

# Digitization of Education as a Condition for the Development of Modern Society

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## Summary

The article clarifies the definition and components of the ICT competence of future teachers, justifies the introduction of a motivational-value component. ICT competence of future teachers has a four-component structure: motivational-value, general-use, general pedagogical, subject-pedagogical components. The levels (reproductive, productive, creative), criteria and indicators of the formation of ICT-competence of students of a pedagogical college are determined, the content of these levels (reproductive, productive, creative) is disclosed, respectively.

## Key words:

*information technology, communication technologies, education system, educational process, ICT competence.*

## 1. Introduction

Today, the basic types of activities of specialists of any professional activities are implemented on the basis of continuous improvement of the general culture of the individual. Many studies note that within any areas of training "must form and develop key competencies that are multifunctional, supra-subject and multidimensional" [7]. Mastering such competencies allows you to solve a variety of problems in everyday, professional, social life [3]. One of these competencies today are ICT competencies.

Informatization, and today a new stage of development - digitalization of education, is an objective law in the development of modern society. Future teachers need to use information, communication and digital technologies in their professional activities, therefore, one of the primary tasks of the vocational education system is the formation of the ICT competence of the future specialist.

In general, ICT competence is understood as "a set of knowledge, skills and experience in the field of using ICT in education, manifested through a set of ICT competencies" [2-6, 9, 13].

For our research, it is of interest that ICT competence includes individual activity abilities and qualities, which determine the following opportunities and skills: independently search, collect, analyze, present, transmit information; design and simulate objects and processes (including your own individual activities); to model and design the work of the team; make decisions, creatively and effectively solve problems in the process of productive activity; navigate the organizational environment based on modern ICT; responsibly implement their plans, using modern ICT in a qualified manner; use in your professional activity modern ICT.

Of particular interest is the definition of the concept "ICT competence of the future teacher". Under by this term we understand "not only the totality of knowledge, skills, and abilities formed in the process of teaching computer science and modern ICT, but also the personal and activity characteristics of a specialist in the field education, highly prepared for the motivated use of the entire set and variety of computer tools and technologies in their professional activities" [13].

Today, ICT competence as a component of professional pedagogical competence is justified in the UNESCO standard "UNESCO ICT Competency Framework for Teachers. VERSION 3" (ICT CFT), developed in 2018 [2]. This document provides a comprehensive set of competencies that educators need to integrate into their professional practice in order to help students achieve curriculum goals.

In the UNESCO document, the term "competence" describes the functionality of the teacher, and "competence" refers to the ability of teachers to perform the relevant functions. The structure of the ICT competence of teachers reflects all aspects of the teacher's professional activity (understanding the role of ICT in education, curriculum and assessment, teaching practices, the use of digital skills, organization and management of the educational process, professional development). It

reflects six modules, including ICT competencies, in accordance with these aspects and three levels to the informatization of education ("Obtaining knowledge", "Mastering knowledge", "Production of knowledge"). We have taken these recommendations into account when determining the structure of the ICT competence of the future teacher of a preschool educational organization.

## 2. Theoretical Consideration

ICT CFT [2] also recommends using modern education trends in relevant aspects and at all three levels of informatization (Acquisition of knowledge, Mastering knowledge, Creation of knowledge):

open educational resources (OER) are any educational resources (for example, textbooks, streaming video, multimedia applications, etc.) that are available for use by educators and students, without having to pay for use or licensing fees (free);

social networks are websites or applications that provide online communication with people in networks united by a common interest or activity (Facebook, Twitter, Instagram, etc.).

Social networks can be used to improve pedagogical communication, facilitate the organization of interactive learning, strengthen the community of students and teachers;

mobile technologies (smartphones, tablets, etc.) - devices that offer educators and learners a more flexible approach to learning anytime, anywhere, and linking formal and non-formal learning;

The Internet of Things (IoT) is a network of computing devices embedded in everyday objects other than computers and smartphones, allowing them to send and receive data over the Internet.

artificial intelligence (AI). There is no generally accepted definitions of AI. Generally, the term "artificial intelligence" is used when a machine, especially computers, mimics human thinking or behavior that humans associate with human intelligence, such as like teaching, speaking and problem solving. Artificial intelligence applications include expert systems, speech recognition and natural language processing, machine vision and imaging technologies.

currently in education, AI is used in the form of: custom content through adaptive learning programs and software, tracking and monitoring diagnostics, automation assessments, AI tutors;

virtual reality (VR) and augmented reality (AR).

