



**USE OF ARTIFICIAL INTELLIGENCE TOOLS IN DEVELOPING THE
PROFESSIONAL COMPETENCE OF FUTURE TEACHERS IN THE
CONTEXT OF DIGITAL TRANSFORMATION**

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Abstract: This article analyzes the role of artificial intelligence (AI) tools in the formation of professional competence of future teachers in the process of digital transformation. Changes in the modern education system require teachers not only to know their subject, but also to have technological and adaptive skills. The study highlights the potential of AI tools in improving personalized learning, automated assessment, and pedagogical design. It also outlines the methodological foundations for improving the digital literacy of future teachers and preparing them to work in an intellectual educational environment. At the end of the article, proposals are made for integrating AI technologies into the curricula of pedagogical higher education institutions.

Keywords: Digital transformation, artificial intelligence, professional competence, future teacher, personalized education, generative models, educational technologies, digital pedagogy, adaptive teaching, pedagogical skills.

Today, the global education system is undergoing an unprecedented digital transformation, which requires fundamentally new approaches to the quality of teacher training. In the context of the rapid development of the digital economy and society, the professional competence of future teachers is not limited to the acquisition of theoretical knowledge, but also includes the ability to effectively use modern technological achievements, in particular, artificial intelligence tools. Artificial intelligence (AI) is changing the paradigm of education, making it more person-oriented, flexible and interactive. For future teachers, AI is becoming not only an auxiliary tool, but also a strategic partner in managing the educational process, diagnosing student needs and creatively designing educational materials. In the context of digital transformation, the concept of "AI-literacy" (AI-literacy) is introduced into the structure of pedagogical competence, requiring the teacher to effectively



communicate in a digital environment and the ability to intelligently process information.

The use of artificial intelligence tools in modern higher pedagogical education allows future teachers to optimize their workload and focus on live communication with the student. For example, generative AI models (such as ChatGPT, Claude, Gemini) are invaluable in creating lesson plans, creating scenarios that explain complex topics in simple language, and formulating various test questions. The future teacher should learn to develop an individual educational trajectory that matches the level of mastery of each student using these tools. In this process, the level of competence is measured not by the degree to which the teacher is addicted to technology, but by the ability to critically analyze the information provided by AI and filter it in accordance with pedagogical goals. Also, adaptive platforms based on artificial intelligence (such as Khan Academy, Duolingo, Coursera) teach future teachers how to identify students' weak points and provide feedback in real time.

Another important aspect of SI tools in developing the professional competence of future teachers in the context of digital transformation is the ability to work with analytical data (Learning Analytics). Artificial intelligence algorithms can predict students' academic growth by analyzing large amounts of data, assess the psychological climate in the group, and identify disruptions in the learning process. A future teacher must be able to correctly interpret such analytical reports and change his pedagogical strategy based on them. This requires them to form a culture of working with data (data culture). At the same time, SI tools also play an important role in organizing inclusive education: by converting speech to text, converting text to audio format, or creating special interfaces for students with disabilities, the future teacher will gain the competence to create equal educational opportunities for all. However, ethical issues and information security issues in the use of SI tools are also an integral part of pedagogical competence. Future teachers must have a deep understanding of issues such as copyright of content created by SI, confidentiality of data, and algorithmic bias. Digital pedagogy as a discipline covers these aspects and forms a responsible approach to technology in students. The teacher should not only be a "button pusher", but also a person who manages the technological process based on humanistic principles. This, in turn, requires updating the content of pedagogical education, including modules such as "Artificial Intelligence in Education", "Data Ethics" in the curricula.



The process of implementing SI tools in practice in pedagogical higher education institutions should consist of several stages. First, the formation of basic digital skills of students, secondly, teaching the methodology of using SI tools in a specific subject area, and thirdly, developing the skills to independently create intellectual educational materials. For example, a future language teacher can use speech recognition and translation systems to correct students' pronunciation, while a mathematics teacher can use SI models to visualize and simulate complex geometric shapes. Such an approach increases the competitiveness of the future specialist in the labor market and motivates him for constant self-development.

