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*Pandemic and Digital Transformation.
Challenges to Higher Education*

Pandemia a transformacja cyfrowa. Wyzwania dla szkolnictwa wyższego

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ABSTRACT

The article considers the consequences of the COVID-19 pandemic for higher education in Ukraine and in the world. The results of research by the International Association of Universities, the European University Association, the European Association for International Education are analyzed. The impact of the pandemic on teaching and learning is determined. International academic mobility and cooperation, as well as the financial situation of higher education are described. In addition, difficulties, fears and challenges faced by higher education institutions around the world during the corona crisis, which require swift and adequate action, are presented. The main part of the article shows the results of a survey of teachers and students of higher education institutions of Ukraine, devoted to the analysis of problems and challenges faced by students in the transition to distance learning, as well as new productive opportunities created by the online format. The main problems faced by the main participants in the educational process include the quality of teaching and organization of the distance learning process, the growth of the workload of teachers and students, technical and financial problems. The results of the survey show both the assessment and satisfaction with the measures already taken by higher education institutions to ensure quality and effective distance learning, and help to understand the next productive steps to be taken to expand teaching and distance learning opportunities and access to learning opportunities during life. Educators' assessment of the opportunities and benefits created by the distance learning format demonstrates the motivation of teachers to improve their own skills and abilities, mastering the new tools required by the distance learning format. In the case of students, such advantages become first of all economical ones, e.g. expansion of opportunities for a combination of study and work as well as economy of time and means.

Keywords: digital technologies in education; distance technologies; digitalization of education; blended learning; pandemic; COVID-19; innovations in higher education

INTRODUCTION

Facing the strongest epidemiological threat, the education systems of all countries faced a precedential challenge. Approximately 1.6 billion learners around the world in 2020 switched to remote teaching and distance learning. In the situation of a forced mass transition from the traditional format (full-time education in traditional classes) to distance forms of education, the so-called “new reality” began to actively form.

Digitalization of education is one of the priority directions of educational policy in Ukraine. All educational systems were forced to make difficult decisions and urgently carry out the transfer of their activities online, in fact, having neither a choice of alternative work options nor the possibility of postponing the implementation of these steps. The pandemic has unprecedentedly affected the educational sphere, the development of innovations, and the digitalization of education in the world (Nychkalo, Lukianova, 2021; Lazarenko, Hurevych, Kizim, 2021). The article is aimed at predicting the development of distance and digital technologies in Ukrainian education. In the process of this study, analytical and system approaches, as well as methods of pedagogical forecasting, were used; materials in the field of digitalization and distance technologies and their application during the pandemic in education in different countries of the world were studied. The article analyzes educational trends in Ukraine and abroad, predicts probable prospects for transformations of the Ukrainian educational system. The novelty is to study the impact of the epidemiological situation on global education, as well as on distance learning and digital technologies.

Studies of the challenges faced by higher education during the COVID-19 pandemic are already being carried out by the International Association of Universities (IAU), the European University Association (EUA), and the European Association for International Education (EAIE). Thus, the results of the first Global Survey of the International Association of Universities indicate that the COVID-19 pandemic has affected teaching and learning in almost all higher educational institutions of the world, in particular, two-thirds of them reported that there was a replacement of face-to-face to distance learning and teaching. According to UNESCO, due to the coronavirus, schools and universities were closed in 165 countries of the world, which directly affected more than 1.5 billion students, or 87% of the world's learners. Another type of estimation of educational cost of the pandemic includes the future economic costs for individuals and for society (Hanushek, Woessman, 2020). The World Bank estimated a loss of \$10 trillion dollars in earnings over time for the current generation of students (World Bank, 2020). Ukraine has closed all educational institutions to visit from March 12, 2020 when the first cases of the disease appeared. In accordance with the Resolution of the Cabinet of Ministers of Ukraine no. 211 of 11 March 2020, quarantine was

provided throughout the country, and applicants were banned from attending educational institutions at all levels. In the first weeks of the educational quarantine, there was a lot of hard work of the authorities to organize distance learning, the wait-and-see silence of critics, the anxiety of parents, the joy of students who perceived the changes as a kind of vacation, and the mobilization of confused teachers. Of course, at the same time, in all countries, there was a lack of readiness for distance learning among both teachers and students. Full readiness for change was shown only by groups that promoted relevant suggestions in the market of educational and digital services – platforms, services, distance education resources for students of various groups. These funds seemed useful and convenient in conditions of required isolation, and the relevant ministries recommended proven resources to educational institutions and assured the media of the readiness of the educational system to switch to a required mode of operation. Television and the press, in turn, created a picture not only of the full functioning of the system in a new form, but also of the convenience of such, which corresponded to the important task of conducting educational work to prevent panic and reduce the level of social discontent. The pandemic has created the preconditions for a sharp breakthrough in digitalization. After the closure of schools, universities, and educational hubs, the educational process was organized in digital format, and hence there appeared distance lessons, online services of a tutor, facilitator, etc.