Virtual reality (VR) is a computer simulation of the environment with which a person can interact. The person is immersed in this simulated environment and is able to manipulate objects or perform a number of actions. Augmented reality (AR) is a representation of the real an environment whose elements are expanded with the help

of computer images; they overlap the real-time physical environment. AR changes the person's current perception of the real environment, while VR replaces the real environment with a simulated one;

big data Because people and devices are everything more connected to the network, society is generating digital data at an extraordinary rate unprecedented in human history.

Social computing, networked devices, e-business transactions, mobile computing, sensors and environmental scanners generate billions of events per second, many of which are stored for later analysis or can be analyzed as a real-time data stream;

programming (coding) is what allows you to create computer programs, applications and websites. Code is a set of instructions that computers can understand. A computer program is a sequence of instructions that a computer can interpret and execute, and is in fact a process automation tool. All computer programs are based on algorithms that determine how a task should be performed; ethics and privacy protection (cybersecurity). For ICT innovation to be developed and used in the service of education and humanity, a value-based approach to the use of ICTs in education is required. There is a need to educate educators and learners on data protection and skills to enable them to better control their personal data.

The foregoing allows us to conclude that in the aspect of the conducted research it is necessary to clarify the concept of "ICT competence of a student of a teacher training college." Under the ICT competence of a student of a teacher training college, we will understand it integral personality and activity quality, manifested in the ability, based on knowledge, skills and experience acquired in the preparation process, to solve professional problems with the help of ICT and on the basis of digital literacy; in the readiness of the motivated use of ICT, taking into account the specifics of the field of professional activity.

Thus, the components of ICT competence, most fully reflect the essence and content of this concept. In this regard, let us single out an additional component in the structure of ICT competence - a motivational-value component.

Based on reviewed dissertation research, Professional Teacher Standard, ICT CFT, we we offer a four-component structure of ICT competence:

motivational-value, general-use, general pedagogical, subject-pedagogical components.

Of interest for our research, I present the UNESCO Recommendations "Structure of ICT Competence for Teachers" (version 3) [2], which describes three successive levels of mastering by teachers of the skills of using ICT for pedagogical purposes (ie, the formation of ICT competence). The first level is "Gaining knowledge": teachers acquire knowledge about the use of technology and receive basic ICT competencies. Upon completion of this level, teachers should receive understanding the

potential benefits of using ICTs in education, and opportunities for planning ICT investments in line with policy and priority areas. At this level, educators master the use of technology for continuous self-study and further training [14-15].

The second level is "Mastering knowledge": teachers acquire ICT competencies that will allow them in the future to create a favorable educational environment focused on students and development teamwork skills. This level makes it possible to apply "political directives taking into account the real situation in educational institutions, to develop plans in the field of information technology to support the relevant resources of the educational organization and predict future needs" [5]. Educators can continue their education by joining the national and international teaching community. The third level is "Knowledge Creation": teachers acquire ICT competencies that help them model best practices and create a learning environment that would contribute to the formation of fundamentally new knowledge in students necessary for the development of more harmonious, perfect and prosperous societies [16-20].

Thus, the above analysis made it possible to clarify the concept and structure of ICT competence of a student of a pedagogical college; justify the introduction of a motivational-value component and propose a four-component structure of ICT competence of a student of a pedagogical college (motivational-value, general-use, general pedagogical, subject-pedagogical components); to determine the levels (reproductive, productive, creative), criteria and indicators of the levels of formation of ICT competence of students.

## Conclusions

Thus, the digitalization of education is changing the teaching profession, and the requirements for the digital qualifications of a teacher are increasing.

Today, ICT competence, including digital literacy, should be an element of all forms of teacher education and professional preparation during the life cycle. Digital literacy is the ability of an individual to use digital technologies, communications or networks to find, evaluate, use and create information. Digital literacy also includes the ability of an individual to: understand and use information in several formats from a wide range of sources; effectively perform tasks in a digital environment.

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