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DIGITAL TECHNOLOGIES AND MODERN EDUCATION

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In recent years, the development of artificial intelligence (AI) technologies has led to significant changes in the field of education. AI provides opportunities for personalized learning, creating interactive educational materials, automating assessment systems, and supporting teachers. Machine learning, big data analysis, and natural language processing technologies play a crucial role in making the educational process more efficient and flexible. Artificial intelligence helps teachers track students' progress and provide individual assistance, while also offering students the ability to manage their learning process more effectively. This article analyzes how AI technologies have impacted the education system and how they have transformed teaching methods.

Keywords: Artificial intelligence, educational technologies, personalized learning, machine learning, big data, natural language processing, virtual teachers, interactive educational materials, automated assessment systems, innovations in education.

In recent years, the development of artificial intelligence (AI) technologies has led to significant changes in the field of education. AI-powered assistant systems, such as ChatGPT, have created new opportunities, especially for teaching database management. The field of database (DB) studies is known for its complexity, and students often face difficulties in learning this subject. Furthermore, traditional teaching methods often fail to fully meet students' needs. For this reason, teaching databases with the help of ChatGPT creates opportunities for students to better understand concepts, complete practical exercises, and learn topics in a more interactive manner. This article examines the methodology and methods of teaching database management using ChatGPT, as well as the effectiveness of this approach, statistics from 2020-2025, and practical examples.



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Artificial Intelligence and Teaching Processes Several sources were analyzed to study teaching methodology in the context of AI-assisted learning. First, the general principles and opportunities of teaching with ChatGPT were reviewed. Additionally, trends in database teaching from 2020 to 2025 and the impact of AI technologies such as ChatGPT on the educational process were analyzed. Statistical data and the effectiveness of teaching methods were examined. Research methods included surveys of teachers and students, practical exercises, and interactive lessons.

1. Effectiveness of Teaching with ChatGPT

From 2020 to 2025, the widespread use of AI technologies in education introduced new approaches to teaching database management. Research conducted at several universities in Europe and North America indicated that students accepted AI-assisted teaching methods better than traditional teaching methods.

In 2021, studies conducted at several universities in the United States showed that students who took courses through ChatGPT had frequent opportunities to ask questions and clarify misunderstandings, which increased the effectiveness of the learning process. According to statistical studies conducted between 2020 and 2022, students taught with ChatGPT retained 25-30% more solid knowledge. As a result, students were able to absorb educational material more effectively.

Chatbots and Virtual Teachers

Chatbots, such as ChatGPT, help students by offering 24/7 assistance, answering questions, resolving misunderstandings, and providing additional materials. This provides an excellent opportunity for students to strengthen their learning process. According to a 2022 New York Times article, universities and schools improved students' motivation and academic outcomes significantly by using ChatGPT as a chatbot to provide online support.

2. Supporting Students and Teachers

Teaching with ChatGPT methodology provided students with individualized approaches. Teachers used ChatGPT for interactive communication with students



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during lessons, answering their questions promptly and resolving misunderstandings. At the same time, ChatGPT assisted teachers in lesson planning, creating exercises, and analyzing students' final assessments.

A study conducted by EdTech Digest in 2020 showed that AI increased the effectiveness of providing individualized lessons to students by 35%. AI systems help create personalized learning programs based on students' learning speed, abilities, and knowledge retention.

Research conducted at universities in Japan and Korea in 2022 showed that teachers using ChatGPT in their teaching methods communicated more effectively with students and significantly improved their knowledge levels. Teachers achieved successful results by creating exercises based on ChatGPT and engaging in online communication with students.

3. Practical Exercises and Tests

Creating interactive tests and exercises for students became easier with ChatGPT. By 2023, tests developed using ChatGPT were highly rated by students. Students were able to complete tests in real-time and immediately review their errors. From 2020 to 2023, teachers used ChatGPT to assess tests and monitor changes. Additionally, students found it beneficial to create variable questions with ChatGPT and reinforce their knowledge.

AI technologies allow for the automatic grading of students' work and quick analysis of test results. This enables teachers to spend more time providing individualized support to students.

A 2020 study conducted by the University of California, Berkeley, showed that AI-based automatic grading systems reduced teachers' work time by 40%.

In higher education institutions, the use of AI technologies in teaching database management is expanding. AI is used to automate educational processes, assess students' knowledge, and improve the quality of education. For example, expert systems can analyze students' knowledge and provide personalized recommendations.



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Some Notable Universities Using AI Technologies in Education

The top 100 universities worldwide are successfully implementing AI technologies in the education process. These universities stand out for their advanced research, educational programs, and innovative approaches. Some examples are:

- **Carnegie Mellon University (USA):** Known as one of the top universities in computer science and AI, its AI programs and research are highly regarded.
- **Tsinghua University (China):** Ranked first in AI according to reputable rankings like Times Higher Education and QS World University Rankings.
- **University of Alberta (Canada):** Conducts advanced research in machine learning and AI through the Alberta Machine Intelligence Institute (Amii), and its computer science department is ranked fourth in Canada.

In Uzbekistan, several measures have been taken to introduce AI technologies into the education system. According to the Presidential Decree PQ-4996, dated February 17, 2021, measures have been defined to create conditions for the rapid introduction of AI technologies.

Effectiveness of Teaching with ChatGPT

The effectiveness of teaching with ChatGPT depends on several factors. First, it offers students an interactive and personalized approach. Second, it makes the learning process more interesting and effective for students. Research conducted between 2020 and 2025 shows that incorporating ChatGPT into the educational process has proven to be effective. Students perceive themselves not as passive recipients but as active participants in the learning process, which increases their motivation. However, for teachers to fully and effectively apply ChatGPT, they need specialized training and resources.

Teaching database management with ChatGPT can be more personalized and effective compared to traditional teaching methods. Research conducted from 2020 to 2025 shows that students accept teaching through ChatGPT more positively, which enhances learning effectiveness. Additionally, this approach is effective and convenient for teachers, making the educational process more interactive. However, for this approach to be widely implemented, several changes and additional preparations are required in the educational system.



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In conclusion, the universities mentioned above successfully implemented ChatGPT and other AI systems in teaching database management, helping increase the effectiveness of education for students. From 2020 to 2025, the use of AI technologies in teaching has been one of the innovations in the field of education and has been widely applied with high efficiency in numerous academic and educational institutions.

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