

DIGITIZATION OF HIGHER EDUCATION IN UKRAINE: ORGANIZATIONAL AND APPLIED ASPECTS

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Abstract

Today in Ukraine, a digital transformation of the educational system of higher education is taking place at a rapid pace, in which information and communication technologies are not becoming an additional 'load' in learning, but an integral part of a comprehensive educational process, which increases its efficiency. At the same time, there are a number of challenges, including such specific ones as unprovoked military aggression, which complicates the process of entry of higher education in Ukraine into the global educational digital environment. To assess the significance of the digitalization of the educational system of higher education in Ukraine in specific conditions, to analyze the attitude of the teaching staff and students to online education, to establish technical means of participation in the educational process, to determine the advantages and disadvantages of distance learning through the prism of the experience of teaching staff and students, we used three main methods: the survey method, the method of analysis and synthesis, the graphical method. As a result of the study, the authors revealed the general concept of digitalization and its educational dimension; identified the main challenges faced by higher education institutions in the digital environment; determined the impact and scale of military aggression by the Russian Federation on the activities of Ukrainian universities; established the features of training in the digital environment by institutions of the higher education of Ukraine.

Key words: digitalization, higher education in Ukraine, educational system, digital environment, teaching staff, students.

Introduction

Digitalization is a product of the fourth industrial revolution, which is characterized by the active, rapid introduction of new innovative technologies that bring changes to all spheres of human life. New technologies give birth to others, primarily digital technologies, introducing them into the economy, culture, politics, public sector and education. This trend, caused by the global COVID-19 pandemic and catalyzed in Ukraine by unprovoked military aggression by the Russian Federation, has accelerated the pace of reforming the higher education system, determining the primary need to reorient the educational process to functioning in a digital environment.

Institutions of higher education that want to remain relevant and competitive in the 21st century are turning to digital technologies to improve the quality and accessibility of the educational process, to achieve new educational results harmonized with the requirements of the modern digital society.

As a result of the digital revolution, the very concept of higher education has undergone radical changes, starting with system-forming provisions. Therefore, responding to the challenges of digital modernity, higher education institutions around the world are accelerating the digital transformation of their activities caused by the fourth industrial revolution, which led to the emergence of a new educational and technological dimension: global, dynamic, competitive, in which they should develop.

The purpose of the study is to assess the importance of digitalization of the educational system of higher education in Ukraine, to establish the attitude of teaching staff and students to online learning, to determine its advantages and disadvantages through the prism of the experience of teachers and students in the context of a sudden transition to distance learning, staying in it for a long period and the impact on the educational process of such a specific factor as military aggression.

The objectives of the study are:

1. To reveal the general concept of digitalization and its educational dimension.
2. Identify the main challenges faced by higher education institutions in the digital environment.
3. To determine the impact and scale of the military aggression by the Russian Federation on the activities of higher education institutions in Ukraine and the formation of the educational process by them.
4. To establish the attitude of teaching staff and students to online learning, technical means of participation in the educational process, the advantages and disadvantages of digitalization of the educational system of higher education for respondents.

Materials and Methods

To assess the level of digitization of higher education in Ukraine, in the specific conditions of its course and determination of its advantages and

disadvantages through the prism of the experience of teaching staff and students in the context of a sudden transition to distance learning and staying in it for a long period, we used three main methods: the survey method, the method of analysis and synthesis and the graphic method. The study was conducted in Ukraine. Mykolaiv National Agrarian University, located in Mykolaiv (hereinafter referred to as the 'MNAU'), became the basis of the study. In the system of higher education institutions of Ukraine, MNAU has specialization in the field of agricultural technologies, technology of production and processing of animal husbandry products, standardization and biotechnology with corresponding expansion in engineering and energy, economic, management spheres (Official site of Mykolaiv National Agrarian University, 2023). The respondents were representatives of the teaching staff and students of this institution of higher education. The conducted survey sheds light on the attitude of the teaching staff and students, as the main actors, to the educational process in higher education in the conditions of total digitalization.

