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XVII МЕЖДУНАРОДНА НАУЧНА КОНФЕРЕНЦИЯ

**„ДИГИТАЛИЗАЦИЯТА НА НАУКАТА,
ОБРАЗОВАНИЕТО, БИЗНЕСА И ТУРИЗМА“**



**YEARBOOK
OF
VARNA UNIVERSITY OF MANAGEMENT**

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**„DIGITALISATION OF THE SCIENCE,
EDUCATION, BUSINESS AND TOURISM“**

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DIGITAL CULTURE AND DIGITAL COMPETENCE IN A CREATIVE EDUCATIONAL ENVIRONMENT

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ЦИФРОВАЯ КУЛЬТУРА И ЦИФРОВАЯ КОМПЕТЕНТНОСТЬ В УСЛОВИЯХ ТВОРЧЕСКОЙ СРЕДЫ ОБРАЗОВАНИЯ

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Abstract. Based on the analysis of Ukrainian legal documents as well as Ukrainian and foreign scientific publications, the authors prove that the concepts of digital culture and digital competence go beyond the technological or digital industry and are about a wide range of educational, cultural, socio-humanitarian and other aspects of life.

Digital creative environment is defined as a learning environment that provides targeted use of tools, technologies and information resources that enable individuals' creative self-expression through the use of digital technology, integration of information and communication technologies, intelligent systems, human sensitivity and contextual experience of scientific and educational activities.

Digital culture implies the perfect use of electronic means, developed skills and abilities to work with "the 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 fully implemented in practice.

Key words: *digital creative environment; digital competence; digital culture; knowledge; skills; habits; attitudes*

Аннотация. На основе анализа украинских правовых документов, а также украинских и зарубежных научных публикаций авторы доказывают, что концепции цифровой культуры и цифровой компетенции выходят за рамки технологической или цифровой индустрии и охватывают широкий спектр образовательных, культурных, социально-гуманитарных аспектов, и другие аспекты жизни.

Цифровая творческая среда определяется как среда обучения, которая обеспечивает целевое использование инструментов, технологий и информационных ресурсов, которые позволяют людям творчески самовыражаться за счет использования цифровых технологий, интеграции информационных и коммуникационных технологий, интеллектуальных систем, восприимчивости человека и контекстуального опыта. научно-образовательной

деятельности.

Цифровая культура предполагает безупречное использование электронных средств, развитые навыки и умения работать с «цифровым». Определение цифровой компетенции основано на общем понимании компетенции и состоит из соответствующих знаний, навыков, опыта, ценностей и отношений, которые могут быть полностью реализованы на практике.

Ключевые слова: *цифровая творческая среда; цифровая компетенция; цифровая культура; знание; навыки и умения; привычки; отношения*

Introduction. The development of information technology, which has taken place over the past 50 years, has formed a fundamentally new world, in which the use of external information resources is a natural consequence of globalization. This is manifested primarily in the fact that devices that are connected to the Internet are used in all areas of human life. Computers and the Internet have made their way into all sectors of the economy and created the preconditions for the formation and development of the digital economy. The use of digital technologies in various sectors of the economy have significantly changed people's lifestyles, working conditions and doing business. This requires significant changes in the goals, content, forms, methods, tools and organization of education.

When analyzing certain educational problems related to the use of computer technology, Ukrainian and foreign scientists use the concepts of digital competence and digital culture, which, among others, have become indicators of professional maturity of modern teachers.

There is a growing need for creation, study, and use of innovative educational systems to educate future teachers-researchers in the digital creative environment of free economic education. Among the criteria for assessing the quality of educational and scientific activities of universities, a significant place is given to digital culture of researchers. This makes scientists focus their attention on studying future professionals' digital culture in the digital creative environment as a strategic resource for sustainable intellectual development of Ukraine.

Analysis of recent research and publications. Digital technologies, services and systems promote growth and job creation in all sectors of the economy, from traditional enterprises to newest high-tech industries. The digital economy today is an area with untapped potential in both Ukraine and the European Union. Based on this, one of the Europe's top priorities is to create a Single Digital Market in the coming years. It is estimated that the implementation of this initiative can bring the EU economy, which produces 14 trillion euro's worth of product, 415 billion euros annually, as well as create hundreds of thousands of new jobs [1].

Given Ukraine's signing of the European Union Association Agreement, the main goals of the development of the information society in Ukraine are gradually being aligned with the standards of European development. Among them is the Digital Agenda for Europe initiative, which identifies the priorities for building an information society in line with the European Economic Development Strategy «Europe 2020: A strategy for smart, sustainable and inclusive growth». With the aim of integration into the global processes of digitalization, in 2016, the Cabinet of Ministers of Ukraine presented the project «The Digital Agenda for Ukraine 2020» [15]. Among the priorities and initiatives of digitalization of Ukraine is the spread of digital education. This document widely uses the concepts of digital competence and digital intelligence, as well as emphasizes the importance of the formation of cross-platform digital competence, when students study different subjects by means of digital technologies [15, 22]

Foreign authors (D. Belshaw, B. Hirsch, G. Creeber, R. Martin, L. Manovich, I. Stommel Stommel) and Ukrainian scientists (V. Bykov, D. Galkin, M. Leshchenko, P. Matyushko, O. Ovcharuk, V. Rebrina) explain the categories of digital competence and digital culture as well as other related concepts, describe their structures and features associated with the rapid development of modern information and communication technologies.

