

## THE ROLE OF ARTIFICIAL INTELLIGENCE IN DIFFERENTIATED AND PERSONALIZED EDUCATION

Elmuradova Surayyo Abdijalilovna

Assistant Teacher, Samarkand State Institute of Foreign Languages

elmurodovasurayyo6@gmail.com

### ABSTRACT

The article reveals the essence of differentiated and personalized learning approaches and analyzes the possibilities of their effective implementation using modern artificial intelligence technologies. The study examines the ways of organizing education adapted to the individual needs and knowledge levels of students with the help of artificial intelligence, using examples of real platforms.

**Keywords:** Artificial intelligence, differentiated learning, personalized learning, adaptive learning platforms, pedagogical technologies, digital education, AI, individual approach.

### INTRODUCTION

The modern education system demands flexible, personalized approaches that serve the full realization of human potential. In this context, the concepts of differentiated learning and personalized learning stand out as fundamental methodological pillars. In recent years, artificial intelligence (AI) technologies have been widely introduced into the education system and serve as a powerful tool for the effective implementation of these approaches. This article provides an in-depth analysis of the role, opportunities, and existing challenges of artificial intelligence in differentiated and personalized education.

Differentiated learning is the process of adapting teaching, taking into account students' knowledge levels, preparedness, abilities, and learning styles. Personalized learning, on the other hand, focuses on teaching that considers the student's personal interests, socio-emotional needs, and developmental level [1]. These approaches are based on the following principles:

- Individual approach
- Adapted learning content
- Active and independent learning
- Positive learning environment

The study employed qualitative analysis methods. Global and local sources, best practices, and scientific articles on the use of artificial intelligence in education were analyzed. Additionally, the operation of AI technologies and how they provide an individual approach to students were observed based on real educational platforms (Coursera, Khan Academy, Duolingo, ChatGPT).

The analysis showed that artificial intelligence supports differentiated and personalized learning in the following ways:

1. **Individualization of learning content:** Artificial intelligence technologies automatically assess students' knowledge levels and offer relevant tasks based on their difficulty level (e.g., Khan Academy and IXL Learning). This serves the application of a differentiated approach.

2. **Adaptation of the learning process:** Chatbots and adaptive platforms (e.g., Duolingo) analyze the user's learning pace and personalize teaching methods. This creates opportunities for personalized learning.

3. **Continuous monitoring of students:** With the help of AI, students' behavior, motivation level, and comprehension ability are analyzed in real-time, allowing for an individual approach.

4. **As an auxiliary tool for teachers:** Artificial intelligence eases the burden on teachers by enabling automatic assessment, lesson planning, and feedback provision [2].

At the same time, there are several challenges associated with the introduction of AI technologies in differentiated and personalized learning:

- **Data privacy and security:** Issues of privacy and security related to the collection and analysis of students' personal data require serious attention.
- **Technological infrastructure and inequality:** The lack of modern technological infrastructure in all educational institutions and the inequality in students' access to technologies can hinder the widespread adoption of AI.
- **Preparedness of pedagogical staff:** It is crucial for teachers to have sufficient knowledge and skills to effectively use AI technologies.
- **Decrease in human interaction:** Excessive reliance on AI can lead to a decrease in direct human interaction between teachers and students, which can negatively affect socio-emotional development [3].

Therefore, pedagogical and ethical principles, as well as methodological approaches, should be thoroughly developed when using artificial intelligence.

## CONCLUSION

Artificial intelligence creates significant opportunities for implementing the principles of differentiated and personalized learning in practice. These technologies are an important tool for improving the quality and effectiveness of education and ensuring an individual approach to each student. At the same time, the development of thorough concepts through the collaboration of teachers, programmers, and policymakers is necessary for its correct and purposeful application [4]. In the future, artificial intelligence, integrated with human and social approaches, will play a key role in the profound modernization of the education system.

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