The electronic questionnaire (which was a Google form) was distributed among MNAU teachers and students of two levels of higher education – 'bachelor' and 'master', through the information system of the university. The survey has been conducted from September 2022 to December 2022 inclusive. The authors received 120 questionnaires, among which 80 represented the opinion of student respondents, 40 questionnaires – the opinion of respondents from the teaching environment.

Respondents commented on issues related to the following areas:

1. Attitudes to distance learning.
2. The presence of digital devices that ensure the connection of respondents to the Internet environment in order to participate in the educational process.
3. Evaluation of online education in the following subcategories: efficiency of information and communication technologies, including the Internet, software security; the impact of digital learning on the level of acquisition of theoretical knowledge and acquisition of practical skills; assessment of online educational communication.
4. Assessment of positive and negative features of the educational process in the digital environment.

When processing experimental data, methods of mathematical statistics (statistical methods) were used. They are used in descriptive statistics (grouping, tabulation, graphical expression and quantification of data), theory of experimental planning (identification and verification of causal relationships between variables). The general population during the research was: students and teachers of Mykolaiv

National Agrarian University. Sample: students of the fourth and fifth years, PhDs and doctors of science. Calculations were performed directly by the authors of the study.

Results and Discussion

Digitalization as a global trend

In recent years, digitization has become an important phenomenon that attracts the attention of both researchers and practitioners. At the macro level, digitalization refers to the changes that institutions and society as a whole undergo as a result of the use of new digital technologies. Vial (2019) analyzed more than twenty definitions of the term 'digitalization' and proposed to define it as a process aimed at improving an object by initiating significant changes in its properties through a combination of information, computing, communication and connectivity technology.

We agree with Curaj, Deca, Pricopie (2018), that digitalization is a series of deep and coordinated changes in culture, workforce and technology that create new educational and operating models and transform the institution's business model, strategic directions and value positions. Thus, it is not only about the quality of changes or technologies, it is related to the fact that technologies and digitalization are becoming a basic necessity for society (Curaj, Deca, & Pricopie, 2018).

In recent years, universities around the world have actively begun to create a digital learning environment that allows students not only to acquire the knowledge and skills needed in their respective subject areas, but also the necessary tools to make a difference (Russo & Mueller, 2013). The COVID-19 pandemic accelerated this process four years ago.

According to Rampelt *et al.* (2019), digitalization affects all activities of higher education institutions. It permeates all processes, places, formats and purposes of teaching, learning, research and work in higher education. Digitization includes the development of new infrastructures and the expansion of the use of digital media and technologies used for teaching and learning, research, support services, administration and communication, as well as for the needs of students and staff in developing their own digital skills for use in the labor market.

Higher education institutions should set clear and specific goals for their digitalization in their management strategies. Universities must have a strategic vision that will allow them to join forces to implement digital initiatives, take advantage of the enormous potential of the field of educational technologies, and offer revolutionary educational opportunities to new generations of students from anywhere in the world. For this, it is important to have professional leadership and a professional

management team that can confidently implement the plans (Rodrigues, 2017).

Distance learning tools, online tools of social networks, open educational resources, massive open online courses, complex learning management systems, etc. are considered as innovations that contribute to equal educational opportunities for all, access to quality educational content and support of lifelong learning (Saykili, 2019).

Digitization of the educational process of higher education institutions: a study from Ukraine

Higher education in Ukraine is represented by institutions of such types as university, academy, institute, college.

The legislation of Ukraine on higher education is based on Constitution of Ukraine and consists of Laws of Ukraine ‘On education’, ‘On Scientific and Scientific-Technical Activity’, this Law and other statutory instruments, international agreements in Ukraine concluded in accordance with the procedure established by law.

According to the law, higher education is a set of systematized knowledge, abilities and practical skills, ways of thinking, professional, worldview and civic qualities, moral and ethical values, other competencies acquired in a higher education institution (scientific institution) in the relevant field of knowledge according to a certain qualification at the levels of higher education, which in terms of complexity are higher than the level of complete general secondary education (On higher education, 2014).

