

THE PERSPECTIVES OF ARTIFICIAL INTELLIGENCE IN EDUCATION

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Abstract. This article examines the application of artificial intelligence in education, as well as solutions for personalized learning and career guidance. The need for integrating artificial intelligence into the learning process, as well as the technologies already in use, is identified and analyzed. The potential for using artificial intelligence in personalized learning is presented. Having analyzed the potential applications of artificial intelligence, we conclude that there is a need to utilize and improve neural network and artificial intelligence technologies in education. The purpose of this article is to explore the impact of artificial intelligence on the educational process and students, identify its advantages and disadvantages, and offer recommendations for the appropriate use of AI for educational purposes. The main objectives of the article include: Analyzing the opportunities and benefits of AI in education. Assessing the risks and challenges associated with using AI for teaching. Discussing the role of AI in developing critical thinking and self-regulation skills in students. Proposing strategies and recommendations for the effective and ethical use of AI in educational institutions. Considering the sociocultural and ethical aspects of using AI in the educational process. This article will be useful to students, teachers, educational administrators, and researchers interested in integrating AI into the educational environment. Artificial intelligence (AI) has become an integral part of the modern educational system, offering innovative solutions for improving the quality of learning and personalizing the learning process. In this section, we will examine various AI technologies used in education and provide examples of their successful implementation. Modern educational systems utilize a variety of AI technologies, each of which contributes to improving the learning process.

Keywords: innovations in education, artificial intelligence, learning, cross-cutting technologies, vocational education, personalize.

Introduction.

Artificial intelligence (AI) technologies emerged in the 1950s, when the first experiments began to create systems that mimic the human mind. The term "artificial intelligence" was coined at a seminar held by John McCarthy in 1956. Initially, AI algorithms were applied in specialized fields such as data analysis, machine translation, and pattern recognition. Over time, increasing computing power allowed the development of systems that more accurately imitate human thought. Based on the definition of AI as "a set of technological solutions that makes it possible to imitate human cognitive functions (including self-learning and finding

solutions without a predetermined algorithm) and to obtain results in performing specific tasks at least comparable to the results of human intellectual activity" [1], it can be argued that the use of AI in education, despite its benefits, carries certain challenges and risks. Questions about the impact on values, security, and the future of education and the labor market remain open. When we talk about artificial intelligence, we mean

technologies that imitate human thinking: they understand text and speech, draw conclusions, learn from experience, and can offer informed decisions. In the educational context, this refers to a set of intelligent assistants integrated into the learning process—from course development to student support. It should be noted that the innovative activity of recent years has led to the rapid development of high technologies, including AI technologies that are applicable in various fields. They speed up business processes, allow you to perform work in difficult and extreme conditions, increase labour productivity, free a person from routine, creative work.

However, AI cannot replace a person due to its narrow specialization and dependence on people (Gorodnova, 2021).

AI technologies will continue to develop. Some jobs will be serviced exclusively by robots, but at the same time, completely new jobs will appear, and professions for people that involve them performing new creative tasks. As a result, the future of production is seen as a tandem of man and robot based on their partnership. Experts believe that AI technologies have a larger impact than electricity or fire. We can agree with the researchers that the next technological revolution will be based on AI. In any case, the development of high technologies in the future is the desire to achieve sustainable economic growth and ensure national security. Consideration of the importance of using artificial intelligence in education is driven by the need to develop programs and tools for personalizing the educational process to improve the quality and effectiveness of learning. Recently, one can often hear about the penetration of artificial intelligence into all spheres of human activity, including education. In this study, we will attempt to understand what this represents and how it will impact the development of society and education. In general, neural networks are a mathematical model, a massive computational code capable of producing a prediction by solving a given intellectual problem based on evaluating the criteria of a given question. By analyzing a vast amount of information and databases, artificial intelligence generates the most realistic and accurate answer. The advantage of neural networks lies in their learnability; they can learn independently, without the direct involvement of an IT specialist [7, 8, 14]. Artificial intelligence, or machine learning, is currently being actively used in education, ranging from administering and marking exams to automatically selecting material for students in areas where they are experiencing learning difficulties, encouraging students to more consciously engage with the topic, improve their knowledge and abilities, analyzing student performance and productivity, and adjusting their learning plan under the constant and loyal control of an "unfeeling" machine [3, 5]. Artificial intelligence is being actively integrated into the learning process, and it is becoming clear that the scale of the use of these end-to-end technologies will only increase annually. Let's consider the main areas of artificial intelligence use in education today: Automation of routine tasks. Teachers have always borne a significant amount of responsibility and work with students – monitoring academic progress, checking standard assignments, assessing knowledge levels, and preparing for classes. Such routine tasks take away significant time from the valuable learning process in the classroom. To improve the efficiency and quality of education, it is now possible to delegate such routine work to artificial intelligence. Let's agree that a human could never process the amount of text and other information that artificial intelligence can process. Human errors, which artificial intelligence cannot make, are also eliminated. Much is being said these days about the personalization of learning. By integrating artificial

intelligence technologies into the educational environment, it is possible to create personalized study plans for each discipline during specialist training, and subsequently implement monitoring of student performance. This application of artificial intelligence in education is becoming possible thanks to the development by educators and psychologists of methods for assessing students' abilities, motivation, willpower, and other characteristics, which are then used to develop individualized learning programs.

