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Application of Modern Technologies and Artificial Intelligence in Education

Abstract

The article discusses the application of artificial intelligence in modern education as a teacher, in production, problem-solving that occurs in the process of teaching based on pedagogical skills and new pedagogical technology. Recently, the use of artificial intelligence has become increasingly widespread in various areas of our lives, in medicine, finance, banking and business, mechanical engineering, aviation and even in education.

With the advent of new technologies such as cloud computing, big data and deep learning, educational institutions have unique opportunities to integrate AI into the classroom process.

The use of artificial intelligence in education can lead to significant improvements in the quality of education, including more personalized learning, more efficient learning processes, and the development of critical thinking and creative expression in students, both students and students.

In this article, we will look at various aspects of the use of AI in education, discuss its advantages and disadvantages, and consider possible strategies for integrating AI into the educational process. Our goal is not only to review the current state of AI use in education, but also to provide recommendations and solutions for the effective use of this technology in the future.

Keywords: *teacher, education, artificial intelligence, process, machinery*

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Müasir texnologiyaların və süni intellektin təhsildə tətbiqi

Xülasə

Məqalədə pedaqoji bacarıqlara və yeni pedaqoji texnologiyaya əsaslanan tədris prosesində baş verən problemlərin həllində müəllim kimi, istehsalatda süni intellektin müasir təhsildə tətbiqindən

bəhs edilir. Son zamanlar süni intellektin istifadəsi həyatımızın müxtəlif sahələrində, tibbdə, maliyyədə, bank və biznesdə, maşınqayırmada, aviasiyada və hətta təhsildə getdikcə daha geniş yayılıb.

Bulud hesablamaları, böyük verilənlər və dərin öyrənmə kimi yeni texnologiyaların meydana çıxması ilə təhsil müəssisələri AI-ni sinif prosesinə inteqrasiya etmək üçün unikal imkanlara malikdir.

Təhsildə süni intellektin istifadəsi təhsilin keyfiyyətinin əhəmiyyətli dərəcədə yüksəlməsinə, o cümlədən daha fərdiləşdirilmiş təlimə, daha səmərəli təlim proseslərinə, həm də tələbələrdə tənqidi təfəkkürün və yaradıcı ifadənin inkişafına səbəb ola bilər.

Bu yazıda biz təhsildə süni intellektdən istifadənin müxtəlif aspektlərini nəzərdən keçirəcəyik, onun üstünlüklərini və mənfi cəhətlərini müzakirə edəcəyik və AI-nin təhsil prosesinə inteqrasiyası üçün mümkün strategiyaları nəzərdən keçirəcəyik. Məqsədimiz təkcə təhsildə süni intellektdən istifadənin mövcud vəziyyətini nəzərdən keçirmək deyil, həm də gələcəkdə bu texnologiyadan səmərəli istifadə üçün tövsiyələr və həllər təqdim etməkdir.

Açar sözlər: *müəllim, təhsil, süni intellekt, proses, mexanizm*

Introduction

Recently, the use of artificial intelligence has become increasingly widespread in various areas of our lives, in medicine, finance, banking and business, mechanical engineering, aviation and even in education.

With the advent of new technologies such as cloud computing, big data and deep learning, educational institutions have unique opportunities to integrate AI into the classroom process.

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One of the main advantages of using artificial intelligence in education is the ability to personalize the educational process: Using artificial intelligence algorithms, you can analyze student data, identify individual needs and teach material in accordance with the level of knowledge, skills and abilities of each student. This allows students to learn more effectively, speeds up their progress and reduces learning time.

And it should also be noted that the educational landscape is undergoing significant changes due to the integration of modern technology and artificial intelligence (AI). These innovations are reshaping how teachers teach and how students learn, fostering more interactive and personalized learning experiences. As technology continues to evolve, its use in education offers tremendous opportunities to increase participation, accessibility, and overall learning outcomes. This article explores these applications, providing insight into current research and future implications.

Research

The use of artificial intelligence in education can also help organize the learning process. It can be used to automate administrative tasks such as class scheduling, resource management, and budgeting.

