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TEACHERS' DIGITAL LITERACY AS A KEY REQUIREMENT OF THE «NEW UKRAINIAN SCHOOL»

Abstract. The article demonstrates that information and digital competence is recognized as one of the key competencies outlined in recommendations from various European institutions. Based on a study of domestic and foreign scientific sources, as well as state regulatory and legal documents, an analysis of the information and digital competence of modern teachers was conducted. It has been established that the definition of a teacher's information and digital competence is based on a general understanding of competence and is considered as a dynamic combination of knowledge, skills, abilities, ways of thinking, views, values, and other personal qualities in the field of digital technologies, and determines the teacher's ability to successfully socialize and conduct professional and/or educational activities using such technologies. The article shows that the developed information and digital competence will allow teachers to use digital technologies for professional interaction with colleagues, students, their parents, and their personal professional development, ensuring student-centered learning strategies, focused on students, their assessment, and improving the effectiveness of feedback in the learning process. It has been established that the quality of young people's preparation for life in a rapidly developing digital society depends on the level of digital literacy of teachers and their effective use of digital technologies in educational activities.

Keywords: NUS, knowledge, skills, abilities, attitudes, digital education, digital educational environment, information and digital competence, safety in the digital environment.

Problem setting. Ukraine needs a systemic reform of education, which should be the subject of public consensus and understanding that education is one of the main levers of civilizational progress and economic development of the country. «The key request is to focus on people. All changes are for people and about people. The focus is on technology and innovation so that Ukrainians have the best opportunities and the state has strong human capital» said Minister Oksen Lisovyi. Therefore, institutions in all existing segments of the education system must focus on a competency-based approach as a vector towards European education standards, where the focus is on creative individuals who are able to make effective decisions quickly and take responsibility for them. The reform of domestic education based on a competency-based approach is reflected in the draft educational standard «New Ukrainian School» [12] and continues in the National Strategy for the Development of Education and Science until 2030 [17]. The conceptual framework of the documents includes competencies that can ensure personal fulfillment and lifelong success. One of these competencies is information and digital literacy, which is identified as one of the key

competencies outlined in the recommendations on digital competencies from European institutions. Teachers with a new mindset, innovative approaches, and forms of work oriented toward the digital society will be able to ensure its formation in general secondary education students. That is why the formation and development of teachers' information and digital competencies is an important component of their professional training.

Analysis of basic research and publications. Scientists have been working on the problem of developing teachers' information and digital competence. Along with the regulatory and legal justification for updating the conceptual framework of education, particularly in the direction of digitalization, they carried out a scientific analysis and interpretationof a whole range of definitions. Researchers explain the categories of «digital literacy», «digital competence», «digital culture», and related concepts, defining their structure and specific features associated with the rapid development of modern information and communication technologies. Thus, in the article by L. Gavrilova and Y. Topolnik, an analysis of modern educational definitions is carried out: digital culture, digital literacy, and digital competence, and it is proven that these concepts go beyond the digital field and touch on a wide range of educational, cultural, and socio-humanitarian aspects. According to the authors, the main semantic accents of digital culture are associated with the emergence of new specific information and virtual forms of culture and cultural communication, while digital literacy indicates, first of all, the perfect use of electronic means and the formation of skills and abilities to work with «digital». The definition of digital competence is based on a general understanding of competence and consists of relevant knowledge, skills, experience, values, and attitudes that can be holistically implemented in practice [7].

V. Bykov and O. Pinchuk demonstrate the demand for digital competence in the context of strategic tasks for the development of the digital environment and reforming Ukraine's education system in line with modern requirements. Scientists define digital competence as a necessary condition for the digital transformation of educational and scientific activities, and outline the problems of forming the competences of participants in the educational process [2]. I. Grebenik [8], A. Kleba [10], N. Morze [4;5], S. Tolochko [18], and others pay considerable attention in their research to the development of digital competence among educators, describing the digital competences of teaching staff, university lecturers, and students.

The digital competence of teachers is described quite extensively in the reports and manuals of the international project «Modernization of Higher Education in Pedagogy Using Innovative Teaching Tools» (MoPED) of the EU Erasmus+ KA2 program – Capacity Building in Higher Education, No. 586098-EPP-1-2017-1-UA-EPPKA2-CBHE-JP [5]. Thus, a group of researchers in the field of digital technologies in education (N. Morze (group leader), O.Bazelyuk, I. Vorotnikova, N. Dementievskaya, O. Zakhar, T. Naieva) developed the «Description of Digital Competence of a Teacher» [4] in accordance with Order No. 38 of the Ministry of

Education and Science of Ukraine dated January 15, 2019. The description of the digital competence of teaching staff was developed in accordance with the Concept of Development of Teacher Education, European framework documents on digital competence – DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use, Digital Competence Framework for Educators (DigCompEdu).

