

PROSPECTS AND IMPLICATIONS OF ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION**Mamatov N.,**

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Abstract

The development of artificial intelligence (AI) has created the problem of analyzing and revising the entire world's educational process. This is inextricably linked with the strong interest in using AI in the educational process and the differences between its practical application. Some business representatives consider modern universities to be factories for mass production of higher education diplomas. Employers often emphasize that educational standards and programs do not meet the requirements of modern times, and the need to retrain graduates. This article is devoted to the prospects and consequences of the use of AI in higher education, which includes the stages of AI development, negative and positive effects on the educational process, the use of AI technologies in the educational process, its economic and moral importance, student and AI mutual relations, social effects are described.

Keywords: artificial intelligence(AI), IT, algorithm, virtual reality, robotics, machine learning, ChatGPT.

Introduction

In order for higher education institutions to keep up with the times, powerful solutions are required to optimize and update the content of the educational process. In this case, continuous education must become the theoretical basis of future changes. It is necessary to introduce educational IT products based on AI, big data processing and machine learning into the educational process corresponding to the economic mega-trend of the near future [26].

At the next stage of informatization of higher education institutions, it is necessary not only to solve the systemic problems accumulated in educational institutions but also to transfer AI technologies to a new level in terms of quality. In recent years, machines have become almost human-like in analyzing texts, recognizing gestures and speech. The next goal should be to create and improve virtual teachers and bot assistants with strong knowledge [24].

It is necessary to take into account the common interests of software developers, employers and educational institutions. Also, it is appropriate for higher education to accept the market's demand for transformation, develop not only educational technologies, but also the software development market in general and make a great contribution to the development of IT startups [25].

The introduction of AI technologies into education began in the 70s of the last century when researchers sought answers to the question of how computers should provide an individual approach to education. However, this is not the most efficient and currently not

available to many people. Early attempts were based on the use of AI methods based on rules for automatic or personalization of learning for each student, and to date, the development of the use of AI technologies in education is carried out as student, teacher and system-oriented AI. The relationship between AI and education goes beyond the use of AI to include learning about AI technologies and preparing citizens for life. The introduction of AI technologies in education has the opportunity to clarify many issues of pedagogy, organizational structures, ethics, justice and sustainability because a good and thorough understanding of it is necessary to automate the process [1].

N.A. Korovnikova showed that there are a number of threats related to the effective organization of the educational process and all subjects when introducing the modern education system to the rapidly developing AI [2]. The following categories of risk factors are of greatest concern:

- 1) Emergence of "digital divide" or "digital inequality" leading to certain social stratification. This phenomenon means that there is no uniform use of information and communication technologies for all subjects of the educational process. Its direct result is limiting the opportunities and living standards of social groups that are deprived and cannot use new digital tools. As noted by S. Duggan in his analytical note of the UNESCO Institute of Information Technologies in Education, about 43 percent of the world's population still has free access to the Internet, and almost 40 percent of people never have the opportunity to use its

capabilities. Students with limited access to educational information and relatively few opportunities to create and share electronic information face various challenges in shaping individual learning trajectories that adequately identify and meet their needs comes from [3].

2) The emergence of a type of dependence on technology can cause some students to significantly decrease their knowledge and creativity.

3) Inadequate coordination of ethical principles for the wide introduction of AI in the educational space, which creates the problem of ensuring confidentiality, responsibility, and concealment of the use of information and technologies of the participants of the educational process, and the inability to exercise control over them.

4) The need for continuous improvement of competence in the field of digital technologies for absolutely all aspects of the educational and pedagogical process and the demands placed on organizations regardless of the material conditions and level of technical equipment.

5) Groundlessness and superficiality of AI decisions in the field of psychological and emotional knowledge. Also, interactions are related to the inability to perceive a wide range of socio-psychological forms of technologies and internal feelings expressed by a person.

6) Bringing the knowledge and skills acquired in the subjects to a single format, as well as excessive formalization of these professional competencies, leads to a significant decrease in the performance of graduating students.

7) The reduced or complete absence of communication outside the virtual world has a negative effect on the effectiveness of most educational subjects.

8) Changes in brain activity and abnormally significant stress in mental state cause memory impairment [3,4].

The authors of another theoretical study on AI in education emphasized the co-existence of positive aspects and risks caused by technology in the context of digital globalization. According to I.B. Aleshina, AI systems are currently engaged in solving the following tasks within the framework of higher education [2]:

- Involve a specialist consultant in the process, who can identify reserves and analyze student data to achieve personal educational goals, and can make recommendations for studying specific subjects or correct existing assumptions about work in the labor market by establishing a correspondence between students' expectations and their actual capabilities, which allows overcoming the barrier between students;

- optimization of educational materials based on incoming feedback in real time. On the basis of advanced technologies, the academic performance of a particular student is analyzed and the degree of mastering of certain parts of the given materials is determined, thereby creating an idea of the most problematic areas that require the teacher's attention;

- through the introduction of personalized education, students can choose the methods and forms of education suitable for their personal characteristics,

as well as attract the opportunity to divide the audience into educational groups according to the specific characteristics of their interests, abilities and motivation of each student;

- improving and adjusting the work format of the higher education institution, which includes those who are more or less ready to study a certain course according to different categories of students. AI systems demonstrate the ability to identify missing knowledge in students and then reduce it by identifying and processing missing material for full mastery of the discipline;

- introduction of a learning process based on experiential training or accumulated experience. The student is given the opportunity to do something independently, and as a result, he develops the skills of seeking and applying knowledge by immersion in virtual and augmented reality.

