DIDACTIC BASIS OF ORGANIZING THE EDUCATIONAL PROCESS BASED ON ARTIFICIAL INTELLIGENCE TECHNOLOGIES

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Abstract. This article discusses the didactic foundations of the integration of artificial intelligence technologies into the educational process, the need to reconsider the purpose, content, methods, tools and results of teaching in the context of the digital transformation of the modern educational paradigm, the didactic principles of organizing education based on artificial intelligence, including flexibility, individualization, interactivity, data-based decision-making and automated analysis of the pedagogical process. It also discusses the role of AI tools in the activities of a teacher, ethical and methodological issues in their application, as well as the need to develop digital pedagogical competencies. The author argues that artificial intelligence is a strategic tool for humanizing the educational process and deepening subject-subject relations between teachers and students.

Keywords: artificial intelligence, educational didactics, flexible education, individualization, digital pedagogy, automated assessment, artificial intelligence in education, pedagogical design.

Introduction. The modern education system is undergoing fundamental changes under the influence of digitalization and the development of innovative technologies. In particular, the rapid development of artificial intelligence technologies requires the formation of new approaches to organizing the educational process. Today, systems based on artificial intelligence allow individualizing the educational process, adapting the content of education, automating the assessment of student knowledge, and increasing the effectiveness of pedagogical activities.

The issue of organizing the educational process based on artificial intelligence technologies is relevant not only as a technological, but also as a didactic problem. Because in this process there is a need to reconsider the goals, content, methods and means of education, and improve them based on modern pedagogical requirements. At the same time, the use of artificial intelligence is an important factor in activating students' independent educational activities, developing critical thinking, and

increasing their motivation for learning. However, the analysis of existing practice shows that the use of artificial intelligence technologies in the educational process is considered more as a technical tool, and its didactic capabilities are not sufficiently scientifically substantiated. In particular, the didactic principles, methods and effective pedagogical conditions for organizing the educational process based on artificial intelligence have not been systematically developed. In this regard, the determination of the didactic foundations of organizing the educational process based on artificial intelligence technologies, revealing their pedagogical capabilities and implementing them in practice determine the relevance of this research. This article scientifically analyzes the role of artificial intelligence technologies in the educational process, didactic principles and ways of effective application.

Relevance of the topic. At the end of the first quarter of the 21st century, the education system is experiencing one of the most rapid and profound technological transformations in the history of mankind. Artificial intelligence technologies are at the center of these changes. Initially introduced in the fields of industrial production, logistics and services, artificial intelligence is now actively entering all levels of the educational process - from preschool education to higher education and lifelong learning. However, the rapid growth of technological capabilities raises a number of fundamental questions in pedagogical theory and practice: how will artificial intelligence change the goals and objectives of the educational process? How will these technologies be combined with traditional didactic principles? What new form will the relationship between the teacher and the student take with the participation of artificial intelligence? This article aims to find answers to these questions, to systematically analyze the didactic foundations of organizing the educational process based on artificial intelligence.

Topic analysis. Educational didactics - the pedagogical theory of the laws, principles, methods and organizational forms of teaching and learning processes - is being radically revised under the influence of artificial intelligence technologies. While the basic principles of traditional didactics, such as scientificity, comprehensibility, relevance, awareness, and activity, retain their significance, the mechanisms for their implementation using artificial intelligence tools are taking on a completely new form. The main didactic task of artificial intelligence in education is the maximum individualization and personalization of teaching. In the traditional classroom system, the teacher does not have the opportunity to simultaneously take into account the level of knowledge, speed of perception, and cognitive styles of dozens of students. Artificial

intelligence algorithms, on the other hand, allow for real-time analysis of each student's educational activity, identification of his or her strengths and weaknesses, construction of a personal learning trajectory, and offering flexible content. This brings the principle of individualization of didactics to a qualitatively new level.