The authors defined the requirements for the structure and levels of digital competence that are necessary for the successful professional activity of a teacher in the context of the digitalization of education. The developers of the standard have defined the components of digital competence for teaching staff as a list of various knowledge, skills, abilities, and value orientations in the field of digital technologies, which are divided into five areas: 1) teachers in a digital society; 2) professional development; 3) use and analysis of digital resources; 4) teaching and assessing students; 5) development of students' digital competence [5].

Researchers O. Ovcharuk, O. Hrytsenchuk, I. Ivanyuk, O. Kravchyna, I. Malytska, and N. Soroko analyzed the experience of individual European Union countries in training and upgrading teachers' qualifications in the field of digital technologies. They identified key areas of educational reform aimed at improving the digital competence of teachers, described the place of ICT teacher training programs in postgraduate education programs in European countries, and characterized the European strategy for integrating ICT into the educational process [13].

A. Kleby's scientific research shows that the information and digital competence of future teachers in higher education institutions is an important component of their professional competence and is considered as the ability to systematically, logically, and systematically apply information and communication technologies. The researcher scientifically substantiated the importance of the «webquest» technology in the formation of information and digital competence of future teachers [10, p. 26].

In her article, I. Grebenik substantiates the need to develop the digital competence of general secondary education institution administrators and reveals its essence. The key components of digital competence are highlighted, including: a high level of functional ICT literacy, the ability to use digital technologies effectively and appropriately in the educational process and professional activities, as well as an awareness of the role of digital tools as the basis of a new educational paradigm focused on the development of the student's personality in the information society [8]. The study outlines the principles of developing digital competence among managers of general secondary education institutions, namely: systematicity (a holistic, systematic approach to developing the components of digital competence); continuity (continuous improvement of the components of digital competence); activity (own transformative activity); self-development (the need to apply acquired experience, professional self-development throughout life) [8, p. 22].

I. Grebenik reveals the meaning of the concept of digital literacy of a general secondary education institution manager and defines its main functions: cognitive, developmental, evaluative, adaptive [8, p. 20-21]. The author pays particular attention to the role of postgraduate teacher training as the most effective system for developing the digital skills of secondary school administrators.

In her scientific research, O. Zakhar examines the components of the information and communication competence of computer science teachers. The researcher proposes criteria for assessing the level of information and communication competence of computer science teachers based on the ICT competence, and proposed tools for tracking the level of ICT competence of computer science teachers [9]. The practical value of this study lies in the fact that the author has managed to identify the reasons for the insufficient preparation of computer science teachers and propose effective ways to develop their ICT competence.

The purpose of the article is to clarify the meaning of the concept of «information and digital competence» of teachers and to identify its main components.

Research methods: comparative analysis and synthesis of scientific and scientific-methodological literature, Internet sources, and regulatory and legal acts on the research topic, which made it possible to identify the characteristics and main components of teachers' information and digital competence; comparison of different views of Ukrainian and European scientists on the subject; generalization of the results of theoretical research.

Presentation of the basic material. Information and digital literacy is recognized as one of the key competencies of a successful person in the 21st century. It is a basic skill without which it is impossible to imagine effective work in any field of knowledge. It is information and digital literacy, as a key category, that plays a central role in the professional qualities of a modern teacher today. At the same time, the need to possess information and digital literacy is now a personal professional requirement and a challenge in the context of the fourth industrial revolution. This is highlighted in such important documents as the «Description of the Digital Competence of a Teacher» [4], and the Education Strategy of Ukraine 2030 [17], the conceptual reference «Framework of Digital Competence for Teachers and Scientific and Pedagogical Workers» [11], Corporate Standard for Digital Competence of University Teachers [6], which lay the foundation for a strategic action plan for the development of digital competencies and are aimed at implementing Ukraine's «digital strategy» initiatives.

The draft conceptual and reference «Framework for Digital Competence of Pedagogical and Scientific-Pedagogical Workers» was created by Ukrainian experts in accordance with the Order of the Cabinet of Ministers of Ukraine dated March 3, 2021, No. 167-r, «On the Approval of the Concept for the Development of Digital Competencies of Ukrainian Citizens and the Approval of the Action Plan for its Implementation» [16]. The development was carried out taking into account the

provisions of the Concept for the Development of Pedagogical Education, the Law of Ukraine «On Education» and within the framework of the «Action. Digital Education» program implemented by the Ministry of Digital Transformation of Ukraine.

