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DIGITALIZATION OF UNIVERSITY EDUCATION: ADVANTAGES, RISKS, AND PROSPECTS

This article highlights the problem of university education digitalization. It is stated that at the present stage of the information society development, digitalization is a megatrend for further development of higher education. The objective of this research is to define the essence of the concept of university education digitalization, to reveal the main advantages, risks, and prospects for implementing this process.

It is specified that digitalization of university education consists of updating the material, technical, and technological infrastructure of a university, forming an integral digital space through its saturation with electronic digital devices, means, systems, and ensuring electronic communication exchange between them and participants to the educational process.

It has been found out that the complete digital transformation of university education is facilitated by the implementation of such changes in it: the formation of an integral developing digital infrastructure; the development of a digital educational space; providing opportunities for subjects of the educational process to go beyond the physical and institutional boundaries of a university and interact with a wide range of people based on the use of various digital devices and means (B. Bygstad, E. Øvrelid, S. Ludvigsen, M. Dæhlen).

Digitalization of university education contributes to ensuring the following changes: personalization, cooperation, coherence of students' training, ease of their access to digital education, increasing their interest in educational material, high flexibility of the training regime; transformation of students into active subjects of training; facilitating the process of tracking the dynamics of changes in the state of their academic achievements; increasing the competitiveness of future specialists in the labour market; active introduction of new effective digital technologies into the educational process (S. A. Cemazar).

The article reveals certain positive and negative aspects of university education digitalization, its main risks (health-saving, social, informational) and further prospects. It is determined that the further development of this education contributes to the formation of digital universities.

Keywords: *advantages, digital educational space, digital university, digitalization, prospects, risks, university education.*

Плавчан П., Ткачова Н. О., Зенякін О. С. Цифровізація університетської освіти: переваги, ризики та перспективи. У статті висвітлено проблему цифровізації університетської освіти. Констатовано, що на сучасному етапі розвитку інформаційного суспільства мегатрендом подальшого розвитку вищої освіти є цифровізація. Мета статті – визначити суть поняття цифровізації університетської освіти, розкрити основні переваги, ризики та перспективи реалізації цього процесу.

Уточнено, що цифровізація університетської освіти полягає в оновленні матеріально-технічної й технологічної інфраструктури університету, формуванні цілісного цифрового простору через його насичення електронно-цифровими пристроями, засобами, системами й забезпечення електронно-комунікаційного обміну між ними та учасниками освітнього процесу.

З'ясовано, що повній цифровій трансформації університетської освіти сприяє здійснення в ній таких змін, як: формування цілісної розвивальної цифрової інфраструктури; розбудова цифрового освітнього простору; надання можливості суб'єктам освітнього процесу виходити за межі фізичних та інституційних меж університету і вступати у взаємодію із широким загалом людей на основі використання різних цифрових пристроїв і засобів (Б. Бюгстад, Е. Оврелід, С. Людвігсен, М. Делен).

Цифровізація університетської освіти сприяє забезпеченню: персоналізації, кооперації, зв'язаності навчання студентів, легкості їх доступу до отримання цифрової освіти, зростання їхньої зацікавленості до навчального матеріалу, високої гнучкості режиму навчання; перетворенню студентів в активних суб'єктів навчання; полегшення процесу відстеження динаміки змін в стані їхніх навчальних досягнень; підвищенню конкурентноспроможності майбутніх фахівців на ринку праці; активному запровадженню в освітній процес нових ефективних цифрових технологій (С. А. Цемазар).

У статті виявлено певні позитивні й негативні аспекти цифровізації університетської освіти, розкрито її основні ризики (здоров'язберезувальні, соціальні, інформаційні) й подальші перспективи. Визначено, що подальший розвиток цієї освіти сприяє формуванню цифрових університетів.

Ключові слова: *переваги, перспективи, ризики, університетська освіта, цифровий освітній простір, цифровий університет, цифровізація.*

Introduction. At the present stage of society development that is characterized by active shifts in all spheres of its life, there is an urgent need to reconsider the mission of universities as flagships of higher education, as well as the methods, forms, and content of their work. As noted in the Preamble of 'The Bucharest Declaration concerning Ethical Values and Principles for Higher Education in the Europe Region' (2004), modern universities play a leading role in the development of

the economy, culture, science, education, innovative technologies on a global, regional, state, and local scale. In the Declaration, it is also emphasized that the activities of modern universities are not limited only to training the future professional, technical, and social elite. They have become complex large institutions which can no longer be run solely on the basis of managing traditional academic and collegial norms (the Bucharest Declaration concerning Ethical Values and Principles for Higher Education in the Europe Region, 2004, p. 503).

