligent tutoring, and data-driven assessment, can enrich personalized learning and improve student outcomes. The study highlights the role of AI in supporting teachers, increasing student engagement, and promoting inclusive education. Ethical issues and the importance of responsible AI integration in educational environments are also addressed.

**Keywords:** Artificial intelligence, education, pedagogy, technology, adaptation, personalization.

### Introduction

Let us first consider, what artificial intelligence itself is. Artificial intelligence (AI) is a field of computer science that focuses on creating systems capable of performing tasks typically requiring human intelligence. These tasks include learning, reasoning, problem solving, language understanding, and decision making. From an educational perspective, AI is not limited to automation; rather, it serves as a supporting tool that enhances teaching and learning processes through data-driven and adaptive solutions. According to Holmes, Bialik, and Fadel "AI has the potential to fundamentally reshape education by supporting teachers and enhancing learning processes rather than replacing human instruction". [4; 228] This definition highlights the supportive and complementary role of AI in educational environments.



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### **Artificial Intelligence in Education**

It is universally accepted that, in recent years, Artificial intelligence has become an integral part of educational systems aimed at enhancing teaching effectiveness and improving learning outcomes. AI technologies are increasingly being used to design, assess, and support student engagement at various levels of education. Scholars argue that AI should not be viewed as a replacement for teachers, but rather as a pedagogical assistant that complements and extends human expertise. In this regard, Lakkin et al. argue that, “AI can empower teachers and students by offering adaptive feedback, personalized learning paths, and timely instructional support”. [2] This approach allows teachers to focus more on the creative, social, and critical aspects of teaching, while AI manages data-driven tasks and repetitive actions. As a result, the successful integration of artificial intelligence in education requires a balance between technological tools and pedagogical goals to ensure a meaningful and effective learning process. Because of this, I believe that, teachers should work with artificial intelligence and create new teaching methods or find new information on how to better and effectively teach students at schools or universities. I strongly believe that, in some countries start this methods to teaching students effectively and more better.

### **Adaptive learning and personalization**

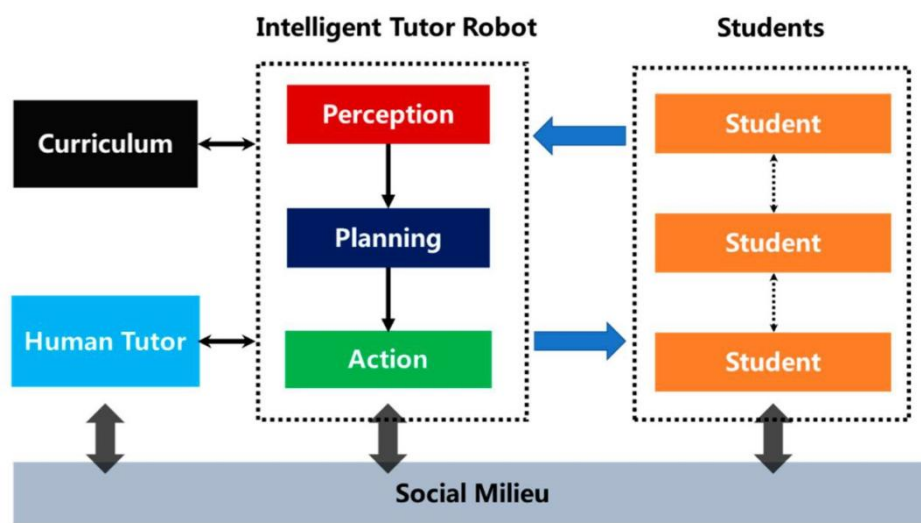
One of the most important contributions of AI to education is adaptive learning. Adaptive learning systems use AI to continuously monitor students’ progress, identify their strengths and weaknesses, and adjust lessons, exercises, and even learning paths based on this information. This ensures that each student receives personalized learning tailored to their individual needs and pace, rather than following a standard, one-size-fits-all approach. For instance, in Uzbekistan, a UNICEF – supported pilot using the AI – powered Eduten platform helped 5<sup>th</sup> grade students improve their mathematics skills significantly, demonstrating, how adaptive learning can be applied in local classrooms. In addition, these systems provide teachers with valuable information about each student’s learning process, facilitating intervention and targeted support when needed. [5] Overall, adaptive learning creates a flexible, student-centered learning experience that helps each



student better understand the material, retain knowledge more effectively, and reach their full potential.

### **Intelligent tutoring systems**

Intelligent tutoring systems (ITS) are computer programs that act as personal tutors for each student. They provide instant feedback, advice, and recommendations as students solve problems. ITS can adapt to each student's level and help them understand complex topics step by step. According to VanLena, "ITS can help students learn as effectively as a human tutor, especially in subjects such as mathematics and science" [3; 197–221]. For example, some schools in Uzbekistan are using AI-based tutoring systems in mathematics lessons. Students can solve problems independently and receive immediate assistance when they make mistakes. Teachers say this allows them to support students who need extra help without slowing down the entire class. ITS make learning more personalized, interactive, and effective for each student. By the way, there are programs, where we can search for new words in English or in another languages or translate these words. If we do not have any words on this program, we can use AI and through this we can find information about this in the word and its meaning.



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**Learning analytics and data – driven instruction.** Learning analytics is a method of using artificial intelligence to collect and analyze data about student learning. It helps teachers understand how students are performing, what areas they are struggling in, and which topics require more attention. According to OECD, AI - powered learning analytics can predict which students are likely to struggle, track their progress over time, and provide targeted support. [1] This makes teaching evidence - based and allows teachers to tailor lessons to students' needs rather than following a set plan. For example, some schools in Uzbekistan use learning analytics tools to track student learning outcomes in math and science. Teachers can quickly identify which students need additional support, identify patterns in errors, and provide personalized recommendations. This approach not only helps students improve their knowledge, but also allows teachers to manage large classes more effectively, making teaching more organized and focused. I opine that, analytic way is effective way to teaching students, because teachers cannot only control the learning of students, but they can see their students results of this teaching methods in the next years, such as how they understand some topics during the lessons, these all knowledge they can see during the lessons, when students will work actively in lessons and will show on their own results.



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**Ethical considerations.** Artificial intelligence can improve student learning, but it also poses challenges that require careful consideration. Privacy is a major concern: AI collects data about students, such as their grades, answers, and reading habits. If this information is not protected, it can be misused. Another problem is understanding how AI works. Sometimes AI gives answers or suggestions without explaining how it got there. This can be perceived as unfair or confusing.

If AI gives some students an advantage over others, this can also be perceived as unfair. To prevent this from happening, schools need to set clear rules for the use of AI. Teachers need to explain how it works, ensure the security of student data, and ensure that the system treats everyone fairly. For example, in some countries perhaps there are several lessons base on this topic, where teachers explain, how to use AI and how to use it correctly and safety.

### **Recommendations.**

No	Recommendation	Explanation
1.	Ensure data privacy	Always we should protect students' personal information and explain how it is used.
2.	Using AI as a support tool	Many people believe that, AI should help to teachers, not replace them. Combine AI with human guidance.
3.	Personalize learning	Teachers should use to adjust lessons to students' individual needs and pace.
4.	Train teachers	Provide training for teachers on how to use AI tools effectively and responsibly.
5.	Encourage student feedback	Ask students, how they feel about AI tools and improve the system based on their opinions.

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