The integration of artificial intelligence technologies into the educational process affects all components of the didactic system - goals, content, methods, tools and results. Educational goals now include not only the formation of knowledge, skills and competencies, but also the development of meta-competences such as critical thinking in a digital environment, working with data, algorithmic literacy, and solving problems in collaboration with artificial intelligence. The content of education is being dynamically rebuilt on the basis of artificial intelligence: static textbooks are being replaced by interactive, multimedia and flexible electronic resources. These resources change in real time depending on the student's previous activity, error analysis and level of mastery. For example, adaptive educational platforms (Knewton, Smart Sparrow, Russian EdTech projects) automatically provide the student with exercises, explanations and additional materials that meet his individual needs. In this process, the principles of sequence and systematicity of didactics are implemented in an optimal sequence for each student using artificial intelligence.

Teaching methods are also undergoing significant changes under the influence of artificial intelligence. Traditional verbal, demonstrative and practical methods are being enriched with methods based on artificial intelligence. These include adaptive teaching methods, intelligent tutoring systems (Intelligent Tutoring Systems), simulation and immersive teaching (based on virtual and augmented reality), modeling problem situations using generative artificial intelligence, interactive communication through chatbots, automated assessment and feedback. Intelligent tutoring systems, such as Cognitive Tutor, developed at Carnegie Mellon University, analyze each step of the student in teaching mathematics and natural sciences, identify the cause of his mistakes and provide tips designed to correct concepts. Such systems provide significant assistance not only to the student, but also to the teacher: the teacher receives a detailed analytical report of each student in the class, clearly sees which topics are difficult for most, which students need additional attention. This serves to implement the principles of awareness and activity in didactics at a new level.

One of the important didactic aspects of organizing education based on artificial intelligence is the transformation of the assessment system. Traditional assessment is often based on the final result, test scores, and cannot fully reflect the student's thinking

process, creative approach, and development dynamics. With the help of artificial intelligence, the possibilities of formative assessment are dramatically expanded. Every student's action, the sequence of solutions, the time spent on the topic, the typology of errors - everything is automatically recorded and analyzed. As a result, the student receives constant, detailed and constructive feedback, and the teacher has the opportunity to correct the learning process in real time. Such an assessment system plays an important role in implementing the principles of consistency and effectiveness of didactics. At the same time, there are a number of problems in assessment based on artificial intelligence: issues such as the objectivity of algorithms, data confidentiality, and the limitations of automated assessment of creative and complex skills remain relevant areas of didactic research.

Of particular didactic importance is how artificial intelligence tools change the role of the teacher in organizing the educational process. Numerous studies and practice show that artificial intelligence does not displace the teacher, but, on the contrary, redistributes and expands his activities. Artificial intelligence takes on repetitive, mechanical tasks (checking homework, preparing documents, answering simple questions, formulating individual exercises). This gives the teacher time and opportunity to interact with students, organize creative and project activities, solve complex pedagogical situations, and focus on the personal development of students. From this perspective, artificial intelligence can serve as a tool for humanizing education and deepening subject-subject relationships between teachers and students. However, this requires new competencies from the teacher - digital pedagogical design, analysis of educational data, critical assessment of artificial intelligence tools, and ethically correct use. Therefore, one of the important tasks of modern didactics is to form the readiness of future and current teachers to work with artificial intelligence.

Ethical and methodological issues also play a special role in developing didactic foundations for the introduction of artificial intelligence technologies into education. First, the issue of data confidentiality and security: the issues of what standards should be used to store large amounts of data (biometric, psychological, cognitive, etc.) collected about students during the educational process, who has the right to use it, and under what conditions this data can be transferred to third parties require clear legal and didactic regulation. Second, the risk of algorithmic bias and discrimination: artificial intelligence systems may unknowingly make wrong decisions based on social, economic, or cultural factors when selecting, evaluating, and making recommendations for educational materials. This contradicts the principles of equality and justice in

education. Third, the problem of excessive trust in artificial intelligence (automation bias): teachers and students may uncritically accept artificial intelligence recommendations and lose their pedagogical and cognitive independence. Therefore, the didactic basis for organizing education based on artificial intelligence should include not only technological, but also a critical pedagogical approach.