It is based on the European conceptual reference model of the Digital Competence Framework for EU citizens «The Digital Competence Framework for Citizens with eight proficiency levels and examples of use» (DigComp 2.1), the Framework for EU educators «The Digital Competence Framework for Educators» (DigCompEdu), and the adapted Digital Competence Framework for Ukrainian Citizens (DigComp UA).

The recommendations of international and European institutions in the field of digital competences were also taken into account during the development process, as well as the results of research conducted by Ukrainian experts within the framework of the Erasmus+ international projects «Framework Structure of Digital Competences for Ukrainian Teachers and Other Citizens» (dComFra) [16], «Modernization of Higher Education in Pedagogy Using Innovative Teaching Tools» (MoPED). Therefore, today the Framework is a sought-after and timely document in the field of educational standards [5].

The Framework project was reviewed by the expert community of the EU4Digital Program's eSkills network [16] in Ukraine with the participation of representatives of the Expert Advisory Committee on Digital Technologies in Education at the Ministry of Education and Science of Ukraine, as well as specialists from the Digital Skills Committee of the Ukrainian National Digital Coalition «Digital Transformation Coalition». Taking into account current challenges, the document was adapted to the national context, including the cultural, educational, and economic characteristics of Ukraine.

Currently, the conceptual reference «Framework of Digital Competence for Teachers and Researchers» describes 22 competencies grouped into five areas corresponding to professional activities and professional functional duties, regardless of profession, specialty, age, gender, and/or other factors, namely:

– digital literacy (computer literacy; information and media literacy; safety in the digital environment);

– professional engagement (professional communication in the digital environment, netiquette; professional interaction and collaboration in the digital environment; reflection and assessment of one's own digital competence; professional development in the digital environment; research activities; academic integrity);

– digital educational resources (searching for and selecting digital educational resources; creating, modifying, and adapting digital resources; managing digital resources for storage, organization, and distribution; protecting digital educational resources; open licenses and copyright);

– educational activities (use of digital technologies in the learning/teaching process; management of the educational process in a digital environment; organization

of active learning in a digital environment; digital inclusion and accessibility; digital assessment and analysis of educational achievements of learners);

– promoting the formation and development of information and digital competence among learners (forming and developing information and media literacy among pupils/students; forming and developing learners' competence in creating digital content; teaching pupils/students effective communication, interaction, and cooperation in the digital environment; the formation of digital culture, digital security, and cyber hygiene among pupils/students; promoting the formation of problem-solving competence in the digital environment among pupils/students) [11, p. 19].

The conceptual and reference framework for the digital competence of teachers and scientific and pedagogical workers also provides an indicative description of the levels of digital competence,and a list of criteria for determining the level of competence of pedagogical and scientific-pedagogical workers:

– basic level: beginner in the use of digital technologies (level A.1); user in the use of digital technologies (level A.2);

– sufficient level: integrator with in-depth use of digital technologies (level B.1);

– high level: creator-experimenter with the use of digital technologies (level B.2);

– expert level: leader-innovator with the use of digital technologies (level C) [11, p. 25-26]

According to the conceptual reference model, the formed information and digital competence will allow the teacher not only to use digital technologies for professional interaction with colleagues, students, their parents, their own professional development, ensuring student-oriented learning strategies, their assessment, and improving the effectiveness of feedback in the learning process, but also involves acquiring the skills and experience to develop students' information and digital competence.

At the same time, despite the large number of scientific developments devoted to the problem under study, there is still no generally accepted term for the interpretation of information and digital competence in both domestic and foreign science. Analysis of scientific works has revealed certain discrepancies in the interpretation of the concept we are studying. In particular, S. Tolochko interprets the concept of «teacher's information and digital competence» as a set of knowledge, skills, abilities, and various indicators of the use of digital technologies for communication, collaboration, and professional development[18].

S. Prokhorova interprets the information and digital competence of a teacher as the ability to use ICT effectively and efficiently in their teaching activities and for their professional development. The components of digital competence also include additional knowledge, skills, abilities, and attitudes, among which are technical skills in working with ICT, the ability to apply these resources in the educational process,

and the ability to plan, analyze, and manage the educational process using information and communication technologies [15].

