Creating a digital institution of higher education: theory and practice

Creación de una institución digital de educación superior: teoría y práctica

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Abstract

The transfer of activities to the virtual space under modern conditions is recognized as an important factor in the success of political, economic, social and cultural relations in the

society. Currently, social challenges and strategic directions of professional and personal development of the young generation require the creation of an effective educational system that would take into account the conditions of the digital reality in which the general economic, business and social spheres around the world function. Taking into account the above-mentioned, nowadays, the goal of higher education lies in coordinating the actions of its various subjects for the most effective educational influence on children and youth in the digital space, combining the efforts of the state, education, family and the real economy, creating a safe digital environment conducive to the development of the student's personality. The issue of organizing the successful operation of digital institutions of higher education is extremely urgent, taking into consideration the global trends of the transition of the educational sphere to blended and distance learning. The purpose of the academic paper lies in analysing the various standpoints of scientists regarding the functioning of a modern digital institution of higher education, as well as investigating the practical aspects of organizing the educational process in higher education by virtue of digital tools. Methodology. In the course of conducting the research, bibliographic and analytical methods have been used in order to analyse the scientific literature on the activities of digital institutions of higher education, as well as an online survey for the practical clarifying the individual features of the activities of a digital institution of higher education. Results. Based on the results of the research, the principal aspects of the operation of digital institutions of higher education have been analysed and the preferences of students of such institutions in the areas of improving the virtual educational process have been established.

Key words: digitization, digital institution of higher education, online education, digital educational technologies, virtualization of the educational process.

Resumen

La transferencia de actividades al espacio virtual en las condiciones modernas se reconoce como un factor importante en el éxito de las relaciones políticas, económicas, sociales y culturales en la sociedad. Actualmente, los desafíos sociales y las direcciones estratégicas del desarrollo profesional y personal de la generación joven requieren la creación de un sistema educativo efectivo que tenga en cuenta las condiciones de la realidad digital en la que funcionan las esferas económicas, empresariales y sociales en general en todo el mundo. Teniendo en cuenta lo anterior, hoy en día, el objetivo de la educación superior radica en articular las acciones de sus diversas asignaturas para la más efectiva incidencia educativa de los niños y jóvenes en el espacio digital, aunando los esfuerzos del estado, la educación, la familia y la economía real, creando un entorno digital seguro y propicio para el desarrollo de la personalidad del alumno. El tema de organizar el funcionamiento exitoso de las instituciones digitales de educación superior es extremadamente urgente, teniendo en cuenta las tendencias globales de la transición de la esfera educativa a la educación semipresencial y a distancia. El propósito del trabajo académico radica en analizar los diversos puntos de vista de los científicos sobre el funcionamiento de una institución de educación superior digital moderna, así como

investigar los aspectos prácticos de la organización del proceso educativo en la educación superior en virtud de las herramientas digitales. Metodología. En el curso de la realización de la investigación, se han utilizado métodos bibliográficos y analíticos para analizar la literatura científica sobre las actividades de las instituciones digitales de educación superior, así como una encuesta en línea para la práctica que aclara las características individuales de las actividades de una institución digital de educación superior. Resultados. Con base en los resultados de la investigación, se han analizado los principales aspectos del funcionamiento de las instituciones digitales de educación superior y se han establecido las preferencias de los estudiantes de dichas instituciones en las áreas de mejora del proceso educativo virtual.

Palabras clave: digitalización, institución digital de educación superior, educación en línea, tecnologías digitales educativas, virtualización del proceso educativo.

1. Introduction

Digitization as a way of including a person in the social environment is a feature of nowadays and an important prerequisite for successful functioning in a civilized society, forasmuch as this means of communication makes it possible to level out geographical, social-cultural, demographic and other types of barriers to information exchange and provides additional opportunities for intellectual, social, communicative and other types of personality development.

Under such conditions of global digital consumption, the focus of attention of both scientists and all other members of the society as potential participants in the educational process is the digitization of higher education as an environment where relations regarding the creation and development of an intellectual product accumulate.

The theoretical part of the present research represents the viewpoints of scientists regarding the relevance of digitalization of the educational environment, the essence of the process of virtualization of a higher educational institution; it provides an overview of the challenges facing higher educational institutions in connection with the organization of the learning system using electronic educational tools, characterizes the essence of development and meaningfulness of virtual educational process.