The greatest challenge of today, which has surpassed the pandemic in terms of its consequences for Ukrainian institutions of higher education, is the unprovoked military aggression launched against Ukraine by the Russian Federation. This problem is especially relevant for universities that are located close to the war zone or were located in the occupied territories and were forced to move to another regions of Ukraine.

Innovations related to the active use of digital tools (first of all, distance learning) have been present in higher education for a long time, but due to pandemic and then the war, it has never had such a large audience as in the 2022–2023 academic year.

Open Russian aggression against Ukraine, which resulted in the beginning of the war on February 24, 2022, caused significant material damage to the education sector, including higher education. According to the information of the Ministry of Education of Ukraine (hereinafter referred to as the ‘Ministry’), as of August 1, 2022, 9 colleges out of 606 existing and 7 universities out of 275 were completely destroyed, 71 colleges and 49 universities were partially damaged. The share of destroyed institutions of higher education as of January 1, 2023 is 3.27%,

but with the continuation of hostilities, the number of ruined real estate of higher education institutions will constantly grow. In the regional context, such damages affected institutions of higher education in 14 regions of Ukraine out of 24. Chernihiv region suffered the greatest losses (66.7% of the total number of universities, institutes and academies of various forms of ownership in the region), Kharkiv region (47.8%), Mykolaiv region (37.5%), Donetsk region (33.3%), Zaporizhzhia region (21.4%). Note that in the last two and a half months of 2022, the number of damaged colleges and higher education institutions (together with post-graduate education institutions) increased from 99 to 120, or 1.2 times (Education of Ukraine under military conditions, 2022).

The impact of the war is catastrophic for all spheres of social life in Ukraine, including higher education. Digital innovations in this situation are a means and a tool for mitigating the consequences of war for all participants in the educational process. Therefore, the Ministry of Education and Science of Ukraine makes maximum efforts to ensure the continuity of education in Ukraine, providing access to knowledge and the opportunity to learn to every participant in the educational process. In the conditions of martial law, the ability to organize distance learning through digital technologies and solutions is of critical importance; therefore, the Ministry immediately (already at the beginning of March 2024) launched active work to attract the largest possible number of international partners, Ukrainian organizations and representatives of the business sector to support the digital education in Ukraine. Thanks to the previous experience of organizing distance learning in Ukraine during the pandemic, the work did not have to start from scratch, the creation and modernization of digital content was continued.

The attention of international donors is focused on the development and provision of access to top content for domestic universities. To date, an agreement has been reached with the leaders of the online education market – the Coursera, Udemy and edX platforms – to provide free access to a wide range of courses for Ukrainian students. As part of supporting Ukrainian education, Coursera and Udemy have opened more than 12,000 free online courses for applicants of vocational pre-university and higher education of Ukraine with the possibility of obtaining a certificate of their completion. As of August 1, 2022, more than 22,000 Ukrainian students have already registered on the Coursera platform, having completed almost 30,000 courses.

From the first weeks of the war, the website ‘Education at Risk’ was launched with an online map of Ukraine, which shows the number of destroyed or damaged schools, kindergartens, universities.

The International Renaissance Foundation also joined to help universities in the development of digital learning and the development of educational digital services, which contributed to the creation of a team to support and promote distance learning among higher education institutions. Together with the Ministry of Education and Science, the foundation team is working on the technical component of supporting universities in terms of access to various platforms, holding webinars for higher education representatives responsible for the digital component of education. In collaboration with Tech ToTheRescue, the team is developing a web portal to collect information about the possibilities of using online platforms, as well as successful examples of the use and adaptation of content by Ukrainian universities in the learning process.

Success in the era of digitalization in higher

education can only be achieved through institutional conviction in the need to use the momentum of the digital revolution and the strong commitment of students, teachers, researchers, staff and managers. This process involves the growth of digital infrastructure, the development of the skills of academic staff to use digital methods in teaching and improving the digital skills of their students, as well as other important challenges, among which, we emphasize knowledge leadership, pedagogical and learning changes (Kaputa, Loučanová, & Tejerina-Gaite, 2022).

