THEORETICAL FOUNDATIONS FOR IMPROVING STUDENT COMPETENCE THROUGH DIGITAL TECHNOLOGY IN EDUCATIONAL PROCESSES

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Abstract. The article examines the current problems of modern education and reveals philosophical ideas about the role of digital technologies in the educational system. It talks about the informatization of the modern education system, its role in improving the quality and opportunities of education, the problems and threats that arise as a result of the creation of a digital educational environment covering the world, and the solutions aimed at their elimination.

Keywords: digital technology, digitization of education, risks of digital educational environment, ICT, modernization of education, information security of students, information technologies

Introduction. To date, education and education in the educational system of our country has become one of the pressing issues. Because it is no longer a secret for anyone that quality education plays an important role in saving the world in which we live from various problems. In the current period, when the speed of obtaining and using information is very large, it is impossible, in our opinion, to improve the quality of education without involving digital technologies in the educational system. With this in mind, our country is in the higher education system"... the tasks of ensuring a solid integration of modern information and communication technologies and educational technologies, creating additional conditions for the continuous development of professional skills of pedagogical personnel in this regard; individualization of educational processes on the basis of digital technologies, development of distance education services, extensive introduction of webinar, online, blended learning, flipped classroom technologies into practice are set as priority . In the age of digitization, the development of society is characterized by the strong influence on it of computer technologies that make up the world information space, ensure the spread of information flows in society. The impact of digitization on the development prospects of society, educators and the future generation is much deeper and wider. This process requires a philosophical and methodological analysis and a revision of the strategy for the development of a digital educational environment around the world. What is "digital education" if we first focus on the essence of digital education? - "Digital education is the innovative use of digital tools and technologies in the teaching and training process, as well as technologies in education." Digital technology is one modern form of business, in which a large set of data in digital form and the process of their processing serve as the main factor in production and management. The history of the creation of digital technologies goes back centuries. In the diaries of the terrible Italian Leonardo da Vinci (1452 - 1519), a number of drawings were already found in our time, which became a sketch of an assembly computer on wheels capable of adding 13-digit decimal numbers. Specialists from the famous American company IBM remade the machine into metal and were convinced of the complete consistency of the scientist's idea. Its assembly machine can be considered an original event in the history of digital computing.

From 1641 to 1642, nineteen - year-old Blaise Pascal (1623-1662), later a less well-known French scientist, creates a working additive machine ("Pascaline"). Initially, he built it for one purpose - to help his father in the calculations carried out in collecting taxes. Over the next four years, he created more advanced models of the machine. They are six - and eight-bit, based on gear wheels, and are capable of adding and removing decimal numbers. About 50 types of cars were created, B. Pascal received a royal privilege to produce them, but the "Pascalines" did not have practical use, although much has been said and written about them (mainly in France).

In 1673, the great European, German scientist Wilhelm Gottfried Leibniz (1646 - 1716), creates a counting machine (an arithmetic device according to Leibniz) for adding and multiplying twelve-digit decimal numbers. To the gear wheels, it added a stepped roller, which allows reproduction and division. "... My machine allows you to instantly multiply and divide into huge numbers, without resorting to sequential addition and subtraction," wrote V. Leibniz to one of his friends.

In digital electronic computing machines (computers), which appeared more than two centuries later, a device that performs arithmetic operations (the same as Leibniz's "arithmetic device") was called arithmetic. Later, when a series of logical actions were added, they began to call it arithmetic-logical. It has become the main device of modern computers.

Thus, two geniuses of the 17th century marked the first milestones in the history of the development of digital computing.

V. Leibniz's services are not limited only to the creation of an "arithmetic device". From his student years to the end of his life, he was engaged in the study of the features of the binary number system, which later became the main one in the creation of computers. He gave it a certain mystical meaning and believed that on its basis it was possible to explain the phenomena of the world and create a universal language for its use in all disciplines, including philosophy. In 1697, V. The medal image that Leibniz Drew was preserved, explaining the relationship between the binary and decimal systems of computation. In 1799, in France, Joseph Marie Jacquard (1752-1834) invented a loom, which used perforators to create patterns on fabrics. The initial information necessary for this was recorded in the form of a punch in the appropriate places of the cardboard. This is how the first primitive device for storing and entering program data (in this case, controlling the weaving process) appeared.