The practical part of the research includes clarifying the advantages of using Internet tools in the educational process of a digital university, identifying the priority of skills that students would like to improve thanks to the use of virtual tools in the course of acquiring education, highlighting the desired areas of work of public organizations and international educational structures regarding the development of digital institutions of higher education, as well determining the basic development problems of this type of higher educational institutions and the desired directions of improving the training of their teachers.

According to the results of the research, it has been established that the main advantages of the digitalization of the educational process based on students' standpoint are as follows: the creation of favourable conditions for the development of independent learning skills, the opportunity to choose material for self-development, the formation of personal mobility, and the increase of motivation for self-education and self-development. In the course of the research, it has been revealed that the degree-seeking students consider the improvement of psychological, digital abilities and public speaking skills should be the priority areas of professional training for teachers. As the survey has shown, by the aid of using virtual tools during training in digital institutions of higher education, in addition to the acquired knowledge in the speciality, students would like to improve such skills as the ability to apply the knowledge acquired in online education, to master the algorithm for solving typical technical problems in distance learning, as well as to acquire communication skills of organizing the educational process in the online educational environment. Respondents consider training the potential higher education seekers the skills of working with digital technologies and electronic resources and increasing the level of access to electronic resources of all strata of the population to be the desired directions of the work of public organizations and international educational structures. As the survey has shown, the principal problems faced by degree-seeking students in digital institutions of higher education are the formalization of education, the very high pressure on students in the educational process and the low level of teachers' skills on working with digital tools.

2. Literature Review

Taking into account the complication of the economic, political and social conditions that have developed around the world, primarily due to the spread of the COVID-19 pandemic and the intensification of the military aggression of the Russian Federation against Ukraine, the education system faces complex challenges related to the ability of higher educational institutions to ensure quality, sustainability and continuity of education and professional development of its education seekers.

The above-mentioned makes it necessary to use blended and distance forms of education, which contributes to the strengthening of reforms in the field of education related to the digitalization of the educational environment, ensuring high-speed access of educational institutions to the Internet, providing education seekers, scientists and teachers with the opportunity to work with digital tools.

Currently, scientists pay considerable attention in their work to various aspects of the activities of higher educational institutions in the conditions of digitalization of the educational process (Alenezi, 2021), (Rodríguez-Abitia & Correa, 2021).

In particular, Castro, M.L., Tamayo, J.A., Arango, M.D., Branch, J.W., & Burgos emphasize that digitalization reflects the modern paradigm of the society development,

when the competitiveness and effectiveness of online learning turn up as vital qualities for specialists in all fields of activity (Castro, Tamayo, Arango, Branch, & Burgos, 2020).

Digitization facilitates the simplification of the educational process, making it more flexible and adapting it to the realities of today, which ensures the training of competitive specialists (Marks & Al-Ali, 2020).

Taking into account the successful international experience of educational activity in the online mode and the creation of network of digital higher educational institutions, the need and possibility of digitalization of higher education in current conditions is obvious (Areshonkov, 2020).

However, the concept of "digitization of a higher educational institution" is much more voluminous in content than simply introducing modern information and communication technologies into the educational process of universities. A modern digital university is an educational institution that has undergone fundamental changes in the structure, content of education, approaches to management, the process of human capital development, scientific activity, and the education quality management system (Luk'yanenko & Stepanenko, 2018).

F. Rampelt, D. Orr and A. Knoth agree with this view point, noting that digitalization of higher education is a complex and ambiguous process. Along with this, scientists emphasize that digitalization of higher education also has negative aspects that should be taken into account when planning transformations (Rampelt, Orr & Knoth, 2019).

In this regard, V. Areshonkov points to a reduction in the number of higher education seekers in the conditions of open and online education, as well as to a real increase in the load on teachers in the conditions of digitalization of the educational process, certain aspects of which have not normatively taken into account in the system of standardization of labour remuneration yet. In addition, the function of socialization of education seekers, who, to a certain extent, are not included in the micro society of the university and are individualized in the digital environment, is levelled, while there is a potential threat of destruction of the traditional educational model, which is expressed in a decrease in the quality of the educational process and a partial loss of the content of humanitarian knowledge in the process of digitalization of education (Areshonkov, 2020).

Starting from 2020, in the framework of introducing mass blended and distance learning, the universities of the world were forced to quickly enter the environment of digital education (Saputra, Onyemaechi & Sutanto, 2022).