The results of the survey of the teaching staff and students of Mykolaiv National Agrarian University.

The qualitative characteristics of the respondents, including their gender composition, the level of higher education obtained by students, and the qualitative composition of teachers who provide the educational process, are given in Table 1.

Table 1

Qualitative characteristics of MNAU respondents-representatives who took part in the study

Study level				Teaching staff			
Bachelor		Master		Candidates of Sciences		Doctors of Science	
women, %	men, %	women, %	men, %	women, %	men, %	women, %	men, %
83.72	16.28	50.94	49.06	63.85	36.15	42.37	57.63

Women made up about two-thirds of the sample of 120 respondents (Table 1). Among teaching staff, there are 76.6% more women than men, among those teachers who have the scientific degree ‘Candidate of Sciences’. Men have a numerical advantage of 36.01% among teachers with a Doctor of Science degree. Students of bachelor programs were represented in the sample by a larger share compared to students of master programs.

Mykolaiv National Agrarian University is in a state of active online education for the fourth year, starting with the second semester of the 2019–2020 academic year, when the emergence of the COVID-19 pandemic caused a sharp change in the format of education from face-to-face to distance learning. While developing the study, we were interested in how teachers and students perceived online learning after the first year of practical experience of distance learning (2019–2020 academic year) and after the fourth year of distance learning (2022–2023 academic year). The evaluation of this criterion was carried out from a gender point of view, which, in our opinion, in addition to the professional reaction, made it possible to highlight the psychological state and emotional background of the respondents in which they were in the specified period.

The evaluation of the questionnaire data made it possible to establish that the level of support for

the practical application of distance learning among students was high from the 2019–2020 academic year: 80.1% – among female respondents, 93.2% – among male respondents.

Over four academic years, this level has not changed much among male students, but has significantly increased among female students (up to 96.4%) in the 2022–2023 academic year.

This is due to the number of students who, in connection with the beginning of Russia’s military aggression, were forced to go abroad or are internally displaced persons. The number of such students, according to various estimates, for the city of Mykolaiv, which is a front-line city that was under daily shelling for almost 9 months, is approximately 84%. Among the students who have moved, the lion’s share is made up of female students, since the male students are persons subject to conscription.

Among the teaching staff, the level of support for the use of distance learning was low in the 2019–2020 academic year: only 7.6% of female teachers and 13.3% of male teachers positively perceived the total use of this form of education. At the same time, during four years, the level of support for teachers has been constantly growing, practically increasing its positive indicators by 2 times per academic year. The biggest jump in the reassessment of the role of distance learning in a positive direction occurred among female

teachers (from 7.6% to 93.0%) in the second semester of the 2021–2022 academic year, when a large part of them had to leave Mykolaiv in March 2022 year, when there were fierce battles for the city.

In terms of technical support, laptops are the digital devices most often used by students to participate in the educational process (58.8%), followed by smartphones (37.6%), the share of other devices was 3.6%.

It is possible to conclude that the most demanded hardware for the participation of teachers in the educational process is a laptop (58.8%), the same as among students. 14.1% of respondents – teachers used a smartphone, and 2.4% – other gadgets. Among the

surveyed respondents, there were such teachers who indicated the parallel use of two gadgets at the same time as an additional answer option.

Very few MNAU students and teachers had problems with online learning due to the lack of digital equipment suitable to connect to the learning process and perform duties. This statement applies to the respondents. The most common problems were poor quality of the Internet connection or failure on the respondents' digital devices.

The final part of the study in the Google form offered to respondents was devoted to determining the advantages and disadvantages of digitalization of the educational process. Its results are presented below.

