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PROFESSIONAL TRAINING OF FUTURE SPECIALISTS IN THE FIELD OF TECHNOLOGY AND DESIGN USING DIGITAL TECHNOLOGIES

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Abstract. The article substantiates the relevance of the problem of using digital technologies in the professional training of future specialists in the field of technology and design. A theoretical analysis of scientific sources for understanding the concepts of “professional training”, “digitalization”, “digital technologies” was carried out. It was found that the technological education of young people plays an important role in the formation of critical and technical thinking, the ability to change the environment by means of modern technologies and design, gaining experience in the step-by-step creation of useful and aesthetic products; development of skills to use traditional and modern technologies; the ability to entrepreneurship and innovative actions, the formation of a work culture, the desire to improve the process and results of design and technological activity, as well as the determination of the sphere of future professional activity, which depends on the well-being and economic power of the state. It was concluded that digital technologies are an effective means of professional training of future specialists in the field of technology and design, which ensure the achievement of an atmosphere of cooperation, understanding and benevolence, contribute to the formation of critical and technical thinking skills and abilities, the development of creative potential and self-realization, the achievement of new educational results, adequate to the requirements of the digital society. At the same time, digital technologies make it possible to make the process of professional training of future specialists in the field of technology and design mobile, differentiated and individual based on the implementation of innovative approaches, including the use of Google services, E-manuals, multimedia presentations, the use of web quests, “cases”, project method, etc. The digital transformation of Ukrainian education strengthens the motivation of future specialists for self-education and self-development, contributes to the achievement of new educational results adequate to the requirements of a digital society. Digital technologies are effective means that enable individuals to be prepared for active life in society and allow for the editing, expansion and improvement of social experience.

Keywords: professional training, digitalization, technology, design, digital technologies, specialists in the field of technology and design, institution of higher education.

1. INTRODUCTION

Digitization of society has become one of the main trends in the labor market. Digital technologies provide new opportunities in various areas of life, including business, medicine, education, art, etc. During the pandemic caused by the spread of the coronavirus and the wartime transition of higher education institutions to distance and blended learning. More attention is being paid to the digitization of higher education, which leads to technological changes that contribute to improving the accessibility,

quality and efficiency of education, as well as to the preparation of students of higher education for requirements of modern society.

Digital technology and design are becoming increasingly integrated into a variety of fields, including web development, graphic design, user interfaces, virtual reality. Therefore, professionals in the field of technology and design must be prepared to use the latest tools and developments. As experience shows, technological education of young people plays an important role in the development of critical and technical thinking, the formation of the ability to use modern design technologies, gaining experience in creating useful and aesthetic products in partnership; development of skills to use traditional and modern technologies; ability to entrepreneurship and innovative activity, formation of work culture; striving to improve the process and results of project-technological activity, as well as determining the sphere of future professional activity, which depends on the well-being and economic power of the state.

2. ANALYSIS AND DISCUSSION

Currently, higher education institutions should pay great attention to training of specialists who are competent, responsible, competitive in the labor market, possess professional competence for effective work in the chosen specialty at the level of world standards, are socially and professionally mobile, capable of constant professional growth and self-improvement. In the findings, academician N. Nychkalo claims that professional education is focused on the personal growth and creative self-realization of every citizen of Ukraine, the formation of a generation that will learn throughout life, develop the values of civil society and contribute to the strengthening of the Ukrainian state and its integration into the European and world space (Nychkalo, 2014).

One of the main challenges in the direction of digitalization of the educational process in institutions of higher education is a clear definition of the essence of the concept of "digitalization" and the definition of key landmarks in education. In 2016, the Digital Competence (DigComp 2.0) framework defined 5 blocks of competences, including: information literacy, ability to evaluate, use and manage data; interact with digital technologies; create, change and improve digital etiquette; solve problems with computer hardware and software; be aware of the need for new digital skills (Digital Agenda of Ukraine - 2020).

The modern digital space sets new requirements for the professional training of future specialists in the field of technology and design, among which are the assimilation of information and communication technologies, the means of presenting educational information, the development of the ability to provide artistic and creative, project and technological training, the ability to use multimedia technologies and digital tools in future professional activities. We are impressed by the reasoning of N. Morze that when designing the digital activity of students of higher education, the teacher contributes to the solution of complex problems, development of critical thinking, emotional intelligence, creativity, ability to cooperate, conduct negotiations, and cognitive flexibility (Morze, Barna, & Vember, 2013, pp. 45–57).