Higher educational institutions have faced a number of challenges, namely:

− search for the optimal model of digitalization by every particular university;
− the need to establish a convenient structure of the university and combine the components of this structure into an effective system;

- combining the elements of information and communication technologies available in each university into a system on the basis of which a digital university emerges, and transforming technical means of education into effective network tools;
- determination of the role, tasks and types of activities of scientific, scientific-pedagogical and pedagogical workers of such an educational institution;
- replacing the traditional educational space with a virtual network space;
- search for distance learning methods and techniques suitable for educational goals;
- establishment of effective communication of all participants of the educational process in the network environment (Areshonkov, 2020).

The process of digitalization of education involves substantiating the legality of its main provisions, establishing ways of implementing the approved pedagogical concept within the framework of its effective use, regulating regulatory and methodological aspects, determination of the place of digital technologies in didactics and the system of integrative knowledge, delimiting the areas to which these provisions relate, conditions for the effective functioning and development of the sphere under study, the introduction of training the teachers and the establishment and implementation of the standards of their professional activity (Brdesee, 2021), (Vidor & Budde, 2022).

3. Aims

The purpose of the research lies in figuring out the principal aspects of the work of a modern digital higher educational institution from the point of view of students, namely: establishing the advantages of using digital tools in the educational process of a digital university, the priority of skills that students would like to improve thanks to the use of virtual tools in the course of training, identifying the desired areas of work of public organizations and international educational structures regarding the popularization and promotion of the development of digital institutions of higher education, outlining the main problems of the development of this type of higher educational institutions and the desired directions for improving the training of their teachers.

4. Materials and Methods

A practical study of the features of the functioning of a modern digital institution of higher education was conducted in 2022 by surveying 173 students of 12 higher educational institutions located in Kyiv, Zhytomyr, Lviv and Khmelnytskyi regions of Ukraine. Respondents acquire higher education in humanitarian and technical specialities with the use of the latest digital technologies.

The survey was conducted through an online questionnaire using the Simpoll service.

5. Results and Discussion

In the course of conducting the research, the viewpoints of the respondents regarding the general advantages of the digital transformation of education were figured out. Students of institutions of higher education participating in the survey had the opportunity to be participants in the educational process both offline and under the conditions of the institution operation by virtue of using digital services; consequently, they can assess the advantages and disadvantages of virtual tools applied to ensure the educational process.

Figure 1 reflects the distribution of survey participants' responses regarding the basic positive features of digital learning as follows.

As it can be observed from Figure 1, the principal advantages of the digitalization of the educational process for students of both humanitarian and technical specialities include the creation of favourable conditions for the development of independent learning skills, the opportunity to choose the most valuable material for self-development, the formation of personal mobility, the ability to quickly adapt to unpredictable and rapidly changing conditions, increasing motivation for self-education and self-development.

In the process of the survey, the preferences of the education seekers regarding the directions of training the pedagogical workers, which should precede the involvement of teachers in the organization of the educational process in a digital institution of higher education, were figured out (Figure 2).

The study has revealed that the education seekers consider the improvement of their psychological and pedagogical, digital abilities and public speaking skills to be the most significant directions of professional training of teachers.