Table 2

Advantages of digitalization of the educational process in higher education according to the opinion of respondents – MNAU students, %

Category	Bachelor	Master
Adequate security of software for online learning	64.2	82.1
Training in comfortable conditions	78.9	61.2
Quick collection of necessary information, easy nature of its analysis and systematization	86.3	89.5
Ability to learn how to select information and evaluate it critically	67.3	88.1
Development of new knowledge and skills, their application based on previous experience	59.0	90.0
Faster communication and the possibility to work creatively and communicate with foreign students and teachers	62.4	84.8
Balance between digital and real communication	17.2	32.7
Less material costs in distance learning compared to face-to-face learning	96.0	93.8
More time for social contacts through the Internet	91.3	87.4

Source: developed by the authors (Vindača, 2020).

Respondents among students consider the security of the software of the platforms used one of the main advantages of implementing learning in a digital environment. At the same time, master students have more confidence in software for online learning (82.1%) than bachelor students (64.2%). The technical solution of online learning at MNAU is provided by a combination of the capabilities of the Moodle learning management system for the implementation of an asynchronous knowledge acquisition mode and video conference software products (Google Meet, Zoom) to work in real time format. An important step for the university was the implementation of the policy of creating and providing a unified electronic communication space. The launch of the Moodle

e-learning platform at MNAU took place in 2012, and would not have been possible without the quality management of this process, in particular with regard to the professional and psychological support of the teaching staff on the way to the digitalization of the educational process, which was provided by a multi-vector system of training and development of digital competences of teachers and students.

The vast majority of respondents–students highly appreciated the ability to collect the necessary information quickly, the easy nature of its analysis and systematization. For masters, the opportunity to develop new knowledge and skills is extremely important – 90.0% of respondents, at the same time, bachelors thought little of this advantage – 59.0%.

Also, the possibility of communication and creative cooperation with foreign students and teachers was more important for masters (84.8%) than for bachelors (62.4%) (Table2).

Important indicators of the positivity of innovative changes in the educational environment for students were the possibility of reducing material costs with distance learning compared to face-to-face learning (on average – 95.0% for bachelors and masters); the opportunity to study in comfortable

conditions (on average – 70.1% for bachelors and masters); the possibility of increasing time for social contacts through the Internet (on average – 89.3% for bachelors and masters). Students adequately identified the possibility of a balance between digital and real communication as the least tangible advantage for themselves, since both bachelors (17.2%) and masters (32.7%) understand that achieving harmony between the time spent in the digital environment and the time of communication in the real world is very difficult.

Table 3

Disadvantages of digitization of the educational process in higher education according to respondents–MNAU students, %

Category	Bachelor	Master
Failures in the operation of information and communication technologies, including the Internet	100.0	100.0
Inability to have the necessary technical support for quality participation in online learning	23.4	9.1
Inability to create an appropriate space for discussion, as in the case of face-to-face teaching during lectures and seminars	46.2	68.9
Lack of personal communication with teachers, which is necessary for explaining the curriculum	73.6	51.7
Lack of personal communication with fellow students	89.1	80.1
Specific individual psychological traits that cause a student problems with online learning	9.4	4.7

Source: developed by the authors (Vindača, 2020).

Both bachelors (100%) and masters (100%) attributed failures in the operation of information and communication technologies, including the Internet, to the most problematic negative consequence of digitalization of the educational process. This problem turned out to be extremely acute and sensitive for both students and teachers against the background of massive missile attacks on the energy infrastructure of Ukraine carried out by the Russian Federation. They began on October 10, 2022, take place daily throughout the territory of Ukraine and will continue until the end of Russian military aggression. This makes the educational process unstable and dependent on the presence of the Internet, an air warning signal and electricity.

The question of real communication with fellow students is sensitive for students (89.1% – for respondents-bachelors, 80.1% – for respondents-masters) (Table3), since the war led not only to the large-scale introduction of distance learning, but

also to the departure of more than 256 thousand students from Ukraine, and their internal movement to safer regions in an unknown number, especially from such large front-line cities as Kharkiv, Mykolaiv, Zaporizhzhia, Sumy, Chernihiv, Kherson (Education of Ukraine under military conditions, 2022). Also, among the most negative consequences of digitization of the educational process, students noted the lack of personal communication with teachers (on average – 62.6% for bachelors and masters) and the lack of appropriate space for discussing educational material (on average – 57.5%). An analysis of the questionnaires among the interviewed representatives of the MNAU faculty made it possible to determine that the most significant advantage of the digitalization of the educational process at the university is the unlimited resources for implementing distance learning (94.5% for Candidates of Science, 88.2% for Doctors of Science).