The purpose of this article is to study the prospects and possible consequences of the global transition to distance learning, the basis of which is the analysis of form usage in Ukraine and abroad during the pandemic.

METHODS AND RESULTS

We used the following research methods: survey, observation, comparison, generalization and systematization of practical experience. The main context of the COVID-19 pandemic is to find out the system of challenges faced by higher education institutions of Ukraine and all over the world. An online survey of teachers and students of higher education institutions of Ukraine was conducted. An example of a student questionnaire on this topic is a survey of first-year students of the Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University; 45% of them recognized online learning as more interesting than traditional classes. More convenient distance learning was recognized by 52%. Assessing their responsibility for studying, 50% of respondents noted its growth and only 25% – a fall. A similar survey was conducted among graduate students – 45% of respondents had a positive attitude to distance learning, only 10% had a negative attitude. The “rating” of problems for both teachers and students is headed by technical ones (42% of teachers and 40.2% of students noted them), the following are the problems of changing the volume of educational workload (32.3% and 40.1%,

respectively), problems (33.8% and 35.7%, respectively) and the organization of the educational process remotely (31.2% and 36.2%, respectively).

The unprecedented global educational situation, the sudden jump in the digitalization of society and the ambiguity of assessments of what is happening concretize the question of the powerful impact of the consequences of COVID-19 on the development of education in the near future: what of the today's experience will enter the daily practice of the pedagogical process tomorrow – how will distance learning affect the usual classroom learning after the corona crisis? In many countries, school closures meant a transition to fundamentally different technologies that are not accepted in mass education – i.e. to distance and digital technologies. In the current conditions of technological progress, rapid political decisions and pedagogical uncertainty, they are closely intertwined and they provide an opportunity to preserve the educational process with a total rejection of classroom training. According to the decree on distance learning no. 466 dated 24 April 2013, distance technologies are those educational technologies that are implemented mainly with the use of information and telecommunication networks with distance interaction of students and teachers. The concept of digital technologies is related to them, but refers to long-established information and communication technologies. Transition to an online learning model or interaction with chat and e-mail means the use of digital technologies, but since the pedagogical process is carried out exclusively distantly, it is not just about digital means, but about distance learning. It is a learning technology based on the use of digital technology to support the interaction of the trainer and the trainee at a distance (Graham, 2018).

Distance learning and digitalization have been used in education for a long time; the question is to what extent they will change education now. The directions of transformation have been outlined by experts since the beginning of the pandemic: whether this challenge will make students treat online education better than classroom education; whether the number of teachers who recognize the value of online learning and are ready to use it will increase; whether the understanding and ratio of classroom and distance learning will change; whether the expected decline in the quality of remote teaching will cause a skeptical attitude towards learning using digital technologies in general (while the reason for the fall may be both the negative experience of students and teachers, and the lack of digital competencies of teachers – Lederman, 2020). However, due to the lack of a common, widely understood, pedagogical framework for online teaching and learning (Picciano, 2017), it is not clear what additional pedagogical dimensions need to be considered in an online situation.

The majority of respondents (83.6% of teachers and 77.9% of students) pointed out the activity of their own higher education institutions to ensure distance learning. In particular, we are talking about the launch of distance learning platforms, the presence of which was reported by 78.4% of the teachers surveyed.

Among other measures taken by academic institutions, teachers called for the possibility of organizing various forms of trainings (courses, trainings, webinars, seminars) for teachers and (less often) students, the purchase of equipment to ensure the conduct of online activities, the conclusion of contracts and the acquisition of access for the wider use of tools offered by online platforms (Zoom, Google Meet, Microsoft Teams, etc.), organizational and methodological support for the process of distance learning, permanent support and feedback. Only 7.8% of teachers and 5% of students noted the lack of such measures.

At the same time, the results of the survey show that the launch of their own remote platforms does not indicate their effectiveness and active use. Among the platforms most commonly used in distance learning, the leaders for both students and teachers are Zoom (80% and 66.9%, respectively) and Google Meet (58.9% and 47.2%, respectively). Instead, only 21.9% of the surveyed teachers and 17.8% of students use their own platform, which probably indicates either problems in its work or insufficient functionality in providing distance learning. The assessment of the opportunities and advantages created by the distance learning format is also slightly different for teachers and students.