In the course of the survey, the prioritization of skills that students would like to improve by virtue of using the virtual tools while studying in digital institutions of higher education was studied (Figure 3).
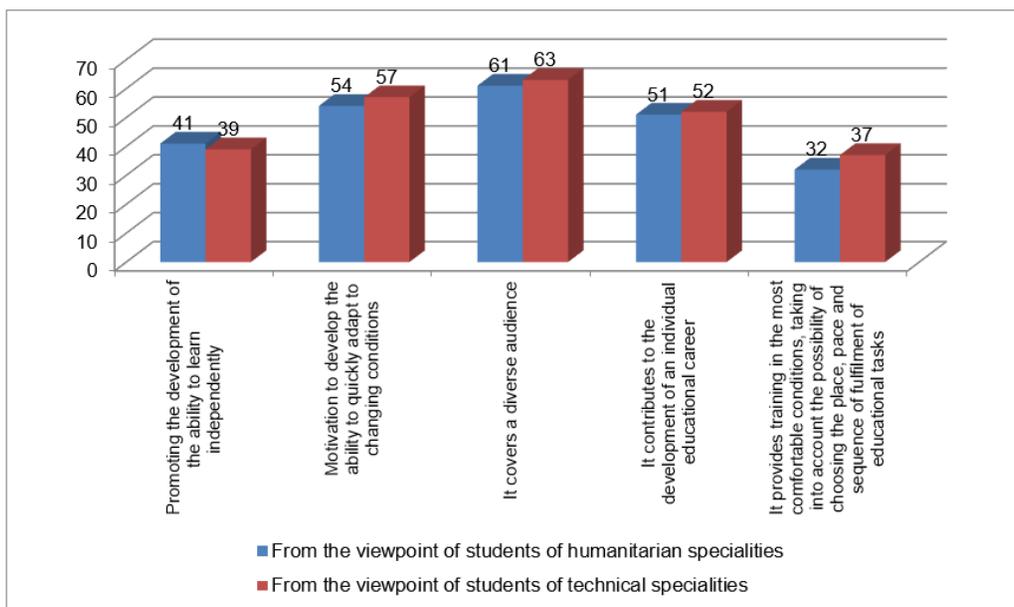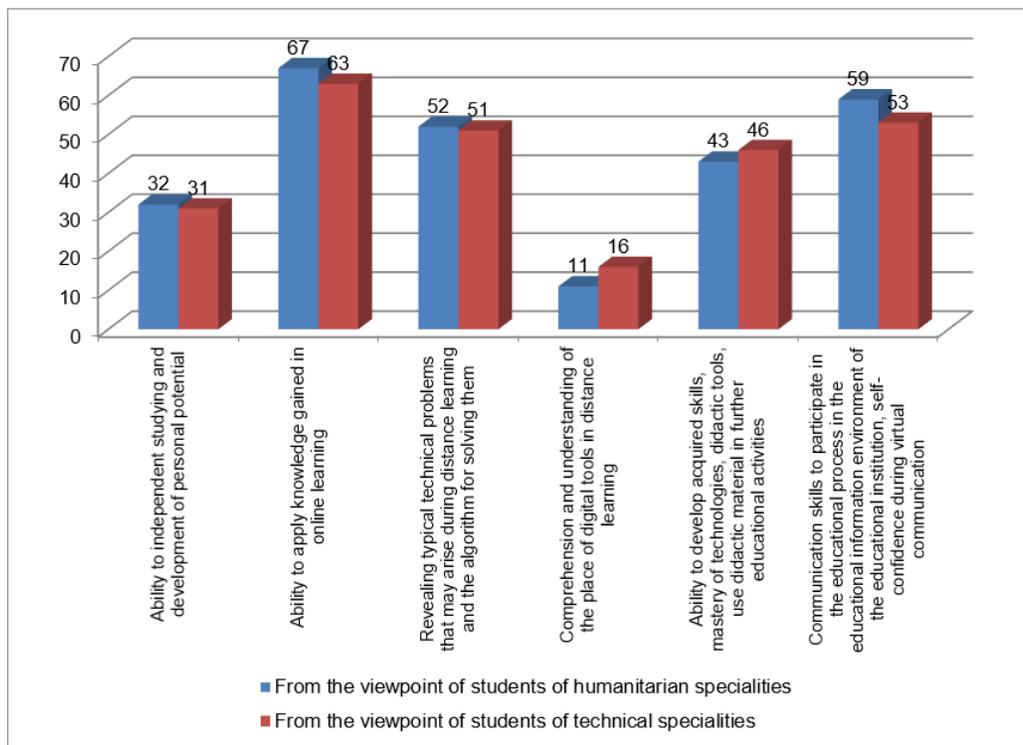
Figure 1. Advantages of using digital tools in the educational process in institutions of higher education, %.
Source: it has been compiled by the authors.
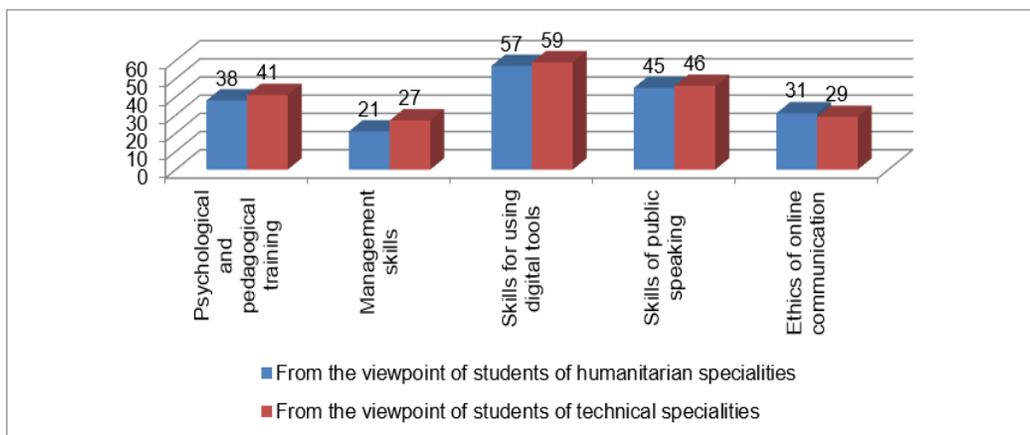
Figure 2. The preferences of education seekers regarding the directions of training the pedagogical workers prior to their involvement into the educational process, %.
*Source: it has been compiled by the authors.*