International documents note that today universities should become generators of innovative progress of higher education and humanity as a whole, and therefore their activities should not be focused on meeting only the modern needs of humanity but should be carried out in an advanced mode of their development. In terms of this, the OECD report (2019) stated that universities, like other educational institutions, should focus in their development on the following three identified megatrends that largely determine the future of modern education: globalization, digitalization, and population aging (Trends Shaping Education 2019 – OECD, 2019). It should be noted that in the context of the problem raised, the main attention was paid to the study of the very second of these megatrends.

As established in the course of the research, the following aspects of this problem are highlighted in scientific works: the main conceptual foundations of informatization and digitalization of education, the formation of a digital educational and scientific environment of a university (F. Pettersson, I. Blau, M. Shyshkina, M. Zhaldak, O. Pinchuk, O. Sokoliuk, T. Shamir-Inbal, T. Vakaliuk, V. Bykov et al.); didactic potential of network technologies of open systems in training (A.-L. Barabási, D. McConnell, L. Beaty, M. Pósfai, O. Spirin, S. Ivanova, S. Mann, T. Vdovychyn, V. Hodgson et al.); pedagogical capabilities of cloud resources and services for training future specialists (A. Hurzhii, D. Linthicum, J. D. Lasica, M. G. Avram, O. Hlazunova, O. Yakobchuk, S. Hackett, T. Voloshyna, V. Korolchuk et al.); basic models, methods and means of digitalization of education (A. Lund, B. Bygstad, I. Trehubenko, O. Spivakovskiy, S. Ludvigsen, T. Aagaard, V. Glushkov, V. Hrytsenko, Yu. Tryus etc.).

The analysis of scientific literature has revealed a significant contribution of scientists on issues related to the digitalization of education. However, in the process of scientific research, it has been determined that in the modern pedagogical science, there is the lack of development of the problem of university education digitalization which has led to the choice of this article topic.

Aim and tasks. The *objective* of this article: to reveal the essence of the concept of university education digitalization, to analyse the main advantages, risks, and prospects for implementing this process.

Research methods. A set of such methods has been used in this research: general scientific (analysis, synthesis, generalization, systematization, classification) which became the basis for determining the degree of the problem development; the comparative-contrastive method provided an opportunity to compare and contrast the opinions of scientists on determining the essence of digitalization of university education, identifying advantages and risks of this phenomenon; the predictive method allowed us to outline the prospects for further development of the process of university education digitalization.

Research results. Based on the study of scientific literature, it has been concluded that digitalization of university education consists of updating the material, technical, and technological infrastructure of higher education institutions, forming an integral digital space through its saturation with electronic digital devices, means, systems, and ensuring electronic communication exchange between them and participants of the educational process who should be able to use various digital technologies in their activities. At the same time, digitalization should be perceived not as a goal in itself, but as a means, an effective tool for improving the educational process based on using the advantages of digital tools and technologies (Bygstad et al., 2022; Dukhanina et al., 2022; Tkachov et al., 2020; Trotsko, 2019).

According to some scientists (B. Bygstad, E. Øvrelid, S. Ludvigsen, M. Dæhlen), university teachers managed to adapt much faster to the new educational environment and switch to digital education than other institutions. In particular, it took only one week for the teachers working at the University of Oslo to do so (Bygstad et al., 2022). The authors also refer to scientific research data from other specialists (A. Y. Akbulut, B. Malkawi, G. Dick, J. Crawford, J. Rudolph, K. Butler-Henderson, M. Glowatz, P. Magni, R. Burton, S. Lam, V. Matta et al.) which show that universities in developed countries also spent quite a little time to make this transition (Crawford et al., 2020; Dick et al., 2020).

Explaining the reason for this fact, B. Bygstad, E. Øvrelid, S. Ludvigsen, and M. Dæhlen note that universities are traditionally distinguished by a strong material and technical base, and a highly qualified staff. Since even before the outbreak of the pandemic, it was the teachers of these higher education institutions who became the pioneers in the use of digital technologies in teaching young people; universities have accumulated valuable practical experience on this issue. In addition, they already had administrative digital systems (student registries, systems for conducting exams and recording their results, systems of personnel, educational, methodological, and financial support) which greatly facilitated the activities of universities under extreme conditions (Bygstad et al., 2022).

The above-mentioned scientists also noted that before the multifaceted social crisis caused by the emergence of the Covid-19 pandemic, there was the so-called

double digitalization: on the one hand, there was a non-integrated development of digital technologies and, on the other, there was carried out non-systematic teaching of disciplines based on the use of digital educational tools. In this regard, the Covid-19 crisis has accelerated the digital transformation of university education and contributed to the creation of the integral digital educational space in the society (Bygstad et al., 2022).