Ukrainian scientist A. Babkin, O. Goloborodko, A. Dobrynin, M. Zgurovsky, A. Petrenko, N. Kraus, K. Kraus, P. Kupriyansky, A. Raikov, V. Sukhomlin, L. Ustinov and others have studied structural changes in and complex modernization of education and science to make them innovative and digital. Besides, they have explored the problems of adaptation of Ukrainian education to the challenges posed by the global space.

Aim. To analyze the modern understanding of the concepts of digital culture, digital competence, and digital intelligence and outline their uses in a digital creative environment.

Discussion and results. «The Digital Agenda of Ukraine 2020» defines the principles of Ukraine's development in the digital space and the fundamentals of a digital economy. It includes 10 areas to develop: public safety, health, e-government, e-democracy, ecology, smart cities, e-payments, social sphere, e-customs, and e-commerce [15].

Digital technologies offer new opportunities for the improvement of the quality of teaching, learning, research, and management. Investment in students and staff's digital skills brings individual and organizational benefits, such as quality education in flexible and innovative forms to meet students' expectations and needs, better employment opportunities thanks to understanding of the principles of the digital economy, as well as greater organizations' returns on investment in learning technologies.

The study of educational concepts of digital competence, digital culture, and digital intelligence are based on a number of European and Ukrainian government documents («Recommendations of the European Parliament and the Council of Europe on the Formation of Key Competencies of Lifelong Learning» (2006), «Information Society Development Strategy in Ukraine» (2013), and the Law of Ukraine «On Higher Education» (2014), etc.).

The concept of digital culture was introduced into scientific use by T. O'Reilly in 2004 with the emergence of Web 2.0 technology, the second generation of Internet services with a new approach to the Web-resources organization, implementation and support.

The Analytical Note of the Humanitarian Policy Department of the National Institute for Strategic Studies states that digital culture is the basis for modern world culture, an integral part of all social processes, including educational; the phenomenon of digital culture is significant because it indicates that information and virtual socialization is the dominant form of socialization [13]. The document testifies to the radical changes in the understanding of culture itself, which takes new forms (cinematic and literary cyberpunk, video sculpture, digital installation, techno- and electronic music, virtual museum and theater, soft art, etc.) and demonstrates fundamental changes in human cognition and creativity.

In modern science (L. Baeva, O. Gook, V. Kryvosheev) there is a tendency to interpret digital culture as a technological phenomenon, because all objects of this culture operate using digital devices that use binary-coded information, which becomes this culture's system-forming factor (from the technological point of view). In this case, the concept of digital culture coincides with the definition of electronic culture (e-culture) as a

set of results of people's IT-technologies-based creativity and communication and the formation of a single information space. Since all modern information and communication means (computers, analog and digital video cameras, mobile phones, photo-, video- and TV-cameras, players, and tablets, etc.) are electronic devices, electronic culture also includes the phenomena of computer-, multimedia-, and cyberculture as its varieties [3].

K. Litvinov in his DigitalBlog emphasizes other aspects of digital culture. He understands it as a system of rules of human behavior, which people follow when they use information and communication technologies [6]. Digital culture includes the following components:

- critical thinking regarding the quantity and quality of perceived information; it includes search (choosing reliable information sources), interpretation (preferring facts to opinions), research (in-depth analysis of information to draw conclusions), and evaluation (assessment of the information message from various aspects);
- digital literacy, i.e. the ability to use modern IT and software, especially in professional activities;
- IT volunteering, i.e. the use of ICT not only for their own needs, but also to improve the world around them;
- rational consumption of information;
- competent use of social media (social media literacy);
- network literacy, which implies knowledge of the basics of network security and net-etiquette standards.
- green use of information technology («green IT»), participation in solving environmental problems caused by information progress [15].

Today, scientists believe that digital culture depends on different types of skills, such as:

- skills of interacting with computers and other devices
- (hardware skills), which allow going online or creating digital artifacts;
- skills of interacting with software, universal skills of work with digital technologies (meta skills), in particular for designing and/or developing digital online or offline environment [6, 14].

The concept of teacher digital culture in the scientific and methodological literature is used mainly as a synonym for digital literacy. Thus, V. Rebrina defines this phenomenon as a teacher's ability to work with modern digital technology and modern information and communication technologies and distinguishes its following components: computer literacy, information literacy (information culture), multimedia literacy, and computer communication literacy [12].