In 1795, it was here that the mathematician Gaspard Prony (1755 - 1839), entrusted by the French government with the work related to the transition to the metric system of measurement, developed the technological scheme for the first time in the world of calculations that propose the division of labor of mathematicians into three components. The first group of several highly qualified mathematicians identified (or developed) the numerical computational methods necessary to solve the problem of addition, removal, multiplication, division, which allows calculations to be reduced to arithmetic operations. The assignment of a sequence of arithmetic operations and the identification of the initial data necessary for their implementation ("programming") was carried out by the second-order, the composition of mathematicians, the extended part. There was no need to attract highly qualified specialists to carry out a "program" consisting of a sequence of arithmetic operations. This, the most time-consuming part of the work, is entrusted to the third and most numerous group of calculators. This division of Labor made it possible to significantly accelerate the receipt of results and increase their reliability. But the main thing is that it gave impetus to the further process of automation, the most laborious (but at the

same time the simplest!) The third part of the calculations is the transition to the creation of digital computing devices with programmed control of the sequence of arithmetic operations.

This final stage in the evolution of digital computing devices (mechanical type) was carried out by the English scientist Charles Babridge (1791 - 1871). An excellent mathematician who had experience in creating technical tools to facilitate the calculation process (Babby's difference machine for tabulating polynomials from 1812 to 1822), who perfectly mastered the numerical methods of experienced calculations, he immediately wrote that G. Saw an opportunity in the computing technology recommended by Proni. The Analytical Engine (as Babbage called it), the project of which he developed in 1836-1848, was a mechanical prototype of computers that appeared a century later. It was supposed to have five basic devices, as in the case of a computer: arithmetic, memory, control, input, output devices.

1801: Joseph Marie Jacquard, a French merchant, invented a loom that uses perfocartes for automatic weaving of fabrics.

1821: English mathematician Charles Babbidge came up with a steam counting machine that could calculate number tables. Funded by the British government, this so-called "Difference Machine" project failed due to a lack of technology.

1848: Ada Lovelace, an English mathematician and daughter of the poet Lord Byron, writes the world's first computer program. Lovelace writes the first program, translating an article on the Babbage analytical engine from French into English.

1853: Swedish inventor Per Georg Shoyts and his son Edward developed the world's first printed calculator. This machine was the first to "calculate the differences in the table and print the results".

1890: Herman Hollerith is developing a perfocarta system to calculate the results of the 1890 U.S. Census. The machine saves the government several years of bills.

1931: Vannevar Bush invents and builds the differential analyzer, the first large-scale general-purpose automatic mechanical analog computer.

1936: British scientist and mathematician Alan Turing "on computable numbers...", which presents the principle of a universal machine later called a turing machine.

1937: professor of physics and mathematics John Vincent Atanasov applied for a grant to create the first electric computer.

1939: David Packard and Bill Hewlett founded Hewlett Packard in Palo Alto, California. The couple choose the name of their new company by coin toss, and Hewlett-Packard's first headquarters is located in Packard garage.

1941: German inventor and engineer Konrad Zuse is finishing his Z3 machine, the world's number one computer.

1941: Atanasov and his graduate student Clifford Berry are designing the first digital electronic computer in the United States called the Atanasov-Berry computer.

1945: John Mochley and J. Presper Ekert develops and creates an electronic digital integrator and calculator (ENIAC). The machine is the first "automatic, universal, electronic, decimal, digital computing machine".

1947: William Shockley, John Bardeen and Walter Brattain from Bell Laboratories invented the transistor. They learn how to make a power switch from solid materials and without vacuum.

1949: a Cambridge University team is developing an automatic electronic delay storage calculator (EDSAC), "the first practical computer with a memory storage program".

1954: John Backus and his IBM team of programmers published a document describing the newly created Fortran programming language. 1953: Grace Hopper is developing the first computer language known as COBOL.

1958: Jack Kilby and Robert Noyce introduce an integrated circuit known as a computer chip.

1968: Douglas Engelbart presented a modern computer prototype at the fall joint computer conference in San Francisco. His presentation, titled" Human Intelligence Development Research Center", includes a live performance.