The creation of educational apps and specialized content for students also contributes to the personalization of the learning process. This feature is actively used by many students and teachers [1, 4].

For example, in teaching foreign languages in different formats using a single app. The technology allows student speech recognition, analyzing sentence structure, vocabulary, and grammar, and providing additional assignments of similar content for repeated review of the material. These apps are very popular because they are becoming a routine activity on gadgets for many people. In addition to learning foreign languages, the technology is applicable to all subjects and is already beginning to gain success with both students and teachers.

Personalized learning is a method of developing and implementing an educational plan, in which the student is the subject of the educational process, taking into account their individual characteristics. To increase the effectiveness of the educational process through personalization, both teachers and students must utilize the capabilities of artificial intelligence. Artificial intelligence is capable of collecting and analyzing large amounts of disparate data, and then derive a comprehensive picture of the situation. Furthermore, artificial intelligence can predict its development from a starting point and suggest options for adjusting it based on the needs. Applied to the educational process, artificial intelligence can identify specific disciplines or areas within these disciplines in which students are experiencing problems. This helps analyze the current situation and identify where the student needs additional assistance. Moreover, at each subsequent point in time, the technology can determine the need to reduce or increase the amount of this assistance. This concept can help create a personalized learning path, taking into account such parameters as interest in the topic, psychological state, ability to perceive specific information at a given moment, etc.

In the digital age, in addition to mastering professional competencies (hard skills), developing soft skills is essential. Ever-increasing amounts of information and knowledge have a profound impact on the human brain. It's impossible to absorb all this information, but artificial intelligence can assist in various tasks, helping develop students' critical thinking and creativity. Today, end-to end technologies can be excellent tools for collecting and filtering information, helping students learn more effectively and teachers improve the quality of their learning.

Neural networks are rapidly gaining interest among educational institutions and platforms. By analyzing students' activities, artificial intelligence can automatically identify weaknesses in their performance in certain subjects, which in turn indicates to teachers the need for additional intervention and, ultimately, assistance in addressing student performance. The concept of introducing artificial intelligence into the educational process is aimed at personalizing the system, adapting it to the abilities of students, as well as monitoring the social component, convenience, and practicality of use [2, 6].

Artificial intelligence can also analyze students' interests and suggest programs and courses accordingly. A personalized approach helps engage students in the learning process and monitor their independent completion of assignments during distance learning or independent learning [10, 13].

The digital world is a vast stream of information, which humans cannot process and analyze, so let technology do it for them. Neural networks can help manage the routine work of teachers, checking tests, coursework, and voluminous homework. The ability to identify various types of errors in writing, solving tests, and solving mathematical equations, even complex ones, is a huge discovery for the field of education, and a very useful tool for teachers.

Another problem in modern education that can be solved with the help of neural networks is career guidance, which is aimed not only at preparing students for career choices but also at assisting them in self-determination and subsequent employment. The machine-generated analysis of responses to diverse questions, based on a logical chain, yields a detailed picture of a person's abilities and interests. It works like this: a testing system developed by an Uzbek group of leading teachers in various fields serves as input for the neural network, using the results of the very

tests offered to students. The questions are selected and formulated according to clear requirements reflecting the level of professionalism and awareness in specific areas of education. After the data is entered, the code, using the machine learning model, produces a result, which is a numerical index of the areas in which the test-takers should further develop.

The benefits of AI for students are clear: personalized learning, access to instant help, automation of routine tasks, and improved educational quality through data analysis. However, it is important to remember that the use of AI must be conscious and balanced to avoid potential negative consequences. While artificial intelligence (AI) brings numerous benefits to education, its use also has drawbacks and challenges that must be considered: One of the main drawbacks of AI is the potential for students to acquire superficial knowledge. Because AI can provide answers to questions instantly, without the need for independent analysis and thought, there is a risk that students may rely solely on ready-made answers without delving deeper into the topic being studied. This can lead to a superficial understanding of the material and insufficient development of critical thinking. The use of AI in education can create student dependence on technology and reduce their ability to independently solve educational problems. If students become accustomed to receiving instant answers from AI to any question, they may lose motivation for independent research and learning. Without developing independent study and information retrieval skills, students may be unable to solve problems in the real world where there is no access to technological support. It is important to note that the use of end-to-end technologies, particularly artificial intelligence and neural networks, can significantly improve learning effectiveness, foster students' digital and information culture, and personalize the learning process [11].