I.V. Alyoshina separately emphasized a number of advantages of using AI systems in higher education. In particular, he listed some of the risks associated with negative changes in the work of educational institutions due to the relatively weak development of technological infrastructure and information culture, that is, the following risks of advanced technologies:

- global threats related to the possibility of personal information collected in real time, including parameters such as attendance, academic performance, portfolio, and unauthorized use of not only student personal information;

- modern innovation systems are mainly based on past experiences, however, the use of the extrapolation method, which includes the study of the history of the development of events and current trends, and the projection into the future in order to predict them, seems to be insufficiently effective. The time period is inherently probabilistic and does not exclude the possibility of various unexpected factors and circumstances. Based on this, the predictive nature of predictive analysis decisions based on historical data and the involvement of specialists accompanying the work of AI systems are extremely important;

- digital technology decisions are made based on algorithms, evaluation criteria, and other parameters set by system users or developers. Sometimes they can cause unclear or even negative reactions due to lack of understanding of working mechanisms and distrust. It is very important that the algorithms are open to the public and transparent. The discussion of the parameters must be organized in order to form a clear picture of the public's ideas about the adequacy, reliability and expediency of their use;

- the risk of making mistakes and sharing the responsibility of creators, experts and users. It is desirable to separate the work of the AI from the activities of the teaching staff, because the technology system cannot fully function without people and can miss important mistakes;

- The possibility of hacking, undetected changes in algorithms and wrong or false decisions will depend on the consequences of globalization and digital transformation. Such actions open the possibility of large-scale abuse for the benefit of certain

individuals or associations, and also create the risk of large-scale system control of AI. In this case, the trust system can act as a kind of security guarantee;

- devaluation of human capital, rapid changes in technology, and replacement of highly qualified specialists with them can be reflected in depriving society and individuals of their contribution to education [1].

Use of AI technologies in the educational process. AI technologies can be widely used in various fields. Including industry, construction, transport, communications, education, science, healthcare, finance, trade, culture, tourism, housing and communal economy, etc. The use of AI can lead to significant changes in the field of education and create new opportunities for restructuring the entire process. The widespread introduction of AI technologies in the field of education increases the effectiveness of the educational process and the resources spent on its organization [5]. The AI system of the educational process must include the following elements [6]:

- an information search system that ensures the formation of a database of the educational process from various sources;
- an automatically updating library of electronic textbooks, manuals and instructions;
- a system for monitoring students' knowledge level, a part system for continuous monitoring of their educational activities and results;
- a library of automatic control tasks that can be adapted to the level of training according to the results of each student;
- automated system of academic workload planning and distribution;
- a service system that provides communication between a student and an educational organization. Wide use of technology in education can play an important role in the lifelong learning and development of a person. Advanced technologies of the 4th industry can be shown separately in the content and tools of modern education [7]:
- internet of things. For example, educational and remote laboratories;
- additional production. 3D printers, 3D modeling in educational workshops, production of robotic parts, technical devices in additional training of students;
- AI, machine learning and robotics. Using avatars and chatbots in the learning process to advise, test and design individualized learning paths for students, and using real robots in distance learning;
- big data, blockchain and cloud computing. Formation of secure portfolios of students and teachers, educational and professional competencies and extensive use of cloud technologies in the educational process;
- virtual and augmented reality. Full use of simulation laboratory stands and laboratory facilities with elements of augmented reality in the educational process. Higher education institutions should not only be carriers of academic tradition and system-wide efficiency, but also have excellent opportunities for innovation and non-standard initiatives. By realizing

this fact, it is possible to further increase the potential of higher education system transformation [8].

The economic and ethical importance of AI.

The impact of AI on the education system is manifested in two main directions. The first thing is that the expansion of the use of AI in business processes imposes new requirements on the knowledge, skills and abilities that the future employee must have. The changes will affect everyone - both highly skilled professionals and low skilled workers. "Innovations in robotics and machine learning are changing workplaces every day, deforming some tasks and introducing new ones" [14,15]. It is necessary to talk separately about the formation of the digital ecosystem. The digital ecosystem will redefine basic human values, including our current understanding of work and wealth [18]. In order to meet such demands, it is necessary to constantly improve the higher education system. The second thing is that AI algorithms significantly improve the field of education and adapt it to modern realities.