Figure 3. The prioritization of skills that students would like to improve by virtue of using the virtual tools while studying in digital institutions of higher education, %.
Source: it has been compiled by the authors.

As the analysis of the answers of the survey participants has shown, by virtue of using the virtual tools when studying in digital institutions of higher education, the degree-seeking students, in addition to the acquired knowledge in their specialty, would like to improve the skills as follows: the ability to apply the knowledge gained in online education, to comprehend the essence of typical technical problems that may arise during distance learning, and to establish the algorithm for solving them, as well as to acquire communication skills in order to organize the educational process in the educational information environment of the educational institution.

An important question posed to the respondents was to find out the desired, from the point of view of education seekers, directions of work of public organizations and international educational structures regarding the popularization and promotion of the development of virtual education (Figure 4).
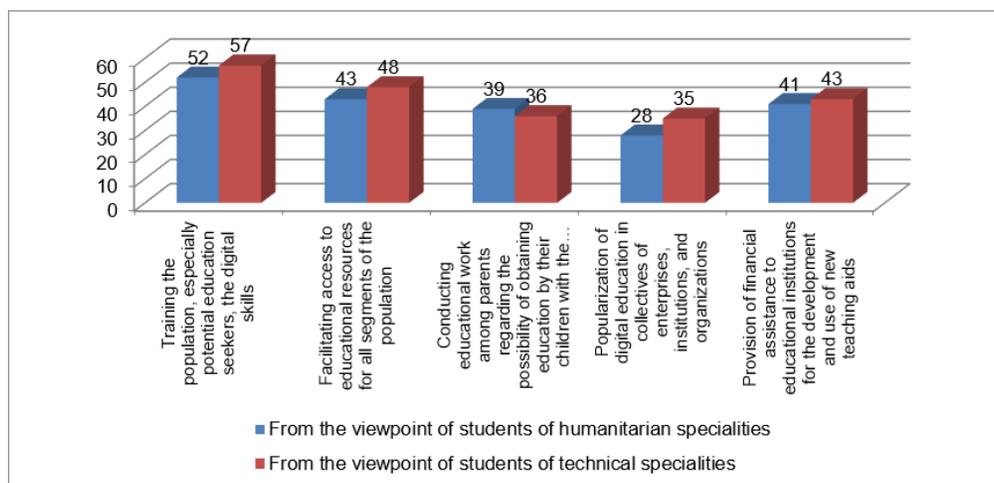
Figure 4. The desired directions of work of public organizations and international educational structures regarding the popularization and promotion of the development of digital institutions of higher education, %.
Source: it has been compiled by the authors.

As it can be observed from Figure 4, the desired areas of work of public organizations and international educational structures in the direction of popularization and promotion of the development of digital institutions of higher education are as follows: training potential education seekers the skills of working with digital technologies and electronic resources, increasing the level of access to electronic resources of all segments of the population and providing financial assistance to digital educational institutions in order to improve the software of the educational process.

