European International Journal of Pedagogics

TYPE Original Research
PAGE NO. 25-29
DOI 10.55640/eijp-05-10-06

Issues Of Developing Digital Technologies And Artificial Intelligence In The Process Of Professional Teachers' In-Progress Development

Saidova Dilnoza Maripovna

Senior Lecturer at the Fergana Regional Center for Pedagogical Excellence, Uzbekistan

OPEN ACCESS

SUBMITTED 12 August 2025
ACCEPTED 08 September 2025
PUBLISHED 11 October 2025
VOLUME Vol.05 Issue10 2025

Abstract: Digital technology is a modern form of economic management in which a large corpus of data in digital form—and the processes for handling it—serve as the main factor in production and administration. Applying the resulting outputs in practice enables much greater efficiency compared to traditional management models. Examples include various automated production processes, 3D technologies, cloud technologies, the provision of telemedicine services, producing and delivering goods using smart technologies, and the storage and sale of different types of products. The article discusses identifying trainees' pedagogical and psychological capacities during in-service training and, by developing mechanisms for quality control and assessment, determining the distinctive professional characteristics and requirements for enhancing media competence among general-education school teachers within the professional development process.

Keywords: Digital technology, Artificial intelligence, professional development process, listener, teacher, continuing education, pedagogical activity, professional competence, media competence.

Introduction: At present, there is no single, universally accepted understanding of digital technologies worldwide; nevertheless, many definitions exist. For example, digital technologies can be defined as an economic activity in which data in digital form are regarded as the main factor of production and which, by

using the results of process analysis and the processing of large volumes of data, makes it possible to significantly increase the efficiency of storing, selling, and delivering various types of production, technologies, equipment, goods, and services. As noted above, digital technology is a technology that exists under the conditions of a hybrid world. This definition is also correct and reflects the essence.

METHODOLOGY

The digital (electronic) economy is a type of economy whose distinctive feature is the maximal satisfaction of all participants' needs through the use of information, including personal information. Such an economy can exist thanks to the development of information-communication and financial technologies, as well as the openness of the infrastructure that, in a shared world, ensures full interaction among all subjects and objects of economic activity in the processes of creating, distributing, exchanging, and consuming goods and services. For full interaction, all economic objects and subjects must possess significant digital components.

For example, today the digital components of an automobile (software and sensors), which substantially improve its consumer properties and safety indicators, make up more than half of the car's value. In the future, a significant portion of the value of many goods and services will be determined by their digital component. Such goods are called "smart" items. In the course of digitization, the main characteristics of a product or service should be markedly improved (for instance, a car's safety increases while its operating cost decreases) or new characteristics should appear (such as voice control, or remote control via the Internet or a mobile phone).

Artificial intelligence has already become one of the most important technologies in the world today. Many scenes that we could only see in films and various science-fiction novels at the beginning of the last century are becoming reality in our lives with the advent of artificial intelligence. According to data cited by the UN, given that by 2022 nearly a quarter of the world's gross domestic product was expected to be tied to digital technologies, accelerating and developing work in this area is the most appropriate strategic direction in the current environment. Today, in global practice, countries such as Canada, Singapore, the United Arab Emirates, Finland, Japan, China, Italy, Tunisia, the United Kingdom, the United States, Sweden, Mexico, the European Union, Kenya, Denmark, France, Australia, the Republic of Korea, India, and Germany have announced strategies for the development of artificial intelligence. The rapid and wide application of artificial intelligence technologies in world practice and the corresponding opportunity to use such digital data make it a requirement of the day to ensure high-quality use in our country's life and to create favorable conditions for training qualified personnel in this field.

The term "artificial intelligence" was first proposed in 1956 at the Dortmund Conference by John McCarthy and his colleagues Marvin Lee Minsky, Nathaniel Rochester, and Claude Shannon. John McCarthy is recognized as the author of this term. In the time since, very extensive scientific research has been—and continues to be—conducted, as a result of which the scope of application of artificial intelligence is rapidly expanding. At present, artificial intelligence is being used effectively in healthcare, energy, the mining industry, agriculture, education, improving mechanical engineering, voice assistants, online chat and communication, and software development.

Before defining the concept of artificial intelligence, we need to know what intellect is. Intellect (from Latin intellectus—knowing, understanding, perception, reason) is a person's mental capacity; the ability to accurately reflect and transform life and the environment in consciousness; the capacity to think, study and learn, comprehend the world, and absorb social experience; the ability to reach decisions in solving various problems, act rationally, and foresee events. The components of intellect include perception, memory, reasoning, and mental processes. The development of intellect depends on social factors such as innate talent, brain potential, vigorous activity, and life experience. The level of intellect is determined by both a person's activity and the results of psychological tests.