Understanding the essence of the given topic requires the following approximate sequence of actions. Digitization of the economy, in particular, analysis of the main trends in the use of AI, formation of new requirements for the use of AI algorithms in the educational process, determination of the direction of use of AI in the higher education system, i.e. replacing teachers or improving the functions of teachers to make it convenient. Determining the costs and benefits of introducing AI into the educational process, carrying out a quantitative and qualitative assessment. Quantitative and qualitative assessment must serve to create new opportunities for the educational process.

The near future requires the separation of macro and micro levels of AI use in the higher education system. In particular, it is related to taking into account the costs of using AI in the educational process at the national level or at the level of a separate educational institution. It is appropriate to compare the costs and benefits of using AI in the higher education system and make a decision.

Before considering the ethical dilemmas and problems that may arise from the widespread use of AI technologies, it is necessary to understand the concept of "AI ethics". AI ethics is a field concerned with the study of ethical issues in AI, and as AI develops, so do the problems associated with its use. Although the concept of "machine ethics" was proposed in 2006, AI ethics is still in the process of formation. In the context of AI, it is necessary to define the ethics of AI and the ethical obligations of its creators, because the tools and methods used in AI technologies can be misused by authorities and others with access to them.

Today, the use of AI technologies makes it possible to solve various production and management tasks many times more efficiently. However, the development of these technologies raises a number of legal and ethical issues. From the point of view of the average consumer, the issue of AI ethics is often related to the privacy and security of personal data, the distribution of personal data, their transfer to a third party, subjects such as the misuse of information about social networks and search sites are widely discussed today. In the

framework of public opinion, large IT companies such as Google, META, Yandex, Apple and Microsoft leave open many questions regarding the legality of data acquisition and the use of facial recognition systems and the security of data obtained from surveillance cameras. Also, organizations operating in the field of trade face various criticisms in the use of information about customer preferences and search queries [13].

Student-AI interactions. Algorithms are perceived by many researchers not as simple new technology that improves the capabilities of economic agents, but as a qualitative achievement. Therefore, an idealistic approach to the use of AI is now widespread. Previously, researchers analyzed the problem of trust between human and computer [19], and now the relationship between student and AI is relatively important. Many articles have pointed out that students' lack of trust in higher education support assessment systems managed by AIs is related to affective components of trust [29].

The problem of confidence in the use of AI in the higher education system is currently being implemented in two directions, that is, by the teacher and the student. Special attention should be paid to students. The problems of confidence on the part of the student are mainly related to the introduction of AI technologies in the process of assessing his knowledge, and the concerns that arise are based on the possibilities of resistance to the new form of the educational process and the impact of confidence on the academic performance of the student instead of the usual one. [20]. Therefore, the student should change himself, his main task is to increase the ability to work in complex hybrid conditions where different forms of digitization occur [21].

The role of ChatGPT in the higher education system. New programs such as ChatGPT have created radically different opportunities for student-teacher interactions. If previously technology allowed the automation of routine human labor, creative fields will always remain for people [22], AI-based programs are fundamentally changing these assumptions. The appearance of ChatGPT in November 2022, together with DALE 2 and GMT-3, which were released earlier, made it possible to make a qualitative leap in the relationship between the AI and the employee [14].

The ChatGPT program was initially able to perform tasks that were available only to employees with a high level of education and professional experience. From the point of view of the higher education system the most problematic thing is to use ChatGPT to write anything, including essays, abstracts, term papers and diploma works, dissertations and articles. This affects not only bachelor's degree or master's degree, but any form of education. In some cases, AI and automation perform certain knowledge-based tasks more efficiently than humans. This may reduce the need for some employees. This includes tasks such as data analysis, research and report writing. However, it is worth noting that it could also create new job opportunities for AI and automation staff, particularly in areas related to AI development and implementation.

Before the appearance of such programs as

ChatGPT, DALE 2, GPS-3, it is necessary to have digital skills. In the educational system, it will be useful to learn the skills of using such programs and the ethical rules of communication with AI. Students of modern student and employee retraining programs must have not only technological knowledge and skills, but also simple and elementary knowledge and skills. For the higher education system, the emergence of such programs is not only a danger, but also causes difficulties in operation. The need to change the content of the educational process is related to the fact that AI technologies, in particular, ChatGPT, are in some ways superior to or equal to human beings, and in some ways they are not. In practice, it is desirable to integrate AI technologies into a certain complex for the employee. AI does not replace or replace skilled workers, but serves as an assistant to them in complex processes. According to some scientists, AI has more opportunities to expand human activity than to automate existing tasks [23].

Conclusion

In this work, the main current tasks of the application of AI in institutions of higher education were described, and the ideas of the development of AI, the uncertain social impact of AI were highlighted. AI can significantly change the education system in the future, but there are still many unsolved problems in education. Therefore, the main task of the higher education system is to teach students to understand the logic of AI, its possibilities and limits, and to use it effectively to achieve the goals set by people.

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