The basic problems of the development of digital institutions of higher education, which, according to the survey participants' viewpoints, need an urgent solution, include as follows (Figure 5).
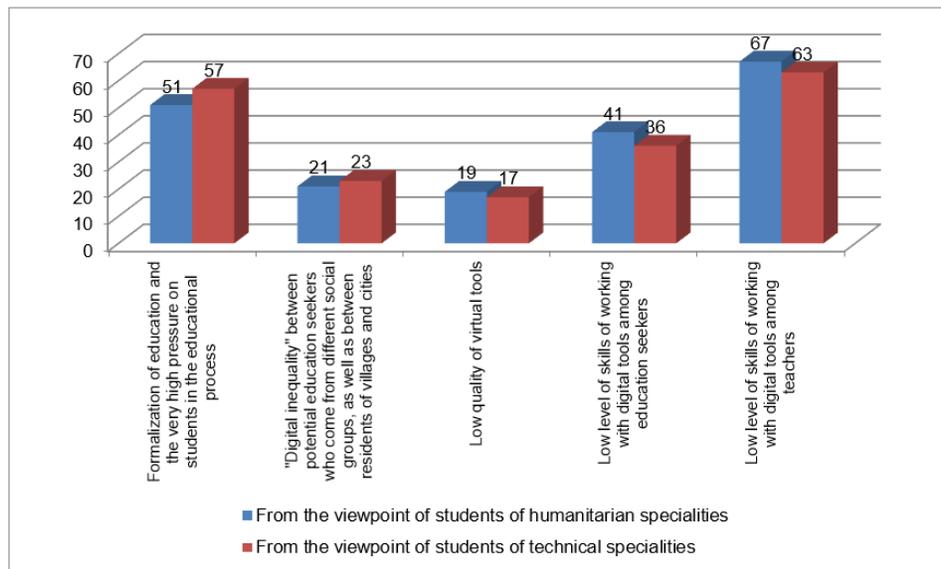
Figure 5. The basic problems of the development of digital institutions of higher education, %.
Source: it has been compiled by the authors.

As the survey has shown, the basic problems faced by education seekers in digital higher educational institutions are the formalization of education and the very high pressure on students in the educational process, as well as the low level of skills of teachers in using and applying the digital tools.

According to the standpoint of Y. B. Rajabalee and M. I. Santally, qualitative changes in the global educational space are impossible without global digitalization – the organization of the educational process by virtue of modern digital technologies. Taking the outlined into consideration, in order to achieve qualitative transformations in the educational sphere, it is necessary to organize the preparatory process, as well as to introduce digital transformation as a new educational paradigm (Rajabalee & Santally, 2021).

At the same time, H. Q. Yousaf, S. Rehman, M. Ahmed and S. Munawar believe that the organization of independent work of students, their effective interaction with teachers have become the main issues that require the use of modern methods and technologies of learning. For teachers, the main challenges related to the digitalization of education have become the following ones, namely: acquisition of skills and abilities to methodically competently and technically optimally select the content of the educational material, to be able to visualize the essential parts of this content, to create cases for independent work of students, to organize interactive activities during mastering the new material, to apply the innovative methods, while combining elements of mixed and distance learning (Yousaf, Rehman, Ahmed & Munawar, 2022).

The development of digital education is taking place due to the improvement of technologies contributing to the creation of virtual and real links between education, science, society, government, business and innovation. It is the digital education that promotes the effective cooperation of a wide range of lecturers, students, pupils, teachers in the field of acquiring new knowledge and acquiring digital skills (Fischer, Imgrund, Janiesch & Winkelmann, 2020).

K. Sandkuhl and H. Lehmann emphasize that digital educational technologies allow designing the learning process in such a way that it is mobile, differentiated, individual, interesting and diverse (Sandkuhl, & Lehmann, 2017).

At the same time, such scholars as J. Selingo, C. Clark, D. Noone and A. Wittmayer note that modern virtual educational technologies provide the opportunity for the teacher to automate most of his work, free up human resources for searching, communication and individual work with students, get instant feedback communication from them and increase the efficiency of management of the educational process (Selingo, Clark, Noone & Wittmayer, 2020).

Therefore, the digitalization of education involves the use of mobile and Internet technologies by students, thereby increasing the horizons of their knowledge, expanding their boundaries. The productive use of digital technologies, the involvement of education seekers into independent research, the selection of information, participation in project activities form in students new competencies necessary for success in the XXI century.

Recently, open online resources have been actively created and used, implementing numerous tools, starting with individual tasks and tests and ending with complex courses (modules) with the formation of the necessary skills (Al-araibi, Mahrin & Yusoff, 2019).

This tendency is confirmed by S. Karpliuk, who, in particular, notes that the dynamics of the development of online education is reflected in increasing the availability of online courses (Karpliuk, 2019).

The development and meaningfulness of the virtual educational process is carried out with the help of software solutions that provides an opportunity to construct training courses from available sources of information and in specialized software environments, systems of author development and automated design. The system of virtual education makes it possible to effectively apply new technological means and unlimited information resources in the educational process. Online courses and blended learning create a field of unlimited educational opportunities, focusing on the specific needs of each person, regardless of their place of residence, but in accordance with their interests and abilities. Such changes require the teacher to be proficient in the digital educational environment. Against this background, the future task of all universities lies in improving the qualifications of teachers in terms of digital competencies, focusing not only on the development of courses, but also on using and applying the digital environment in the

educational process. The digital environment requires teachers to possess a different mentality, a different worldview, the use of more progressive means of working with students (Karpliuk, 2019).