Table 4

The advantages of digitalization of the educational process in higher education according to the opinion of the respondents – MNAU teaching staff, %

Category	Candidates of Science	Doctors of Science
Adequate security of software for online learning	73.4	81.6
Training in comfortable conditions	86.2	89.8
Quick collection of necessary information, optimization of its classification, structuring, analysis and systematization	93.6	91.3
Increasing the level of technological competence	85.5	87.3
Connection of theory and practice	68.2	47.1
The possibility of cooperation and communication with foreign colleagues	70.8	90.6
Individual approach to learning	92.6	89.5
Unlimited resources for the implementation of distance learning	94.5	88.2

Source: developed by the authors (Vindača, 2020).

Also, a significant advantage for the above-mentioned respondents is the high rate of collection of the necessary information, effective tools for its optimization, classification, structuring, analysis and systematization (93.6% for Candidates of Sciences, 91.3% for Doctors of Sciences). Conducting training in comfortable conditions is important for 86.2% of Candidates of Sciences and for 89.8% of Doctors of Sciences. On average, 77.5% of the MNAU teaching staff are involved in the security level of software for online learning. 85.5% of Candidates of Sciences and 87.3% of Doctors of Sciences are looking for an opportunity to improve their technological competence (Table 4).

First place among the negative consequences of the digitalization of the educational process in higher education, according to the teaching staff of MNAU, as well as among the students, are problems and failures in the operation of information and communication technologies and the Internet connection. This was indicated by 100% of all respondents. The same negative impression is caused by the long process of digitizing educational materials, which teachers are forced to carry out mainly outside of working hours. 34.69% of respondents among Candidates of Science and 28.78% among Doctors of Science consider it necessary to improve their level of information and communication competence.

Representatives of the teaching environment noted two problems of a psychological nature: fear of making mistakes when conducting online classes (highly typical for Candidates of Science – 95.1%, and

for Doctors of Science – 93.5%); individual rejection of online teaching (10.4% of Candidates of Science, 6.26% of Doctors of Science) (Table 5).

Significant disadvantages of online learning also include the impossibility of creating an appropriate space for discussion, as in the case of face-to-faceteaching at lectures and seminars (on average – 88.6% of respondents); lack of personal communication with students, which is necessary to explain the curriculum (76.6% of respondents).

Given the above, it can be argued that, despite the many opportunities that digital technologies open up for the educational process in higher education in Ukraine, there are also risks associated with their use, namely: the dependence of the educational process on the operation of the Internet network and software; emotional and psychological overload, caused by the duration of the digitization of significant arrays of educational material in teachers, and in students by the assimilation of this material and the lack of communication; limited practical training and the formation of communicative competencies, etc. All these negative aspects are in the active focus of attention of the administration, each of the participants in the educational process, as well as the psychological department of the university. An important tool that allows you to receive feedback from applicants and teaching staff regarding the educational process in a higher education institution are sociological surveys regularly conducted at MNAU using resources such as Google forms, Telegram, Viber, e-mail, etc.

Table 5

Disadvantages of digitalization of the educational process in higher education according to the opinion of the respondents – MNAU teaching staff, %

Category	Candidates of Science	Doctors of Science
Failures in the operation of information and communication technologies, including the Internet	100.0	100.0
Fear of making a mistake	95.1	93.5
Inability to create an appropriate space for discussion, as in the case of face-to-face teaching during lectures and seminars	87.5	89.7
Low level of information and communication competence	34.7	28.8
A long process of digitization of educational materials	100.0	100.0
Lack of personal communication with students, which is necessary for explaining the curriculum	73.3	79.9
Specific individual psychological traits that cause the teacher problems with online teaching	10.4	6.3

Source: developed by the authors using (Vindača, 2020).