Since there is no single approach to defining the essence of the term "digital technologies", we interpret it as the processing and transmission of information using coded symbols used in computer technology. A. Chernenko defines digital technologies as information based on various devices and gadgets and comes in a variety of formats. The researcher interprets the term "digital technologies" as a combination of computer technologies, electronic technologies, information, information and telecommunication technologies (Chernenko, 2019, p. 193–200).

Scientific findings prove that the professional training of future specialists in the field of technology and design in the conditions of the digital transformation of education should begin with the formation of the values of future professional activity, the presence of motivation, personal and socio-cultural factors, the formation of a personal, scientific and pedagogical worldview, awareness of one's own professional uniqueness, possession a set of scientific and innovative methods. The willingness to

transfer experience to others, as well as the ability to integrate scientific knowledge, comprehensive and complex scientific design, are important. The digital competencies that future technology and design specialists should master include the following: the ability to work with application programs, digital devices, digital information (search, transformation, transfer and inclusion in new information), communication in a digital environment, creation of unique digital products and other. However, according to T. Blyznyuk, the universal application of digital devices, requires from educators themselves to develop their own digital competence as they have insufficient digital skills (Blyznyuk, 2018). With the aim of forming basis of teachers' and future specialists' digital competence, numerous training programs are held on the base of the Centre of Innovative education technologies "PNU EcoSystem" at Vasyl Stefanyk Precarpathian National University (<https://nauka.pnu.edu.ua/en/center-innovative-educational-technologies-pnu-eco-system/>). The academic staff of the university are active participants of international projects and share gained knowledge on best foreign practices of implementing distance learning with their colleagues. A perfect example of such exchange is realization of the tasks of the project of the EU Erasmus + KA2 – "Modernization of Pedagogical Higher Education by Innovative Teaching Instruments (MoPED)", No 586098-EPP-1-2017-1-UA-EPPKA2-CBHE-JP (Blyznyuk, Budnyk, & Kachak, 2021).

We believe that the presence of modern equipment, computer classes, software, free WI-FI zones and electronic educational resources is a necessary attribute of the innovative educational environment of higher education institutions. University repositories, electronic scientific journals, electronic textbooks, etc., are useful for those seeking education. There is a whole range of digital tools that allow you to create information products to support the educational process. Ukrainian scientists and practitioners are actively introducing many of them into the education process (Blyznyuk, Budnyk, & Kachak, 2021, pp. 93-94). The following web services are the most effective, simple, operational and free for creating multimedia and interactive content for communication, collaboration, visualization and gamification of learning: Zoom, Google Classroom, Class Dojo, etc. The Google Classroom web service performs the role of methodical, software, technical, information and organizational environment. The active use of Google Classroom, which has existed since 2014, began precisely at the time when educational institutions on the national and global scale were forced to stop face-to-face teaching. The statistics regarding the use of Google Classroom during the pandemic caused by the spread of the coronavirus infection are quite convincing. According to BBC News, as of March 30, 2020, the number of downloads was more than 50 million, but until March 2000, Google Classroom was not even among the top 100 educational applications (Bykov, & Shyshkina, 2016, pp. 30-52).

In the context of distance education, LearningApps.org has gained popularity as a service that supports the process of learning and teaching with the help of small interactive modules. These modules can be used directly as learning resources or as independent work. The goal is to create a public library of independent modules that can be reused and modified. Modules (called exercises) are not complete lessons or assignments, as they are not part of a specific scenario or program, but can be used in appropriate educational scenarios. It is a tool for testing and consolidating knowledge and developing critical thinking. It is easy to use and can be used to create interactive tasks of varying complexity, such as quizzes, crosswords, puzzles and games.

MindMeister is a unique tool for group work and reflection. This is a service that allows you to create mind maps, which is used, in particular, in educational processes that provide feedback through summative and formative assessment. Virtual whiteboards are used to quickly collect data from students. For example, Padlet is a service that allows all participants in the educational process to work together on a web wall where they can attach files, photos, links to websites, etc. This wall can be managed by several participants, and access to viewing and editing is available to everyone (Tsyunyak, 2021).