In addition to traditional educational tools, nowadays, non-traditional software tools are used in the society, which can be explained by the growth of innovative competence of participants in the educational process (Barna & Kuzminska, 2020).

The basic changes that can be observed in the educational system of the world today are the changing role of higher educational institutions, which should not only ensure the educational process, but also become a platform for creating innovations with the constant use of the latest scientific developments, combining resources to implement joint projects, creating scientific and educational online platforms (Yehorchenkova, Teslia, Khlevna & Kychan, 2020).

As the results of the conducted survey have shown, the digitalization of the educational environment in higher educational institutions is aimed at the comprehensive development of the student's personality; it contributes to increasing the overall effectiveness of training due to the individualization and differentiation of the educational process.

As V. Huzhva notes, digital tools facilitate communication between students and help organize joint learning, contributing to the reduction of social inequality, free access to open educational systems and a global array of information in a digital educational environment (Huzhva, 2019).

6. Conclusions

Therefore, the conducted research makes it possible to conclude that nowadays digitalization is a key factor in improving the system of higher education in the world. In addition to the direct impact on the efficiency of the educational process, the use of virtual tools in higher education has a number of indirect advantages forasmuch as thanks to digitalization, the educational process becomes more accessible and flexible. The present research has confirmed the relevance of the virtualization of the educational space, in particular, the search for more effective ways of implementing electronic tools as a set of means that optimize learning, ensure personalization and automation of routine educational processes.

The conducted survey has proven that the digitization of the educational environment in higher educational institutions is one of the driving forces for developing an effective society based on the "digital economy" and training educated future specialists; after all, it is impossible to fully integrate into the modern economic and social system without skills in working with information and digital technologies. At the same time, the main problems faced by higher educational institutions during the transition of the educational environment to the virtual space are the low digital literacy of teachers and students, the

excessive workload of students with formal tasks and the lack of experience and the necessary educational tools that would allow them mastering the necessary learning technologies.

7. Bibliographic references

Al-araibi, A., Mahrin, M. N., & Yusoff, R. (2019). Technological aspect factors of E-learning readiness in higher education institutions: Delphi technique. Education and Information Technologies, 24, 1. https://doi.org/10.1007/s10639-018-9780-9.

Alenezi, M. (2021). Deep Dive into Digital Transformation in Higher Education Institutions. Education Sciences, 11(12), 770. https://doi.org/10.3390/educsci11120770

Areshonkov, V. (2020). Digitization of higher education: challenges and answers [Tsyfrovizatsiia vyshchoi osvity: vyklyky ta vidpovidi]. Visnyk NAPN Ukrainy – Bulletin of the National Academy of Sciences of Ukraine, 2, 2. https://doi.org/10.37472/2707-305X-2020-2-2-13-2

Barna, O., & Kuzminska, O. (2020). Determining the readiness of a higher education institution for digital transformation. Modern information technologies and innovative teaching methods: experience, trends, perspectives: materials of the 4th International Scientific and Practical Internet Conference [Vyznachennia hotovnosti zakladu vyshchoi osvity do tsyfrovoi transformatsii. Suchasni informatsiini tekhnolohii ta innovatsiini metodyky navchannia: dosvid, tendentsii, perspektyvy: materialy IV Mizhnarodnoi naukovo-praktychnoi internet-konferentsii], Ternopil, TNPU im. V. Hnatiuka, 92–93. http://dspace.tnpu.edu.ua/bitstream/123456789/15374/1/31_Barna_Kuzminska.pdf

Brdesee, H. (2021). A Divergent View of the Impact of Digital Transformation on Academic Organizational and Spending Efficiency: A Review and Analytical Study on a University E-Service. Sustainability, 13(13), 7048. DOI: https://doi.org/10.3390/su13137048

Castro, M.L., Tamayo, J.A., Arango, M.D., Branch, J.W., & Burgos, D. (2020). Digital Transformation in Higher Education Institutions: A Systematic Literature Review. Sensors, 20(11), 3291. DOI: https://doi.org/10.3390/s20113291

Fischer, M., Imgrund, F., Janiesch, C., & Winkelmann, A. (2020). Strategy archetypes for digital transformation: Defining meta objectives using business process management. Information & Management, 57(5), 103262. https://doi.org/10.1016/j.im.2019.103262