An analysis of scientific works by foreign researchers on information and digital competence also reveals certain discrepancies in the interpretation of the definition. In particular, A. Ferrari interprets digital competence as a set of knowledge, skills, and abilities that enable the effective use of information and communication technologies. At the same time, the author emphasizes that this competence is based not only on technical aspects, but also on personal values, the ability to cooperate, communicate effectively, and manage information with critical thinking, reflection, creativity, and ethical standards [3].

K. Ala-Mutka reveals the meaning of digital competence in greater depth, defining its key components:

– instrumental knowledge and skills, covering technical proficiency with digital devices, as well as the ability to use media environments safely;

– advanced knowledge and skills, which include effective digital communication, information management, online learning, and active participation in digital processes;

– attitudes that involve understanding and accepting intercultural interaction, critically evaluating the quality of information, being open to digital creativity and learning using digital technologies, as well as being aware of cybersecurity issues and adhering to ethical standards in the digital environment [1].

In order to eliminate contradictions, let us turn to normative documents for an interpretation of the concept under study. According to the authors of the New Ukrainian School educational standard, information and digital competence involves the confident and critical use of information and communication technologies (ICT) to create, search for, process, and exchange information at work, in public spaces, and in private communication [12, p. 13].

Conceptual and reference framework for digital competence of teaching and research staff The concept of «digital competence» is interpreted as a dynamic combination of knowledge, skills, abilities, ways of thinking, attitudes, values, and other personal characteristics in the field of digital technologies, and defines an individual's ability to successfully socialize and carry out professional and/or educational activities using such technologies [11, p. 13].

As we can see, in the scientific sources and regulatory documents we have analyzed, the basis of teachers' digital competence is formed by ways of thinking, basic knowledge, and skills in using digital technologies for learning, work, and leisure in a digital society, namely:

– understanding the processes of the digital educational environment, digital educational resources, digital assessment, etc.;

– understanding how digital technologies can facilitate professional communication, collaboration, creativity development, and innovation implementation;

– be aware of the functional capabilities, limitations, risks, and consequences of using digital technologies;

– be able to critically assess the accuracy and reliability of information sources, be aware of the impact of information on consciousness, decision-making, and personal development.

Conclusions and further research perspectives. In the context of the fourth industrial revolution, education must systematically and consistently develop the digital competence of future employees in various sectors of the economy. Teachers, along with developing skills and deepening knowledge (which are important means of personal development), have a crucial mission – to be guides in the digital society. That is why they need to understand the impact of digital technologies on the environment and society, implement innovative changes and digital strategies for active learning, taking into account the goals, conditions, and needs of students, and effectively interact with digital tools and technologies for continuous professional development, advanced training, and lifelong learning.

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ІНФОРМАЦІЙНО-ЦИФРОВА КОМПЕТЕНТНІСТЬ УЧИТЕЛІВ ЯК КЛЮЧОВА ВИМОГА «НОВОЇ УКРАЇНСЬКОЇ ШКОЛИ»

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Анотація. З'ясовано, що інформаційно-цифрова компетентність визнана однією із ключових, серед груп компетентностей, окреслених у рекомендаціях у сфері цифрових компетентностей від різних європейських інституцій. На основі вивчення вітчизняних та зарубіжних наукових джерел й державних нормативно-правових документів здійснено аналіз інформаційно-цифрової компетентності сучасного учителя. Встановлено, що визначення інформаційно-цифрової компетентності учителя виходить із загального розуміння компетентності й розглядається, як динамічна комбінація знань, умінь, навичок, способів мислення, поглядів, цінностей, інших особистих якостей у сфері цифрових технологій, і визначає здатність учителя успішно соціалізуватись, провадити професійну та/або навчальну діяльність із використанням таких технологій. Доведено, що сформована інформаційно-цифрова компетентність дозволить педагогу використовувати засоби цифрових технологій для професійної взаємодії з колегами, учнями, їхніми батьками, власного особистісного професійного розвитку, забезпечення стратегій індивідуалізації навчання, орієнтованих на учнів, їх оцінювання, підвищення ефективності зворотного зв'язку у процесі навчання. Встановлено, що від рівня цифрової грамотності педагога, ефективності використання ним цифрових технологій в освітній діяльності залежить якість підготовки молоді до існування у цифровому суспільстві що стрімко розвивається.

Ключові слова: НУШ, знання, уміння, навички, ставлення, цифрова освіта, цифрове освітнє середовище, інформаційно-цифрова компетентність, безпека в цифровому середовищі.

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