The scientific literature specifies that the modern digital educational space is an integral education that includes material and technical, digital, social, didactic, and managerial aspects (Ellis & Goodyear, 2016; Jackson, 2019). As stated by B. Bygstad, E. Øvrelid, S. Ludvigsen, and M. Dæhlen, the creation of such a space has led to the emergence of three significant changes in the organization of educational activities in higher education which together indicate the implementation of a complete digital transformation of university education. We are talking about such changes:

1. The formation of the integral developing digital infrastructure, where technical and social elements interact, makes it possible to quickly introduce new digital technologies into the educational process of universities.

2. The development of the digital educational space contributes to the emergence of new effective forms and methods of teaching which makes it necessary to reconsider the main roles of teachers and students in pedagogical interaction. Thus, teachers in the educational process should act primarily not as transmitters of new information, but as moderators, consultants, navigators, facilitators who provide operational pedagogical support in the educational activities of university students as well as monitor the progress of this activity and its results.

3. Enabling the subjects of the educational process to go beyond the physical and institutional boundaries of the university and interact with the general public through the use of digital means. At the same time, it is important to note that in organizational terms, there exist not only one but many different digital educational spaces that intersect and closely interact with each other as well as with hybrid educational and physical spaces. Consequently, the digital educational space makes possible the emergence of new forms of students' knowledge acquisition, including the inclusion of new agents outside the academic institution (Bygstad et al., 2022).

Taking into account the urgent need to ensure further development of the process of education digitalization, the Digital Education Action Plan (2021-2027) was developed under the auspices of the European Union which is an updated EU policy initiative and reflects the specialists' vision of the essence of high-quality and affordable digital education in the EU countries. This plan aims to 'support the adaptation of member states' educational systems to the digital age' (Digital Education Action Plan (2021-2027), 2020).

As noted in the scientific literature, digitalization of university education provides its advantages over traditional education. Highlighting them, S. A. Cemazar claims that this phenomenon provides for the following:

- personalization of learning which gives future specialists the opportunity to work at the optimal pace for them and in accordance with their individual knowledge and skills level of formation;
- cooperation of learning which provides for the use of various technologies of teaching and learning in the process of constructive interaction of all participants in the educational process using various digital means;
- connectivity of learning because online learning allows students and teachers to quickly communicate with each other, in particular, through instant messaging even if they are at a considerable distance from each other;
- ease of access for students, including people with special needs, to receive digital education as it allows them to participate in online courses and other university activities without having the difficulties that they might have experienced when implementing a traditional learning model;
- increasing students' interest in the educational material being studied by increasing the possibilities in the ways of presenting it (images, audio, multimedia, game methods, etc.) and enriching the content;
- high flexibility of the learning mode due to the ability of people to work with various educational materials and other participants in the educational process in the asynchronous mode;
- transformation of students into active learning entities that take responsibility for the results of this process and independently allocate their time to different types of work;
- facilitating the process of tracking the dynamics of changes in the state of their academic achievements by teachers and students, identifying amongst them those who need individual pedagogical assistance;
- better preparation of students for future professional activities, increasing their competitiveness in the labour market;
- active introduction of new efficient digital technologies and increased investment in their development (Cemazar, 2022).

N. Dukhanina and G. Lesyk emphasize that digitalization makes the educational process more mobile, flexible, differentiated, expand the range of effective methods, forms, techniques, tools, and technologies of training, ways to manage the educational activities of students, optimally combine their individual and group work. In addition, the time limit of learning frees up the teacher's time to improve feedback with students, design, and implement their individual educational

routes, and provide support to future specialists in implementing the idea of lifelong education (Dukhanina et al., 2022).

At the same time, scientists note that digitalization of university education has not only positive, but also negative characteristics. In particular, the scientific literature notes the following:

- an increase in the teacher's time load which is not always taken into account when calculating their salaries;
- leveling the function of socialization of university students due to a significant decrease in the volume of their live communication with other people, in particular, within the micro-society of higher education institutions;
- the emergence of a potential threat of destruction of the traditional education model which is reflected in the depreciation of humanitarian knowledge against the background of the development of education digitalization;
- causing harm to the health of participants in the educational process by spending significant time in front of a computer screen or other digital learning tools (Kuznetsova, 2020; Areshonkov, 2020).