Huzhva, V. (2019). Digital transformation of universities [Tsyfrova transformatsiia universytetiv]. Eastern Europe: Economics, Business and Management [Skhidna Yevropa: ekonomika, biznes ta upravlinnia], 21, 597–604. https://ir.kneu.edu.ua/handle/2010/36938?show=full

Karpliuk, S. (2019). Materialy metodolohichnoho seminaru NAPN Ukrainy of digitization of the educational process in higher education. Information and digital educational space of Ukraine: transformational processes and development prospects. Materials of the methodological seminar of the National Academy of Sciences of Ukraine [Osoblyvosti tsyfrovizatsii osvitnoho protsesu u vyshchii shkoli. Informatsiino-tsyfrovyi osvitnii prostir Ukrainy: transformatsiini protsesy i perspektyvy rozvytku]. Kyiv, 188–197. https://cutt.ly/7CBKxuA

Luk'yanenko, D., & Stepanenko, O. (2018). Digital university: the project of building a digital university at the Vadym Hetman Kyiv National University of Economics. In Digital Economy: Proceedings of the National Scientific and Methodological Conference [Digital university: proiekt rozbudovy tsyfrovoho universytetu v DVNZ "Kyivskyi natsionalnyi ekonomichnyi universytet imeni Vadyma Hetmana". In Tsyfrova ekonomika: Zbirnyk materialiv Natsionalnoi naukovo-metodychnoi konferentsii], Kyiv, KNEU, 245–249. https://bit.ly/30tuCOP

Marks, A., & Al-Ali, M. (2020). Digital Transformation in Higher Education: A Framework for Maturity Assessment. International Journal of Advanced Computer Science and Applications, 11(12), 1. https://doi.org/10.14569/IJACSA.2020.0111261

Rajabalee, Y. B., & Santally, M. I. (2021). Learner satisfaction, engagement and performances in an online module: Implications for institutional e-learning policy. Education and Information Technologies, 26(2), 1-34. https://doi.org/10.1007/s10639-020-10375-1

Rampelt, F., Orr, D., & Knoth, A. (2019). Bologna Digital 2020. White Paper on Digitalisation in the Europen Higher Education Area. University Forum Digitization. https://hochschulforumdigitalisierung.de/sites/default/files/dateien/2019-05_White_Paper_Bologna_Digital_2020_0.pdf

Rodríguez-Abitia, G., & Correa, G. (2021). Assessing Digital Transformation in Universities. Future Internet, 13(2), 52. https://doi.org/10.3390/fi13020052

Sandkuhl, K., & Lehmann, H. (2017). Digital Transformation in Higher Education – The Role of Enterprise Architectures and Portals. Digital Enterprise Computing, 49–60. https://dl.gi.de/handle/20.500.12116/119

Saputra, N., Onyemaechi, U., & Sutanto, H. (2022). Synergizing Learning Resources and Online Experience: The Pivotal Role of Digital Lecturing Skill in Higher Education. GATR Journal of Management and Marketing Review, 7(2), 54–65. https://doi.org/10.35609/jmmr.2022.7.2(1)

Selingo, J., Clark, C., Noone, D., & Wittmayer, A. (2020). The Hybrid Campus – Three Major Shifts for the Post-COVID University. New York: Deloitte Centre for Higher Education Excellence. https://www2.deloitte.com/content/dam/insights/articles/6756_CGI-Higher-ed-COVID/DI_CGI-Higher-ed-COVID.pdf

Vidor, S., & Budde, C. E. (2022). A Maturity Assessment Model for Cyber Security Education in Europe. In book: Information Security Education - Adapting to the Fourth Industrial Revolution, 60–74. https://doi.org/10.1007/978-3-031-08172-9_5

Yehorchenkova, N., Teslia, Yu., Khlevna, Yu., & Kychan, O. (2020). Methodological aspects of creating a digital university [Metodolohichni aspekty stvorennia tsyfrovoho universytetu]. Bulletin of the National Technical University "Kharkiv Polytechnic Institute" [Visnyk Natsionalnoho tekhnichnoho universytetu "Kharkivskyi politekhnichnyi instytut"], 1, 31–36. https://doi.org/10.20998/2413-3000.2020.1.4

Yousaf, H. Q., Rehman, S., Ahmed, M., & Munawar, S. (2022). Investigating students' satisfaction in online learning: the role of students' interaction and engagement in universities. Interactive Learning Environments, 3. https://doi.org/10.1080/10494820.2022.2061009