Among the advantages, teachers first of all note the mastery of new tools that provide distance learning platforms (70.6%), wider opportunities for the use of visualizations that contribute to better assimilation of material (48.7%), the possibility of repeating lecture materials in the recording (46.5%), work in more convenient conditions (43.1%). According to students, however, the main advantages associated with distance learning include: saving time and money (59%), the ability to work in more convenient conditions (57.9%), access to video/audio recording of lecture materials (50.3%) at any convenient time, which expands the opportunities for combining study and work (40.3%), which is especially valued in the conditions of economic crisis.

Based on the observation of current trends in education, the World Economic Forum predicts the following possible changes: 1) in the course of forced pedagogical experiments on the ground, amazing innovations will appear (traditional classroom training will be complemented by new methods – from live broadcasts to experiments with virtual reality); 2) partnership between the private and public education sector will increase (activation of various stakeholders in the further use of digital technologies – from publishers and television to suppliers of technologies and telecommunications networks); 3) digital inequality will increase (the quality of education will largely depend on access to digital technologies) (Tam, El-Azar, 2020).

Foreign experts express fears that the corona crisis will lead some educational institutions, primarily private ones, to closure or merger due to a drop in demand for their services. These fears are heightened by the fact that the pandemic is taking place against the backdrop of an economic recession, and it is

well known from the 2008 crisis that this leads to severe revenue cuts, which are most easily implemented through staff closures and layoffs. Nevertheless, it can be argued that in higher education, the problem of COVID-19 will create favorable conditions for the development of the didactic sphere. American education manager Joshua Kim makes three predictions “how our post-pandemic pedagogy will change in the higher education ecosystem” (Kim, 2020): the development of blended distance learning, online education, and related partnerships. It is worth considering his theses in more detail.

1. Leap in the development of blended learning and distance education. The author suggests restructuring the content of higher education programs with the help of mixed technologies: theoretical information will move into the segment of homeschooling, the experience of which teachers have already gained when moving the content of their training courses to the Internet, “and precious classroom time will be more productively used for discussions, debates and managed practice” (Kim, 2020).
2. Online education as a strategic priority of all educational institutions. Prior to quarantine, not all educational institutions used the appropriate funds; where these opportunities were applied, the degree of importance of online education in the strategic planning of the development of the institution differed. However, after the pandemic, this importance will increase everywhere, and it will be widely recognized as core in institution development programs due to its “institutional sustainability and academic continuity” (Kim, 2020). Moreover, previously decentralized distance education will be centralized within the framework of the planning of the work of one university and integrated into the existing structures of the educational process management.
3. Another forecast is the rethinking of existing and possible partnerships in the field of online program management. Institutions that depend on online program management providers have found it more difficult to make the transition to distance learning, therefore, in the future they will have to take into account this deficit by investing in digital courses, resources, etc. (Kim, 2020).

The required abandonment of classroom instruction has already been dubbed the beginning of a revolution in higher education. Based on this, some researchers consider online learning not as a possible, but as an inevitable prospect. They explain that due to the crisis caused by the pandemic, innovations are quickly introduced into universities, which at other times would have taken years, overcoming administrative obstacles and personnel resistance (Kohut, 2020). The academic community is trying to find the benefits that this crisis can bring to education. However, there are opposite estimates. Some people doubt that there will be a revolution in university education, although the use of distance learning will increase significantly, and the negative attitude of teachers towards this technology will also decrease (the crisis has shown them advantages of this form of teaching).

At the same time, all experts recognize that higher education will no longer be the same. The pandemic has created an unexpected and unique opportunity for the ubiquitous and spontaneous introduction of digital technologies into learning. What had previously been actively discussed, suddenly became an educational reality within a couple of days, without prior preparation and resistance from opponents of digitalization – the authorities recognized the threat to the life of their nations so highly. In fact, in many countries, an unexpected large-scale experiment with the digitalization of education was launched, the positive results of which will be fixed in the system.