The scientific literature also notes the expediency of considering the main risks generated by the very fact of implementing the educational process in the digital environment. Thus, these risks include risks associated with the possibility of deterioration of the health of participants in the educational process due to abuse of working with a computer or various devices. There is also a risk of loss (deterioration) of a person's social skills because previously the institution of higher education traditionally acted as a place of active 'live' interaction of the individual with other people (Kuznetsova, 2020; Mocci, et al., 2001).

In addition, the risks of teaching a person in the digital environment include information risks. A prominent place amongst them is occupied by the following:

1. Risks of privacy violations. They are related to the possibility of illegal dissemination of personal information about participants in the educational process: photos, contact details, rating data, individual tasks completed. A violation of privacy can have various negative consequences: non-compliance with copyright, replacement of authentication data, use of personal data for criminal purposes, and so on.

2. Risk of violating the integrity of the educational content. This risk implies the possibility of violating the logical integrity of the didactic system where the content of education is structured and based on taking into account the logic of the learning process. Facts of violation of the integrity of the education content, for example, include: making technical errors when transmitting data over communication channels, storing this data, or their non-compliance with the state educational standard.

3. Risk of deterioration of access to the digital educational environment. This risk reflects the danger of unavailability of educational content (the situation can vary from the absence of separate content on a specific topic or academic discipline to blocking or even destroying the educational environment without providing alternative ways to obtain the necessary information due to the existence of an educational monopoly on it).

4. Risk of violation of the accuracy of information. It assumes the ability of a certain individual to impersonate another computer user. At the same time, this person can be either a participant in the educational platform or a person who illegally entered it. The result of its activities may be, for example, unauthorized changes to the content provided, fraudulent actions to perform independent work or pass an exam instead of another student, making changes to the electronic assessment system, and so on.

5. Risks of non-compliance violation. They include the ability of educational participants to refuse to create, transmit, or receive information (Kuznetsova, 2020).

The study also found that digitalization of the educational process requires the university to conduct such important events:

- development and implementation by each university of its own unique digital model of higher education, taking into account the specifics of its work and the autonomy granted;
- formation of the optimal structure of the specified institution for ensuring digitalization of education and integration of all its components into an effective system, on the basis of which the formation of a digital university takes place;
- combining all elements of information and communication technologies used in the educational process and available technical training tools into a complete set of effective network learning tools which is a necessary prerequisite for turning an institution into a digital university;
- in the light of the new requirements, a clear definition of the role, professional responsibilities, tasks, and types of activities for scientific, scientific-pedagogical and pedagogical employees of this university;
- implementation of targeted replacement of the traditional educational space, in which classroom learning was central, with a virtual network space;
- search, selection, development of new effective methods and techniques of online learning that match the educational tasks set;
- establishing effective communication between all the participants in the educational process in a network environment (Areshonkov, 2020).

As noted in the scientific literature, in the light of the definition of further prospects for digitalization of university education, there is a need to conduct research on finding ways to eliminate the shortcomings identified in this process as

well as clarify some still unclear issues. In particular, scientists note that the digital tools available today are not able to create a favourable psychological atmosphere during the implementation of pedagogical interaction, do not take into account the importance of the role of emotions in human life, and do not sufficiently ensure its reflection and self-assessment. It is also established that the improvement of digital education requires the creation of an effective mechanism for managing digital learning which should cover not only teachers and students but also other participants to this process who organize and coordinate the interaction of people and digital resources. In addition, there is a need for a more detailed study of the possibilities of mobile devices as a means of learning (Bygstad et al., 2022; Reddy et al., 2017; Collazos et al., 2021).

N. Dukhanina and G. Lesyk also note that the main directions of ensuring further digitalization of the educational process are associated with the further development of such aspects of it:

- virtual, augmented, and mixed reality, cloud technologies, internet, and mobile technologies;
- basic models of distance and blended learning;
- mass open online courses;
- gamification of the learning process;
- digital libraries and university campuses (Dukhanina et al., 2022).

Discussion. In comparison with previous scientific research, the article offered presents the authors' approach to revealing the essence of the concept of university education digitalization, summarizes the points of view of scientists on determining the main advantages, risks and prospects for implementing this process.

Conclusions. Based on the above-said, it is concluded that the leading megatrend for the development of university education is its digitalization which has certain positive and negative aspects. Further development of this education contributes to the formation of a new type of higher education institutions – digital universities. In such a situation, the subject for further scientific research should be not only the improvement of the material, technical, and technological base for creating an integral digital educational space but also the pedagogical competent provision of its social, didactic, educational, and managerial aspects. After all, only in this case it is possible to provide training of graduates who will be distinguished by a high level of formation not only of professional and digital competence but also of socially significant value orientations, moral and volitional qualities, and readiness for full self-realization as a professional and as a unique individual.

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