From the concept of "intellect" considered above, we can conclude that intellect pertains only to humans and is a specific measure of human mental capacity. Through special methods and experiments, psychologists have gained the ability to determine a person's intellectual (mental) level.

The definitions of "artificial intelligence" and "intellect" differ from one another. The main reason is that the characteristics of the brain have not yet been fully studied. The human brain contains countless secrets. However, we do not fully know the modes and principles of the brain's functioning; our basic knowledge about how the brain works is limited to neurons and their activities. To study the brain to the fullest, it is first necessary to understand and explain how it functions. As a result, neurology and, correspondingly, brain-based educational approaches have taken shape. By analyzing the algorithm of the

brain's functioning, one can make a substantial contribution to the development of computers or intelligent machines.

Issues related to the development of artificial intelligence systems have been addressed in studies conducted by Uzbek scholars M. Kamilov, T. Bekmuratov, Sh. Madraximov, and N. Ignatev. Among Russian scholars, M. Akhmetov, A. Bazayeva, L. Bocharova, and A. Lobanov have conducted scientific research on the development of artificial intelligence systems and their application in the field of education.

There is still no single, unanimous, and precise definition of the concept of artificial intelligence. One of the main reasons is the diversity of interpretations offered by scholars working across different fields. Discussions have addressed the emergence, development, and capabilities of AI systems, as well as ways to improve educational quality by applying them in the teaching–learning process. The experiences of developed countries in using AI in education, and issues of adapting those practices to our national education system, have been studied.

John McCarthy—the author of the term "artificial intelligence"—himself offered several definitions. He defined AI as "the science and engineering of making intelligent machines, especially intelligent computer programs." Accordingly, if a computer demonstrates human-like behaviors such as reasoning, problem solving, meaning-making, and generalization—i.e., if it can draw on advanced cognitive abilities—then it can be described as artificial intelligence. Another great scholar, Nils Nilsson, who conducted research on AI and authored numerous academic works in the field, argued that "artificial intelligence is a theory aimed at creating an imitation of natural intelligence." This can also be expressed as a sequence of algorithms that imitate human intelligence.

From the above, we can understand that research in AI often emphasizes that everything in the world operates within a certain algorithm. In this view, consciousness is the result of a highly complex algorithm in mathematical terms. For most contemporary authors on AI, the brain is a structure that performs its functions based on the laws of the external world. This implies that artificial intelligence possesses a rational character. The process of AI's development and transformation runs in parallel with the development of computers—namely, of transistors. However, this should not lead to the conclusion that AI is only related to computer technologies. On the contrary, AI is directly connected to many fields—from medicine, engineering, and industry to psychology—and it is a domain organized in accordance with the needs of all these areas.

Based on analyses of various scientific sources, we can currently classify artificial intelligence, according to its capabilities, into three types. Weak artificial intelligence (or narrow AI). Weak AI is a type of artificial intelligence capable of performing a specific task with intelligence; it is the most widespread and currently existing type. A narrow AI cannot operate outside its domain and constraints, because it is designed for only one clearly defined task—hence the name "narrow" AI. Apple's Siri program is a good example of narrow AI, working within limited, predefined capabilities. Chess-playing systems, self-driving cars, speech recognition, and image recognition can also be cited as examples of narrow AI.

General artificial intelligence. General AI is a type of intelligence that can perform any intellectual task with human-like effectiveness. A general AI is a system that thinks intelligently and like a human. At present there is no such system that embodies general AI and can flawlessly perform any task at a human level. Researchers around the world are now focusing on developing machines endowed with general AI. Work on systems with general AI is still ongoing, and creating such systems requires great effort and time.

Super artificial intelligence. Super AI refers to a level of machine intelligence that surpasses human intellect and can perform any task better than a person with the relevant cognitive abilities. This is considered the outcome of general AI. Some key properties associated with strong AI include the abilities to think, reason, solve puzzles, draw conclusions, plan autonomously, learn, and communicate. Super AI remains a hypothetical concept within artificial intelligence.

The global economy is experiencing an important period marked by sectoral transformation under conditions of a global pandemic, the digitization and mobilization of these processes, and the introduction of artificial intelligence into all areas. One such area is the education system. Many people understand the use of AI in education as "robot teachers," which is somewhat different from reality. We can encounter AI in personalized learning systems, information retrieval, chatbots, specialized educational systems for children, inclusive education systems, systems for monitoring the learning process, and systems for assessing students' knowledge. By using such systems, it is possible not only to increase students' knowledge but also to reduce teachers' workload.

