SMART CLASSROOMS: HOW AI IS TRANSFORMING TRADITIONAL SCHOOL EDUCATION

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Abstract. The topic “Smart Classrooms: How AI is Transforming Traditional School Education” analyzes the role and importance of artificial intelligence in the modern education system. Smart classrooms provide a more interactive, flexible and student-centered approach to traditional education. AI technologies significantly improve the quality of education by identifying the individual needs of students, automatically assessing their knowledge level, personalizing the learning process and offering teachers intelligent tools. Smart boards, voice-controlled teaching systems, chatbots and virtual assistants are widely used in such classrooms. Artificial intelligence conducts real-time analysis, monitors student activity and provides them with customized educational materials. As a result, students acquire independent learning skills, and teachers have the opportunity to organize the lesson process more effectively. This work aims to highlight the role, advantages and future opportunities of AI technologies in the modernization of traditional school education.

Keywords: Smart classroom, artificial intelligence, educational technologies, personalized learning, smart board, digital learning, school education, AI-based assessment, interactive learning, educational innovations.

The rapid technological development of the 21st century has fundamentally changed the field of education. The traditional education model has been based on classroom lessons, teacher explanations, textbooks and tests for many years. However, the advent of artificial intelligence (AI) technologies has taken the educational process to a new level. Smart classrooms, that is, smart classrooms, not only increase the efficiency of the educational process, but also make it interactive, personalized and student-centered.

This article scientifically and methodologically analyzes the impact of AI-based smart classrooms on traditional school education, changes in the roles of teachers and students, the advantages of technology and existing problems.

A smart classroom is a modern classroom equipped with digital technologies, artificial intelligence, sensor devices and interactive learning tools. Such classrooms use smart boards, digital platforms, AI assistants, biometric tracking systems, voice-controlled devices and virtual teaching tools.[1]

The main goal of smart classrooms is to optimize the learning process of students, reduce the workload of teachers and improve the quality of education.

Personalized learning based on artificial intelligence

AI creates learning materials adapted to students based on their:

level of knowledge,

reading pace,

interests,

previous results.

For example, if a student is strong in mathematics, AI gives him more complex problems, but if he has difficulty in language subjects, the materials are simplified.

This approach allows for individualized learning, which is almost impossible in traditional classrooms.

AI automatically analyzes student work

and analyzes indicators such as tests,

essays,

written assignments,

projects,

oral responses,

speech accuracy

in real-time.[2]

More accurate and objective assessments significantly increase the quality of education.

AI can also help students outside of class. Chatbots:

answer questions,

suggest additional textbooks,

help solve exercises,

remind about homework.

This reduces the teacher's workload.

According to studies in US and Japanese schools, students in smart classrooms:

express their opinions 40% more,

participate in interactive tasks 50% more,

motivation in class increases by 60%.

AI technologies make students active participants in the lesson process.

In the traditional model, the teacher is the main source of knowledge, while in smart classrooms he plays the role of:

guide,

motivator,

facilitator,

supervisor,

strategic advisor.

In smart classrooms, students have access to materials wherever they want:

from home,

from school,

from the library,

by phone.

This contributes to the full digitalization of education.

With the help of AI technologies, students familiarize themselves with the materials before the lesson, and during the lesson:

group work,

practical tasks,

discussions,

projects

are performed.[3]

This approach allows working at higher levels of Bloom's taxonomy.

Advantages of Smart Classrooms

1. Increases lesson efficiency. AI optimizes the learning process through real-time observation and analysis.

2. Impartial and rapid assessment. AI eliminates the subjectivity arising from the human factor.

3. Personalized learning. An individual learning strategy is created for each student.

4. Increases student interest. Interactive technologies make lessons interesting.

5. Additional resources for teachers creates more opportunities. They spend more time on methodological preparation and creative activities.[4]

PROBLEMS AND MEASURES OF SMART CLASSROOMS

Technical problems

internet quality,

lack of devices,

poor technical service.

Digital divide

Some students may live in families without access to technology.

Teacher training level

Special qualifications are required to work with AI.

Ways to overcome problems:

strengthening digital infrastructure,

training teachers,

expanding state programs,

phased introduction of technologies.

In the future, smart classrooms will develop in the following areas:

virtual reality (VR) textbooks,

augmented reality (AR) laboratories,

AI teachers,

fully automated assessment systems,

AI analyzing the psychological state of students.[5]

Artificial intelligence has the potential to make education not only innovative, but also easy, convenient and effective.

In short, Smart classrooms are a new stage for traditional school education. AI makes the educational process:

personalized,

fast,

efficient,

digitalized,

adaptive.

The communication between the teacher and the student will be strengthened, the assessment system will be impartial, and the motivation of the students will increase. Despite the technical problems, smart classrooms are becoming an integral part of the global education system.

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