Digital transformation is not just about equipping with technology, but also about changing mindsets. Artificial intelligence cannot replace teachers, but it is inevitable that teachers who can use AI will replace teachers who cannot use this technology. Therefore, in developing the professional competence of future teachers, it is necessary to support their "technological optimism" and at the same time sharpen their critical thinking. AI tools open up new horizons in the implementation of gamification, project-based learning, and flipped classroom methods. The teacher is no longer just a source of knowledge, but also a mentor, facilitator, and guide for students in the digital world.

In the context of digital transformation, the prospects for developing the professional competence of future teachers through artificial intelligence tools are directly related not only to the acquisition of technical skills, but also to a fundamental renewal of pedagogical thinking. In order for artificial intelligence (AI) to become not a competitor to the teacher in the modern educational environment, but rather an intellectual assistant, strategic changes must be made in the higher education system. In this process, new aspects such as "algorithmic understanding" and "technological flexibility" are gaining priority in the professional competence of the future teacher. Managing the educational process with the help of artificial intelligence allows the future teacher to balance the cognitive load of students, determine their individual learning speed, and dynamically change each lesson. In particular, the creation of visual and audio materials in real time using generative neural networks, and the explanation of complex scientific concepts through virtual simulations enrich the teacher's methodological arsenal. At the same time, in the context of digital transformation, one of the most important indicators of a teacher's competence is the ability to filter ready-made solutions provided by SI through the filter of pedagogical ethics and logic. The formation of "prompt-engineering" skills in students, that is, the ability to give



commands to SI systems in a clear and pedagogically purposeful manner, will save time in their future work and improve the quality of education. Future teachers also need to instill in students a culture of academic honesty in the use of SI tools, create an educational environment based on plagiarism-free and independent thinking. This requires the teacher not only technological literacy, but also a high level of moral responsibility. The future teacher must also be ready to eliminate the problem of "digital divide" arising from artificial intelligence, that is, to ensure equal and fair access to technology for all students. As AI tools take over the routine and technical work of teachers (assessment, attendance monitoring, report preparation), teachers have more time to develop students' mental state, emotional intelligence, and social skills. Consequently, in the era of digital transformation, the teaching profession is completely transformed from a "provider of information" to a "personality-forming" and "motivator" function. In order to improve the competence of future teachers, it is important to study international experiences, work on practical projects in AI laboratories, and conduct pedagogical tests in virtual classrooms. In this regard, strengthening cooperation between pedagogical higher education institutions and IT companies, supporting student startup projects, will help create an innovative ecosystem of the education system. The final analysis shows that artificial intelligence is not just a computational power, but a powerful tool that expands human potential, humanizing the content and form of education. The more future teachers master these technologies and combine them with pedagogical skills, the higher the intellectual level of society will be. In the context of digital transformation, a competent teacher is a creative person who is ready for constant changes, able to implement technological innovations and, most importantly, preserve human values in the age of technology. Therefore, in the digital transformation of the education system, the main attention should be paid to improving the personality of the teacher and his intellectual potential, because no perfect technology can replace an experienced and dedicated teacher, but only expands his capabilities to an infinite extent.

In conclusion, it can be said that in the context of digital transformation, artificial intelligence serves as a powerful catalyst for the development of professional competence of future teachers. It intensifies the teaching process, helps to reveal the individual potential of each student, and enhances the creative nature of pedagogical activity. The preparation of future teachers to work with SI tools should be systematic, constantly updated, and inextricably linked with practice. This will not only increase



the quality of education, but also create the basis for increasing the intellectual potential of our country and adequately responding to the global challenges of the digital age. The digital culture and technological skills of teachers are the foundation of a successful education system of tomorrow.

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