The concept of digital competence compared to the above definitions of digital culture is much broader and more general. It includes skills in the information and communication (digital) environment as a leading feature of digital literacy, as well as new practices of digital culture with relevant values and personal experience (a socio-cultural component).

In 2016, the European Commission updated the digital competence framework to DigComp 2.0 [10], and in 2017 to DigComp 2.1 [4], which is currently one of the latest European strategic documents developed by the European community. The Digital Competence Framework 2.0 is based on UNESCO documents and includes the basic user, independent user, and professional user levels [8, 9].

These documents present educational standards as a system of competencies that correspond to certain areas and determine the knowledge, skills, and attitudes needed in these areas, as well as examples of using the skills to achieve different goals, and the levels

of skill development.

Based on the analysis and comparison of various practices and documents, in 2017, DigComp developed the European standards for teachers' digital competence (DigCompEdu) [7].

DigCompEdu is an evidence-based database that helps manage policy and can be directly adjusted to the regional and national tools and training programs. In addition, it provides a common language and approach that will facilitate dialogue and experience sharing across borders. The DigCompEdu targets teachers at all levels of education, from early childhood to adult education, including general and vocational education, special needs education and non-formal learning contexts. It aims to provide a common guide for developers of digital competence models, i.e. EU member-states, regional governments, institutions and stakeholders [7].

The components of digital competence should ensure free mastery of skills of information processing and work with digital objects, which accordingly promote digital competence, etc. The acquisition of the following information will contribute to the development of the relevant digital knowledge:

- data storage and sharing services (Google disk, clouds, @ gmail.com, etc.);
- classes and sites (Google, ZohoSites, ZohoWiki);
- hosting platforms (Amazon Elastic Compute Cloud, Google App Engine, Microsoft Azure);
- integrated software packages containing text and spreadsheet editors, multimedia presentation creating and editing services (Google documents, OfficeOnline, ZohoOfficeSuite);
- multimedia presentation creating and editing services (Google presentations, PowerPointOnline, PowToon, Prezi.com, Slides, SlideRocket, Slideshark, ZohoShow);
- graphics services (raster editors: Google images, PixlrEditor, SumoPaint; vector editors: Janvas, SVG-edit; 3D editors: AutodeskTinkercard, AutoCAD 360; blockchain services: Lucidchart, Draw.io);
- cloud-oriented operating systems (GoogleChromeOS, JoliCloud);
- virtual desktop services (Cloudo, xOS, ZimDesk, ZeroPC).
- text editors (Google documents, WordOnline, ZohoWriter).
- online calendars for collaboration (Google Calendar, Outlook, ZohoCalendar);
- instant messaging services (4talk, Pibox, Telegram);
- webinar organization services (TeachBase, ZohoMeeting);
- distance course services (TeachBase).

The rapid development of digital technologies and the knowledge society require teachers to constantly develop their digital competencies.

DigComp 2.0 determines the main components of digital competence in five areas (Table 1).

Table 1. The main components of digital competence according to DigComp 2.0

#	Digital competence components	Functions of digital competence components
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1	Information and digital data	To formulate information needs, find and receive digital data, information, and content; to assess the relevance of the source to its content; to store, manage, and organize digital data, information, and content
2	Communication and cooperation	To interact, communicate and collaborate through digital technologies, while recognizing the diversity of cultures and generations; to participate in social life through public and private digital services and civil community
3	Digital content creation	To create and edit digital content; to improve and integrate information and content into existing knowledge while understanding how to apply copyright and licenses; to know how to give clear instructions to computer systems
4	Security	To protect devices, content, personal data, and privacy in digital environments; to protect physical and mental health, as well as to be aware of digital technologies for social well-being and social integration; to pay attention to the impact of digital technologies on the environment
5	Problem solving	To identify needs and problems, as well as to solve conceptual problems in digital environments; to use digital tools to implement innovation processes; to be aware of digital evolution

The change in the legal basis for digital competence standards published by UNESCO and adopted by the European standards for digital competences, the development of relevant standards in Ukraine, and enabling teachers to choose refresher courses allow determining new approaches to building individual ways of teachers' digital competence development.

Conclusions and prospects for further research. Despite the great scope of scientific achievements, there is a need for further research and development of a road map of digitalization of education in Ukraine in order to form a digital society whose members should have developed digital skills and higher education in new specialties. In addition, digital education should be institutionalized, i.e. it should follow certain standards, norms, and rules. This stage is quite time consuming and requires the involvement of a large number of leading scientists, researchers, and practitioners.

As a conclusion, it can be noted that digital education is an accelerator of socio-economic life, which can rapidly increase the country's GDP. However, in this process should not see halts and protraction. Pragmatism of organizational and institutional action together with social responsibility should be the basis for institutional support of digital competencies in the field of higher education.

Institutionalization of the modern economic order in the direction of digital competencies formation and development should consider different aspects of the evolution of today's social values. It should be based on quality education and use creative innovators.

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