In 1973, the first personal computer was created in France by Nruohg Trohg Ti . The originally created mascur personal computer was adopted as an electronic toy. This computer was perfected in 1977 by the American firm Apple Computer, headed by Steve Jobs, and began to be released publicly, implementing a large set of programs. Since then, the computer has settled in our lives and has become the most modern means of information processing.

And as the main stages of development of digital technologies, we can cite the following:

- Stage 1: implementation of computerization and automation of control processes (including ARM, ERP, EDI, SRM, CAD, ASU, asutp, etc. The development of telecommunication systems, including the implementation of wired and wireless, optical communication;

- Stage 2: implementation of On-line platforms (search engines, electronic trading spaces, distance education, social networks). The introduction of cloud and virtual technologies into life;

- Stage 3: predictive analytics of Big Data, Internet of items, robotics, large-scale use of additive technologies (including 3D printers), artificial intelligence (including the machine-assisted learning process).

As the basic principles of digital technology, we can distinguish:

1. ability to use global resources without intermediaries;

2. the possibility of renting resources in different ways;

3. be able to use the volunteerism (volunteerism) model (open source model;

4. in conicity to be able to trade through the global ecosystem.

Among the reserves necessary for digital technologies, we can include:

* availability of computational-communicative infrastructure;

* performance of digital technologies of various types;

* presence of fast Internet;

* availability of trained human resources in the field of digital technology:

* large-scale use of business models of various types;

* availability of intellectual on-line production systems:

* financial sufficiency for digital technologies:

* opportunities for organizing crowdsourcing and crowdfunding processes.

Information and communication technologies are technologies that allow you to search, process and master information from various sources, including the internet. It is the provision of information in electronic form, its processing and storage, the use of various programs on the computer itself. At the initial stage of Education, a modern student must have the initial skills of a personal computer user, the teacher must actively use modern interactive technologies, develop the child's ability to work with the computing and information systems necessary in everyday life.

In the process of using ICT in classes, the students 'self-ability is formed, it is worth processing information, which in turn forms the students' ability to make optimal decisions or offer solution options in a difficult situation, develops the ability to carry out experimental and research activities. The use of this technology opens up new methodological opportunities for teaching for the teacher and increases the efficiency and quality of conducting classes, teaching, allows the formation of a culture of mental work, develops the attention, creative activity and discipline of students.

Today, new technical tools have appeared with huge educational resources that radically affect the organization of the educational process, increasing its capabilities. New technical, information, printing, audiovisual tools become an integral part of the educational process, introducing into it specific features in the form of an integral part of methods and tools. This quality already allows us to talk about specific pedagogical technologies based on the use of modern information and computer tools. The use of Information Technology in classes has shown that the attitude of students to the topic is changing, they are not afraid to take the initiative, express their opinion in solving the proposed tasks, they strive to master software materials at a higher level to what extent. Information technology teaching is a new methodological system that allows you to consider a student not as an object, but as a subject of training, a teacher as a "subject of study", a computer as a "teaching tool". Today, a science teacher should be able to prepare a lesson using ICT. This lesson should be visual, informative, interactive, save students and teachers time, allow the student to work at their own pace and allow the teacher to work differentially, however, given the opportunity to quickly control and evaluate the student's work. In order to effectively use ICT in the college learning process, you do not need software tools that require special long-term training, you can use electronic resources aimed at a wide range of consumers. The main thing is that they can help: prepare and implement classes for teachers and systematize methodological materials;

Information technology as one of the components of a holistic education system not only opens up the possibility of variability in educational activities, its individualization and differentiation, but also makes it possible to organize the interaction of all subjects of education in a new way. One of the main tasks of the modern general education is the formation of information competence: mastering information technology, understanding their application, weaknesses and strengths, the ability to critically evaluate information disseminated through various tools and advertising. Thus, the introduction of new technologies into the educational process has become a socially defined necessity. Information technology, which is considered as one of the components-the integrated system of the educational system not only facilitates access to information, opens up the possibilities of variability of educational activities, its in individualization and differentiation, but also allows you to create a new organization of the interaction of all educational subjects, an educational system in which the student becomes an active and equal participant in educational activities. The introduction of new information technologies into the educational process makes it possible to activate the educational process, implement ideas for the development of Education, increase the speed of classes and increase the volume of independent work of students. Humanization of education involves the value attitude of the student to various personal manifestations. Knowledge does not function as a goal, but as a way to develop personality. The richest opportunities for this providing modern Information Technology (ICT). The introduction of ICT into the work of the teacher helps to improve the quality of Education, increase the