At the university, the real interaction of subjects is very important. Teachers who recorded video lectures were faced with the “problem of emptiness” – the physical absence of the listeners – and very few, by virtue of their artistic abilities, were able to hold it in an empty room and look at the camera lens as if they were in front of a habitually full auditorium. In a lecture, a good teacher does not hold on to his notes and turns the monologue into a polylogue, thereby seeing feedback, reaction to his words and guiding the thought process of students. Video lectures and even online lectures (where interaction is extremely limited) are not comparable to classroom lectures in terms of the possibilities of this live communication. The same applies to the discussion of students, the full online organization of which is impossible. It is the direct interaction of the teacher and the student that is the condition for quality education. It explains, for example, the difference between the effectiveness of full- and part-time education. Acknowledging the contrary or proving the equivalence of distance education calls into question the very need to maintain the entire infrastructure of the educational system, if its funds can be limited only by software, a computer and a distant teacher.

Reflections on distance interaction in education, as well as the practice of quarantine weeks, lead to the conclusion that if the form of distance learning (in case of extreme necessity or hopelessness) is acceptable, then in relation to education its resources are scanty and the use of artificial intelligence, perhaps, is completely impossible.

After the pandemic, digital technologies will be more actively promoted in educational practice. The question is within the boundaries of their implementation and further combination with distancing: in the pursuit of building a digital economy, they should not automatically destroy the important and positive aspects of education. And the measure of these boundaries should be the values of education – the established absolute characteristics of educational systems that underlie their goals, content, principles, forms and methods of functioning.

Undoubtedly, digitalization is useful for education. There are a number of interest groups that actively promote the digitalization of education and are supported by foundations, grants and enterprises for the production of related technologies. It is no coincidence that large IT companies are investing in education. Apple funds about 400 educational institutions around the world. The idea of digital

schools is actively promoted in the West. For example, in the Netherlands, there are so-called Steve Jobs Schools, whose practice is built on the combination of individualization and digitalization of education in the conditions of primary school. Steve Jobs Schools focus on learning through iPads, in the work with which children spend half of the school day. Responding to the demand of the time, business is actively bringing its technologies to schools.

At the same time, the Western media have repeatedly reported on the opposite trend in Silicon Valley: programmers and top managers of IT companies prefer schools with traditional and health-saving learning technologies for their children. Very popular in the Valley are, for example, Waldorf schools, the ideology of which is incompatible with computers. In this regard, there are even forecasts that analog, “digitless” schools will turn into elite ones as technology enters education. Similarly, the development of the university sector was envisaged, also due to the discriminatory nature of distance technologies: the consolidation of online learning is associated with the suggestions of distance learning, which will lead to the acquisition of an elite status by classroom teaching and, consequently, to a gap between students.

Aspects of the negative impact of digital devices are confirmed by psychologists. Thus, the German neuropsychologist and psychiatrist Markus Spitzer proves that they fully contribute to the continuous education of adults, but are harmful to children and shift the emphasis from knowledge to pleasure.

Precisely because computers, laptops and smartboards do mental work for us, they are not suitable for learning. Learning involves independent mental work: the more actively and deeply the brain processes information, the better it will be assimilated. There is not enough evidence to claim that modern digital technology will improve learning in school. (Spitzer, Furtner, 2016)

On the contrary, there are studies that have found that the use of these technologies in the classroom does not correlate with improvement of students’ educational outcomes, but can have negative effects on academic results (Adnan, Anwar, 2020). It does not follow from the warnings of psychologists and the educational strategies of IT producers that computers are extremely harmful to children and education (Bilton, 2014).

Education has its interest groups, its supporters and opponents. Likewise, it is obvious that the sharpness of criticism will not interfere with this process due to its global nature – both geographically and socio-economically. Digital technologies, as the worldwide quarantine has shown, can be a good help for educational institutions. It is important to remember that they represent a comfortable, but not the primary means of learning, and it is important to consider the problems and consequences that their overuse entails. According to educational standards, the priority should be the independent work of the student.

Therefore, digitalization should take place against the background of careful scientific and methodological support, designed to find ways of integration of

digital technologies in institutions with the optimal prevention of their possible negative impacts. The task of reducing harmful risks definitely involves limiting the use of digital technologies to those objectively necessary and convenient.

CONCLUSIONS

The COVID-19 pandemic, which has affected various spheres of public life, has required educational subjects – both senior administrative management and teachers and students – to quickly adapt to changes that are long overdue. Such adaptation, in particular the transition to distance learning, has identified a number of problems, the solution of which both requires the active involvement of teachers and students, and sets specific tasks for higher education institutions. The conducted study confirms that quarantine restrictions related to the prevention of the global COVID-19 pandemic have radically changed the functioning of universities and led to the need to strengthen financial stabilization measures not only in Ukraine, but throughout the world.