The official portal of the Ministry of Education and Science of Ukraine (<https://mon.gov.ua/ua>) and the website "Osvita.UA" (<https://osvita.ua/>) are useful for future specialists in the field of technology

and design, which are used for the purpose of obtaining normative reference documents; familiarization with new textbooks, books, scientific and methodical literature. In working with digital technologies, the role of the teacher as a tutor and coordinator of the learning process is especially growing, who can manage the educational process taking into account the individual capabilities of each student with the help of electronic textbooks, which are a set of educational, control, modeling and other programs that reflect the main scientific content of the educational disciplines.

In our opinion, digital technologies make it possible to make the process of professional training of future specialists in the field of technology and design mobile, differentiated and individual based on the implementation of innovative approaches, including the use of Google services, E-manuals, multimedia presentations, the use of web quests, “cases” , project method, etc. The use of digital technologies increases professional opportunities, especially since future specialists must have such professional knowledge, skills and experience that in their totality demonstrate the free use of digital technologies. In addition, the use of these technologies is a way of organizing the activities of students of higher education for the purpose of active, conscious assimilation of skills, increasing motivation, development of communication skills, and formation of professional knowledge. Digital technologies in today’s world are not only a tool, but an environment that opens up new opportunities: learning at any convenient time, continuous education, the opportunity to design individual educational routes, from consumers of electronic resources to their creators.

3. CONCLUSION

Thus, from the above, we can conclude that in the education system, digitalization contributes to the flexibility of the educational process, reflects the modern paradigm of social development, ensures the formation of competitive professionals who learn to quickly adapt to conditions that change unpredictably and rapidly. In addition, the digital transformation of Ukrainian education will motivate future specialists in the field of technology and design to self-education and self-development and will contribute to the achievement of new educational results that meet the requirements of a digital society. Digital technology is an effective means that helps prepare a person for active roles in society, enabling to edit, expand and improve social experience, making it more meaningful. The use of modern digital technologies guarantees an atmosphere of cooperation, mutual understanding and benevolence and creates conditions for the most effective formation of critical thinking skills, development of creative potential and self-realization of the individual.

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У статті обґрунтовано актуальність проблеми застосування цифрових технологій у професійній підготовці майбутніх фахівців у галузі технологій та дизайну. Здійснено теоретичний аналіз наукових джерел з осмислення понять “професійна підготовка”, “цифровізація”, “цифрові технології”. З’ясовано, що технологічна освіта молоді відіграє важливу роль у формуванні критичного та технічного мислення, спроможності до зміни навколишнього середовища засобами сучасних технологій і дизайну, набуття досвіду поетапного створення корисних і естетичних виробів; виробленні навичок застосовувати традиційні та сучасні технології; здатності до підприємливості та інноваційної діяльності, формуванні культури праці, прагненні удосконалювати процес і результати проектно-технологічної діяльності, а також визначенні сфери майбутньої професійної діяльності, від якої залежить добробут та економічна могутність держави. Зроблено висновки, що цифрові технології є ефективним засобом професійної підготовки майбутніх фахівців у галузі технологій і дизайну, що забезпечують досягнення атмосфери співробітництва, порозуміння й доброзичливості, сприяють формуванню умінь і навичок критичного і технічного мислення, розвитку творчого потенціалу й самореалізації, досягненню нових освітніх результатів, адекватних вимогам цифрового суспільства. Разом з тим, цифрові технології дозволяють зробити процес професійної підготовки майбутніх фахівців у галузі технологій та дизайну мобільним, диференційованим та індивідуальним на основі впровадження інноваційних підходів, включаючи використання Google-сервісів, Е-посібників, мультимедійних презентацій, використання веб-квестів, “кейсів”, методу проектів тощо. Цифрова трансформація української освіти посилює мотивацію у майбутніх фахівців у галузі технологій та дизайну до самоосвіти і саморозвитку, сприяє досягненню нових освітніх результатів, адекватних вимогам цифрового суспільства. Цифрові технології є результативними технологіями, які дають змогу підготувати особистість до активного життя в суспільстві й дозволяють редагувати, розширювати й удосконалювати соціальний досвід.

Ключові слова: професійна підготовка, цифровізація, технології, дизайн, цифрові технології, фахівці в галузі технологій та дизайну, заклад вищої освіти.