If we touch on a number of important aspects, first of all we say Personalized Learning. AI technologies have enabled personalized learning experiences tailored to individual student needs. Intelligent tutoring systems, such as Carnegie Learning and Dream Box, utilize algorithms to analyze student performance and adapt the content accordingly. Research by Pane et al. (Pane, Steiner, Baird, Hamilton, 2015) demonstrates that personalized learning environments can significantly improve student achievement by allowing learners to progress at their own pace and focus on areas where they need the most support. Modern technologies like virtual reality (VR) and augmented reality (AR) are enhancing student engagement by creating immersive learning experiences. For instance, platforms like Nearpod and Google Expeditions allow students to explore historical landmarks or scientific concepts in an interactive format. A study by Mikropoulos and Natsis (Mikropoulos, Natsis, 2011,

p.55-62) indicates that such immersive technologies can increase motivation and comprehension, particularly in complex subjects. The integration of AI in education facilitates the collection and analysis of vast amounts of data to inform teaching practices. Learning Management Systems (LMS), such as Canvas and Blackboard, employ analytics tools to monitor student progress and engagement. Siemens (Siemens, 2013, p.1-5) highlights that data-driven insights can help educators identify at-risk students and tailor interventions effectively, ultimately enhancing student outcomes. AI also streamlines administrative tasks, allowing educators to focus more on teaching. Automated grading systems and chatbots can handle routine inquiries, freeing up valuable time for teachers. A report by the Brookings Institution (Brookings Institution, 2017) suggests that this efficiency not only saves time but also allows educators to concentrate on instructional planning and student interaction, improving the quality of education. Modern technologies contribute to making education more accessible for diverse learners. Tools such as speech recognition software and translation services can assist students with disabilities and those from different linguistic backgrounds. Research by Al-Azawei et al. (Al-Azawei, Serenko, Halla, 2016, p.119-143) emphasizes that technology can help bridge educational gaps, providing equitable learning opportunities for all students. Tools like Read&Write and Otter.ai support students with disabilities by providing text-to-speech, speech-to-text, and transcription services, fostering a more inclusive environment. Universal Design for Learning (UDL): Discuss the principles of UDL, which advocate for flexible learning environments that accommodate individual learning differences, supported by technology. And also AI can analyze teacher performance data to recommend personalized professional development resources, helping educators improve their instructional practices. Highlight the importance of continuous training for educators to effectively integrate these technologies into their teaching.

One successful example of the use of AI in education is the Smart Sparrow system, a cloud-based adaptive learning platform that personalizes the learning experience. Smart Sparrow allows educators to create interactive learning materials that adapt to students' knowledge levels. Another emerging trend involves the development of intelligent tutors and educational robots. AI-based tutors can work with individual students, analyze their academic progress, and create personalized educational materials and assignments. Educational robots can assist in teaching precise skills, such as in medicine and engineering.

This reduces the burden on administrators and teachers, allowing them to focus on their primary task of teaching students.

One of the successful examples of the use of artificial intelligence in education is the “Smart Sparrow” system. It is a cloud-based adaptive learning platform powered by artificial intelligence that personalizes the learning experience. Smart Sparrow makes learning more effective by allowing you to create interactive learning materials that adapt to the student's knowledge level.

Another important benefit of using AI in education is the personalization of learning: AI can analyze the behavior and learning situation of each student, determine their strengths and weaknesses, and based on this, create personalized learning programs that best suit the needs of each student. This leads to more effective learning and improved academic performance.

AI can also be used to analyze data and identify trends in education. For example, it can determine which teaching methods are most effective, which subjects are most difficult for students, and which degree programs are most in demand in the job market. This information can be used to optimize training programs and improve the quality of education in general.

There are other methods of using AI in education - the development of intelligent teachers and educational robots: AI-based tutors can work with individual students, analyze their academic progress and create individual educational materials and assignments. Educational robots can help teach skills that require a high degree of precision and repeatability, such as medicine and engineering. Artificial intelligence based on current midterm and other grades can also be used to automatically grade courses and tests. This can significantly reduce the time teachers spend grading papers and reduce the likelihood of errors. In addition, automatic grading can provide students with quick feedback, motivating them to study further and achieve better results. One simple example is the “HEMIS” system, which was launched at the end of 2021 in universities in Uzbekistan. “HEMIS”

is an information system for managing higher education processes, which will allow administrative, educational, scientific and financial areas to be transferred into electronic format. It is also an electronic education information system that provides its services to automate the main activities of higher education institutions which is aimed at improving the quality of education and increasing the efficiency of administrative staff, teaching staff and students.

Artificial intelligence can also be used to predict student performance. Machine learning algorithms can analyze student performance data and identify the factors that most impact student performance. Based on this data, strategies can be developed to improve academic performance, such as extracurricular activities or one-on-one tutoring.

AI can also help teachers tailor learning materials to the needs of individual students and provide a personalized learning experience.

However, as in other areas, there are risks and concerns associated with the use of AI in education. For example, automated grading of student work may not always be fair, and personalized learning approaches may exacerbate problems of student segregation based on different criteria such as race or status.

There are also concerns about student data privacy when artificial intelligence is used to analyze and store large amounts of personal data. It is important to take appropriate security measures and be vigilant about protecting student data.