possibility of Education, ensure the development of a person focused on the information space. The use of Information Technology in the educational process makes it possible not only to modernize it, increase efficiency, stimulate students, but also to differentiate the process, taking into account the individual characteristics of each student. The relevance of this topic is due to the fact that computers are increasingly entering all areas of education, the skillful use of them creates a constant interest in this topic among students, helps to learn with enthusiasm to achieve high results in educational activities. Contributing to the achievement of the main goal of modernization of education through the use of ICT, improving the quality of education, ensuring harmony, the development of a person who is focused on the information and communication capabilities of modern technologies in the information space during communication and has an information culture, as well as providing existing experience and determining its effectiveness is one of.

Materials and methods used. Today, there is a wide passion for the introduction of digital technologies in modern education and the integration of the educational sphere. The digitization of education is becoming a pillar of educational policy worldwide, with increasing optimism that such an approach can bring a wide range of potential benefits not only from the social but also from the economic side and for society as a whole. Unfortunately, despite these opinions, digital inequalities remain in education - these inequalities affect the most vulnerable sections of society, including those who are in a socio-economic critical situation or who live in rural areas, outside the city. Being sure that the ideas advanced in education on the basis of digital technologies are reliable, being aware of World policies and actions are essential for monitoring progress. Teaching has become much easier today thanks to the available digital educational tools. Digital education differs significantly from teaching and its traditional form. Examples include online curricula and virtual platforms that serve as a link between teachers and students. Consequently, such a form of Education has many advantages.

The results obtained and their analysis. Basic digital education and digital tools the advantages are access to resources, simplified communication and the ability to maintain constant communication. Let's dwell on the advantages of digital education:

1. Through digital education, teachers can cover more students. The coverage offered by digital platforms deserves praise. Former teachers it was limited by geographical boundaries. There are no geographical restrictions on digital education. An integrative approach to education gives teachers and teachers the opportunity to expand their capabilities and increase their knowledge base.

2. Educational institutions with digital education literally come to the place where you are. No matter where the teacher or student is, online educational apps and platforms will help them stay in touch. E-learning resources, learning materials and the like Are the benefits of digital learning.

3. One of the possibilities of digital education is that students study subjects at a distance can choose and their options are not limited. Accommodation, travel and problems such as others do not arise. Good internet connection for this and need a mobile device. The student and teacher can be at different poles from each other, but thanks to the available digital tools, they can stay in touch and conduct classes. As mentioned above, compared to traditional teaching methods the creation of infrastructure does not require large costs. Many students due to the limited budget, they do not have access to quality education. There are different types of digital education resources, such as: electronic textbooks, there are electronic resources, online training programs,

in addition to mobile applications for teachers and students. Government agencies, educational institutions increasingly digitization.

Conclusions. In conclusion, digital education is a great innovative idea every day, thanks to the emergence of startups and the development of technology, it is conquering new heights. The process of moving from traditional classes to digital classes has accelerated due to the pandemic. The pandemic has become a catalyst for this process, and most teachers have switched to digital teaching methods. The form of Education has also changed due to countless digital apps that make life easier, such as animation, quizzes, online training programs and the like. While traditional education has its advantages, digital education has an advantage over it due to its many advantages. In order to make the most of digital education, it is necessary to use technological tools responsibly and wisely. The more dominant side of improving the digital education system, the more threatening there are. Students should understand the importance of not using other online spaces so that they are not distracted from their studies. The introduction of new technologies into the educational process allows, along with traditional educational materials, the use of modern electronic means to support the educational process. However, in addition to the advantages, there are threats that arise as a result of the organization of a single digital educational environment and cannot be ignored. When implementing this system, it is necessary to carefully assess the consequences of digitization of education and adopt a strategy of optimal protection against the threats it poses.

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ПРОБЛЕМЫ ПРОФЕССИОНАЛЬНОГО ПЕДАГОГИЧЕСКОГО И ПСИХОЛОГИЧЕСКОГО ОБРАЗОВАНИЯ (pp. 12-14).