Conclusions

The study conducted by the authors allows us to draw the following conclusions:

1. It has been established that digitalization is a series of profound and coordinated changes in culture, workforce and technology that create new educational and operational models and transform the higher education business model, strategic directions and value positions.
2. The main challenges faced by higher education institutions of Ukraine in the digitalization of the educational process are: the lack of modern professional leadership and a professional management team in higher education, which understands the importance of digital transformation of the educational system; formation of a strategic vision for the implementation of digital initiatives; definition in management strategies of clear and specific goals for the digitalization of the educational process at the university; the availability of tools to use the significant potential of the sphere of educational technologies; introduction of mechanisms for the implementation of revolutionary educational opportunities for new generations of students from anywhere in the world. The challenges facing higher education have significantly accelerated the digitalization of the educational process. Large-scale application of educational digital technologies is inevitable for the transformation of higher education. Now competitiveness in the market of educational services is determined precisely by the openness and readiness of an institution of higher education for the new, the ability to adapt and change in a timely manner in accordance with today's realities.
3. The greatest challenge, which has surpassed the pandemic in its consequences, for Ukrainian institutions of higher education is the unprovoked military aggression launched against Ukraine by the Russian Federation. This problem is especially relevant for universities located near the war zone or located in the occupied territories and forced to move to another regions of Ukraine.
4. Open Russian aggression against Ukraine caused significant material losses in the field of higher education. 1.5% of colleges and 2.5% of universities were completely destroyed, 12% of colleges and 17.8% of universities were partially damaged. Regionally, such damage affected institutions of higher education in 14 regions of Ukraine out of 24. The attention of international donors, helping Ukrainian higher education to survive the war and preserve the educational system, is focused on the development and provision of access to top content for domestic universities. To date, an agreement has been reached with the leaders of the online education market – the Coursera, Udemy and edX platforms – to provide free access to a wide range of courses for Ukrainian students.
5. In the course of conducting a survey of the teaching staff and students of MNAU in the context of their assessment of the level of digitization of the university, it was possible to establish the attitude

of the respondents to online learning, technical means of participation in the educational process, the advantages and disadvantages of digitalization of the educational system of the higher school for students and teaching staff.

Mykolaiv National Agrarian University is in a state of active online education for the fourth year, starting from the second semester of the 2019–2020 academic year, when the emergence of the COVID-19 pandemic caused a sharp change in the format of education from face-to-face to distance learning, and until now. Over the course of four academic years, the level of attitude towards distance learning was high among male respondents (both students and teachers), remained almost unchanged among male students and increased among male teachers; but increased significantly both among female students and female teachers in the 2022–2023 academic year, as a significant part of them became displaced persons in the second semester of the 2021–2022 academic year. In terms of technical support, laptops are the digital devices most often used by both students and teachers to participate in the educational process, followed by smartphones and other devices.

6. Among the advantages of digitization of the educational process, respondents attributed: security of software for online learning; quick

collection of necessary information, easy nature of its analysis and systematization; the opportunity to learn how to select information and evaluate it critically; development of new knowledge and skills, their application based on previous experience; quick communication and the opportunity to work creatively and communicate with foreign students and teachers; increasing the level of technological competence; connection between theory and practice; individual approach to learning; training in comfortable conditions; lower material costs for distance learning compared to face-to-face learning; increasing time for social contacts through the Internet.

7. Disadvantages of the digital transformation of the educational environment of the Ukrainian higher school were: failures in the operation of information and communication technologies, including the Internet; impossibility to have the necessary technical support for high-quality participation in online learning; low level of information and communication competence; a long process of digitizing educational materials; the impossibility of creating an appropriate space for discussion, as in the case of face-to-face teaching at lectures and seminars; lack of personal communication with teachers and fellow students; fear of making a mistake; specific individual psychological traits that cause problems with online learning.

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