The global pandemic and economic crisis recognize the necessity to take into account the dynamics of processes, the simultaneous digitalization of teaching and learning, support for the quality of education and research work. The results of the study show that classical universities were the most prepared for the transition to distance and mixed forms of education. Some higher education institutions have their own platforms for distance learning, others had to quickly introduce such systems, which created an additional burden on all participants in the educational process. At the same time, higher education institutions require significant funding to ensure remote work in all areas of activity. However, this transition demonstrated the numerous risks and difficulties of using digital technologies, as well as the shortcomings of distance learning technology in comparison with the classroom. Moreover, some have used the possibilities of digital technologies, while others have limited themselves to distance learning technologies, minimizing the use of technology and digital resources. The subjective factor has always been very powerful in inhibiting innovation, ensuring the conservative nature of the system (Lo, Han, Wong, Tang, 2021).

Digital technologies will be recognized as a modern and promising tool that can not only expand the educational opportunities of all categories of students, but also profitably modernize existing classroom learning technologies with adequate management by the teacher, taking into account the understanding of the negative effects of this technology (König, Jäger-Biela, Glutsch, 2020). It is worth noting the important conditions for the digital modernization of educational institutions, namely the development of digital resources, informing teachers about the possibilities of these resources, improving their skills in the IT direction, but, at the same time, providing them with freedom of methodological self-expression and

freedom to choose the means of implementing the pedagogical process in an educational institution.

Difficult situations and challenges are not only fears, but also opportunities, namely opportunities to rethink, develop, learn, look for new and improve existing tools and means of teaching and learning. Students and teachers' understanding of both the problems and opportunities that create the distance learning format will help higher education institutions of Ukraine achieve greater flexibility in learning under new conditions, promote the development of innovative pedagogical methods and stimulate the implementation of measures that meet the today challenges. In order to adapt to the prolonged pandemic, universities will need flexible and reliable models of education that will allow them to continuously adapt to different stages of the "new familiar". The COVID-19 pandemic has enhanced and intensified long-term pedagogical trends, creating a natural experiment in which numerous innovations are tested and evaluated. The first signs indicate that many innovations used during the pandemic will be useful for students after the crisis.

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ABSTRAKT

W artykule analizie poddano konsekwencje pandemii COVID-19 dla szkolnictwa wyższego w Ukrainie i na świecie oraz wyniki badań Międzynarodowego Stowarzyszenia Uniwersytetów, Europejskiego Stowarzyszenia Uniwersytetów i Europejskiego Stowarzyszenia Edukacji Międzynarodowej. Określono m.in. wpływ pandemii na nauczanie i uczenie się, a także scharakteryzowano: międzynarodową mobilność akademicką i współpracę; sytuację finansową szkolnictwa wyższego; trudności, zagrożenia i wyzwania, przed którymi stoją instytucje szkolnictwa wyższego na całym świecie podczas ograniczeń pandemicznych. Ponadto przedstawiono wyniki ankiety przeprowadzonej wśród nauczycieli i studentów ukraińskich uczelni wyższych, poświęconej analizie problemów i wyzwań stojących przed uczelniami w procesie przejścia na kształcenie na odległość, a także nowych możliwości, które oferuje format online. Główne problemy, z którymi borykają się uczestnicy procesu edukacyjnego, obejmują: jakość nauczania i organizację procesu kształcenia na odległość, wzrost obciążenia pracą nauczycieli i uczniów oraz problemy techniczne i finansowe. Wyniki badania z jednej strony pozwalają dokonać oceny i określić stopień zadowolenia z działań już podjętych przez instytucje szkolnictwa wyższego w celu zapewnienia wysokiej jakości i skutecznego kształcenia na odległość, a z drugiej strony pomagają zrozumieć kolejne kroki, które należy podjąć w celu rozszerzenia możliwości nauczania i kształcenia na odległość oraz dostępu do możliwości uczenia się w ciągu życia. Dokonana przez nauczycieli ocena możliwości i korzyści wynikających z kształcenia na odległość pokazuje motywację nauczycieli do doskonalenia własnych umiejętności i zdolności oraz do opanowania nowych narzędzi wymaganych przy zdalnym kształceniu. W przypadku studentów korzyści z takiej formy nauki są przede wszystkim ekonomiczne, np. rozszerzenie możliwości połączenia nauki i pracy oraz ekonomia czasu i środków.

Słowa kluczowe: technologie cyfrowe w edukacji; technologie na odległość; cyfryzacja edukacji; blended learning; pandemia; COVID-19; innowacje w szkolnictwie wyższym