One of the key requirements for organizing modern education with the help of artificial intelligence is to achieve high results in a short time without expending excessive mental and physical effort. Within a given time frame, teachers must convey certain theoretical

knowledge to students and develop in them the skills and competencies relevant to specific activities. Assessing the level of knowledge, skills, and competencies students have acquired requires a high degree of pedagogical mastery from the teacher. Fulfilling this important task necessitates combining traditional teaching methods in general education institutions with advanced pedagogical and information technologies.

Looking at global education efforts in this field: according to Russia's Ministry of Education, schools began piloting "Artificial Intelligence" instructional modules in 2021. By 2024, AI classes are taught in half of all schools within the standard curriculum. In South Korea, AI classes were introduced starting from the second semester of 2021. In the following year, once the topics were incorporated into the school curriculum, second- and third-year middle school students could take an introduction to AI course or lessons in the mathematics of AI. China and the United States are leading in AI research and education. In addition to hosting the world's renowned higher education and research institutions, these countries have fully regulated mechanisms that support innovative activity and provide substantial financial assistance to institutions. As a result, China and the U.S. are attracting a wide range of highly educated specialists from around the world.

In our country, major steps have been taken to develop science, and life itself shows that by using digital technologies in every sector it is possible to achieve significant results in the socio-economic spheres.

RESULTS AND DISCUSSION

As emphasized in President Shavkat Mirziyoyev's Address to Parliament, developing the digital economy is one of the most urgent and priority directions for Uzbekistan in the coming years. As further confirmation of these priority tasks, and proceeding from the objectives set out in the Strategy for Innovative Development of the Republic of Uzbekistan for 2019–2021, a draft Presidential Decree on the "Strategy for the Development of Artificial Intelligence in Uzbekistan for 2021–2022" was put forward for public discussion. The purpose of the Decree is to systematically organize national research and development activities in the field of artificial intelligence and to effectively reform education.

The main task of the Strategy is to rationally mobilize human resources in achieving the goals defined in the 2021–2022 AI Development Strategy, as well as to encourage the creation and use of digital products. In accordance with the "Digital Uzbekistan–2030" strategy, and with the aim of rapidly introducing AI technologies and widely applying them in our country, ensuring access to and high quality of digital data, and creating favorable conditions for training qualified personnel in this field, Presidential Resolution No. PQ-4996 of February 17, 2021, "On measures to create conditions for the rapid introduction of artificial intelligence technologies," was adopted. This resolution aims to develop a regulatory and legal framework that establishes unified requirements, responsibility, security, and transparency in the development and use of AI technologies in the sectors of our country's economy and social sphere, as well as in the system of public administration.

CONCLUSION

A person with a high level of media competence is characterized by the following: a drive (aspiration) to obtain new information; a striving for personal competence in various areas of life and for engagement with the world of media culture; the ability to search for and find scientific materials necessary for study; being in "constant" interaction with media products; possessing the skill to independently create and disseminate media texts in the media sphere (independently or collaboratively); and the ability to be actively engaged in media-related activities (playful, artistic, research, etc.).

Thus, a teacher's self-improvement in media competence is directed toward self-development—spiritually, motivationally, intellectually, and practically—as well as toward self-regulation in volitional and emotional terms. In the course of in-service training, when developing the media competence of general education school teachers, it is necessary to take into account the conduct, behavior, communication, moral and ethical image, social activity, interpersonal relations of the participants, and the influence and involvement of mass media in professional development.

In summary, during the process of professional development, in the specific aspects of cultivating media competence in teachers, it is necessary—based on the requirements of an innovative educational environment—to organize and manage the educational process with attention to the following: when forming qualification requirements in specialized subjects across all categories of teachers, it is essential to focus on the content and essence of the competence-based approach.

REFERENCES

1. Jo'rayev R va boshqalar. Pedagog kadrlar malakasini uzluksiz oshirish mexanizmini takomillashtirish. O'quv-metodik qo'llanma. –T.: Adabiyot uchqunlari, 2022, –160 b.

2. Ibragimov A.A, Fayzullayeva G.Sh. Malaka oshirish kurslarida amaliy mashg'ulotlarni tashkil qilish va o'tkazish. Uslubiy qo'llanma. – Samarqand.: SVXTXQTMOHM, 2023. –104 b.

3. Innovatsion ta'lim texnologiyalari va pedagogik kompetentlik" moduli bo'yicha o'quv-metodik majmua.- Toshkent, 2023. –B. 42.

4. Kubey, R. (1997). Media Education: Portraits of an Evolving Field. In: Kubey, R. (Ed.) Media Literacy in the Information Age. New Brunswick & London: Transaction Publishers, p.2.