Overall, the use of AI in education has the potential to significantly improve the quality of education and learning outcomes. However, as in other areas, risks and limitations must be considered. For example, it is important to remember the importance of interpersonal and social interaction in learning: The use of AI should not replace the teacher and interpersonal communication in the learning process, but rather complement it and make it more effective.

With the development of technology and artificial intelligence (AI), more and more questions arise about how this can affect our lives and the educational system in particular. One of the most interesting and challenging issues is the possibility of replacing teachers with robots and using AI as teachers. In this article we will look at this topic and analyze all its aspects.

Can a robot become a teacher?

✓ First, consider the possibility of replacing teachers with robots. Robots are already being successfully used in various fields, and education is no exception. Using robots as educators can lead to a number of benefits.

✓ Firstly, robots do not get tired or lose patience. This can be especially helpful when working with children who may be unruly and attention-deficient.

✓ Robots can repeat the same explanation several times without getting tired or losing patience, whereas a human can get tired and lose concentration.

✓ Secondly, robots can be more accurate and objective than humans. The robot will not prefer one student to another, will not have personal biases and preferences, which can lead to a more fair and objective assessment of educational achievements.

✓ Third, robots can access a large amount of knowledge and analyze data quickly. They can review a large number of materials and select those that are most relevant to a particular student, which can help with personalized learning.

However, despite all these advantages, there are some limitations. A robot cannot completely replace a teacher because it does not have empathy and the ability to understand the emotions and feelings of students. These qualities are very important for effective teaching as they help the teacher to better understand the needs and potential of the students.

Can AI replace teachers in education?

With the development of artificial intelligence (AI), more people are wondering whether AI can replace teachers in education. Some representatives of the educational community see this as an opportunity to solve some problems, such as the lack of qualified teachers, limited teaching resources, etc.

However, others fear that the use of AI could lead to a loss of humanity and personalization in education.

There are already robotic teachers that are used in some schools and universities to teach students. They have the ability to recognize faces, voices and gestures, which allows them to interact with students and adapt to their needs. One example of such robots is NAO, developed by the French company Aldebaran Robotics. It can be used both as a teaching tool and as a social robot for working with children with autism spectrum disorders. In Japan, there are already robot teachers who teach children in kindergartens and primary classes.

Various versions of the robot have been released since 2008. The academic version of Nao was developed for research and teaching at universities and research centers; it was released to institutions in 2008 and became generally available in 2011. Since then, several updates to the Nao platform have been released, including Nao Next Gen 2011 and Nao Evolution 2014.

Nao robots are used for research and teaching in many academic institutions around the world; as of 2015, over several thousand Nao devices are in use in over 50 countries.

The robots are knee-high and move like children. The school uses them to teach phonics and play cards or memory and imitation games with children aged five to 10 years.

However, there are also arguments against the use of AI in education. Some scientists believe that AI cannot completely replace the teacher in the pedagogical process. This is because AI cannot replace human experience, intuition and emotional intelligence, which are essential interactions between teacher and student.

Teachers typically have the ability to adapt to each student's individual needs using a variety of teaching methods and materials. AI, in turn, works according to a predetermined program that is not able to adapt to a specific student.

Despite this, there are also positive aspects of using AI in education. It can be useful as an addition to the teacher, making his job easier and helping students better understand the material. AI can provide an individual approach to each student, taking into account his needs and level of knowledge. It can also help students with developmental disabilities, such as hearing, vision, or attention difficulties, by providing them with additional support and resources.

Thus, we can conclude that AI cannot completely replace teachers in education, but it can help teachers become more effective by freeing them from some routine tasks. It can also help students with developmental disabilities, such as hearing, vision, or attention difficulties, by providing them with additional support and resources.

Thus, we can conclude that AI cannot completely replace teachers in education, but it can help teachers become more effective by freeing them from some routine tasks.

Conclusion

In conclusion, AI has enormous potential to improve education and make it more efficient. Its use can lead to more personalized and effective learning, improved educational quality and accessibility for all students. However, to achieve maximum results from the use of AI in education, it is necessary to carefully analyze its potential and limitations, consider ethical and legal aspects, and combine it with interpersonal communication and social interaction in the educational process.

The application of modern technologies and artificial intelligence in education offers transformative potential for enhancing teaching and learning. Personalized learning, improved engagement, data-driven insights, and increased accessibility are just a few of the benefits these technologies bring to the educational landscape. However, challenges such as digital equity, privacy concerns, and the need for effective teacher training must be addressed to maximize their impact. As we look to the future, a balanced approach that combines technology with sound pedagogical practices will be essential in creating a more effective and inclusive educational system.

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