After the introduction of generative artificial intelligence (for example, models such as ChatGPT, Gemini, Claude) into the educational process, the didactic system is undergoing another important transformation. These tools allow creating content in various formats such as text, images, audio and video, answering complex questions, modeling problem situations, and conducting dialogical communication with students. This, along with enriching educational methods, requires new didactic approaches to issues such as assessing students' independent work, copyright, and academic integrity. Since traditional homework, abstracts and essays have become tasks that can be completed in a few seconds with the help of generative artificial intelligence, didactics sets the task of designing the educational process in such a way that artificial intelligence is not used as a substitute for the student, but as a tool that enhances his cognitive activity and develops critical thinking. For example, tasks such as asking students to analyze the answer given by generative artificial intelligence, find errors and shortcomings in it, compare answers given by different models, and justify their point of view are becoming important elements of today's didactic design. When developing the didactic foundations for organizing the educational process based on artificial intelligence, it is also necessary to take into account intercultural and contextual factors. Each country, each education system has its own socio-cultural traditions, economic capabilities and educational policies. When introducing artificial intelligence technologies, mechanical copying of models from developed countries without taking this context into account can be ineffective and even harmful. For the Uzbek education system, a didactic model for the development of education based on artificial intelligence should be built in harmony with national educational traditions, language and cultural characteristics, infrastructure capabilities, and the level of digital competencies of teachers. In this model, such areas as artificial intelligence resource centers, open electronic learning platforms, modernization of the teacher training system, and localization of educational content are of great importance. In conclusion, the didactic foundations of organizing the educational process based on artificial intelligence technologies are forming a new pedagogical paradigm consisting of a synthesis of traditional didactics and modern technologies. In this paradigm, such

components as individualization, adaptability, data-based decision-making, automated analysis and assessment, transformation of the role of the teacher, cooperation with generative artificial intelligence, ethical and methodological responsibility occupy a leading position. Artificial intelligence has the potential to make education more effective, inclusive and humane, while preserving it as a complex socio-cultural process that is unthinkable without a teacher, a student and pedagogical relations. However, the realization of this potential depends on the joint responsible and scientifically based actions of the pedagogical community, education management bodies, technological manufacturers and the public. Artificial intelligence will not completely change educational didactics, but on the contrary, it will provide a powerful tool for implementing its basic principles - the principles of human development, the pursuit of knowledge, cooperation and creativity - in new technological conditions.

References:

1. Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education: Promises and implications for teaching and learning. Center for Curriculum Redesign.
2. Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence unleashed: An argument for AI in education. Pearson.
3. Pedro, F., Subosa, M., Rivas, A., & Valverde, P. (2019). Artificial intelligence in education: Challenges and opportunities for sustainable development. UNESCO.
4. VanLehn, K. (2011). The relative effectiveness of human tutoring, intelligent tutoring systems, and other tutoring systems. Educational Psychologist, 46(4), 197–221.
5. Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education–where are the educators? International Journal of Educational Technology in Higher Education, 16(1), 1–27.
6. Abdullayeva, M. U. (2023). Ta’limda sun’iy intellekt texnologiyalari: didaktik imkoniyatlar va istiqbollar. Pedagogika va psixologiyada innovatsiyalar, 5(2), 112–121.
7. Toshpulatov, Sh. Sh. (2024). Raqamli ta’lim muhitida o‘qituvchining kasbiy kompetentligini rivojlantirishning didaktik asoslari. Ta’lim texnologiyalari, 3(1), 45–53.
8. UNESCO. (2021). AI and education: Guidance for policy-makers. UNESCO Publishing.