Furthermore, the use of end-to-end technologies will allow for the monitoring and adjustment of the educational process, which better aligns with the requirements of a modern digital society. It will now be much easier for applicants to choose a profession when applying to educational institutions, as machines analyze only the input

information provided by the students themselves, without the imposition of the opinions of society, parents, and peers.

Artificial intelligence is already capable of many things, but its primary function is collecting and analyzing data, generating results, and making predictions. The latest developments in AI are based on adaptive learning, as this type of learning is based on interactive models that take into account the individual characteristics and needs of each learner. [4]

Currently, saying obviously, many educational institutions are developing and also implementing AI systems in education. Various online courses, educational videos, text materials, and interactive modules are used in the classes. These systems automatically assess students' knowledge, identify weaknesses, and provide feedback with further instructions on how to improve their skills. Thus, platforms utilize AI in different ways depending on the various goals and objectives set in the educational environment, but the use of such applications and platforms helps make the learning process interactive, engaging, and, most importantly, effective.

Conclusions.

In conclusion, we would like to emphasize that the use of AI in education opens up new opportunities for creating more effective and personalized learning processes. However, to achieve maximum impact, it is important to consider both the benefits and potential risks and drawbacks. AI in education offers numerous advantages that can significantly improve the quality of learning and help students achieve better results. Let's consider the main ones: One of the main advantages of AI is the ability to personalize the learning process. Thanks to adaptive educational systems, educational materials and teaching methods can be tailored to the individual needs of each student. This is achieved by analyzing data on

students' performance, preferences, and learning styles.

Artificial intelligence facilitates the optimization of learning approaches based on the needs and characteristics of each student. This is precisely the rationale for using this technology in education for its personalization. It should also be understood that artificial intelligence is not the only modern technology; it is closely intertwined with other cross-cutting technologies (big data, robotics and sensors, the Internet of Things, cloud technologies, augmented and virtual reality technologies, quantum technologies, new manufacturing technologies), the use of which guarantees the successful professional activity of all participants in the educational process. AI technologies such as chat-bots and virtual assistants provide students with 24/7 support. Unlike traditional methods, where teacher assistance is limited to class or consultation hours, AI systems can answer students' questions at any time. This is especially useful when preparing for exams or homework, when time is of the essence. For example, AI-powered chat-bots can provide explanations of complex concepts, help find the information they need, or suggest the correct approach to solving a problem. AI can automate many routine tasks, such as grading homework and tests. This not only frees up teachers' time for more productive work with students but also allows

students to receive feedback much more quickly. Automatic grading systems can grade tests and assignments almost instantly, facilitating prompt error correction and improving academic performance. For example, an AI-powered automatic essay grading system can analyze grammar errors, style, and text structure, providing detailed recommendations for improvement. AI analyzes massive amounts of data collected

during the learning process, allowing it to identify trends and predict outcomes. This helps teachers and administrators make informed decisions to improve the learning process. On the one hand, this helps find answers and solve problems faster. On the other hand, there's a risk that students will stop learning to think independently when they receive a ready-made solution. Artificial intelligence in education is not an enemy or a nation, but a new, real partner. Ignoring AI is impossible, as it is increasingly penetrating education. However, the key to success is conscious application. It's important to clearly understand why we're implementing a particular technology and what results we want to achieve. AI should solve specific problems, not be introduced for the sake of a buzzword in a report. Artificial intelligence for learning isn't a replacement for teachers, but a smart assistant that takes on routine tasks and helps make lessons more engaging. While some teachers spend hours creating tests and searching for materials, others are already using AI to speed up preparation and find fresh ideas for their lessons. The use of AI in education can impact students' learning and social skills. For example, reliance on technology and virtual assistants can reduce students' interpersonal communication and collaboration skills. The use of AI must be balanced with traditional teaching methods that foster the development of social and communication skills. The risks of introducing artificial intelligence into education should not be overlooked.

Several threats to the introduction of AI into human activities are already known. First, there's the potential for employment. Fewer people are needed to use AI technologies in education, leading to fewer jobs.

However, some experts (Stephen Hawking, Elon Musk) have suggested that artificially intelligent machines could eventually gain sentience and turn against humanity if their programming is compromised or used improperly. [7] Thus, one can conclude that artificial intelligence, like all technological innovations, has its advantages and disadvantages. However, it is expected that the integration of AI into the educational process will become more widespread as technology advances. These technologies are evolving in response to societal demands and are aimed at enhancing the effectiveness of the teacher-student learning process. It is difficult for a single teacher to meet the needs of a large class of modern students. In today's reality, the introduction of AI-based applications into education is no longer a fantasy. This approach solves the problem of low quality of education, the problem of inaccessibility of education, and also minimizes, as far as possible, the shortcomings of the existing education system.

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