

Distance Learning During the COVID-19 Pandemic: The Experience of Ukraine's Higher Education System

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Abstract: The COVID-19 pandemic has created a new paradigm of 'life in social distancing', which in its turn has had a massive impact on education. Continuing education delivery through alternative channels of instruction became a top priority for education institutions aiming to minimize impacts of the pandemic on education. Most universities shifted from conventional, face-to-face instruction to distance teaching and learning, which meant that teaching approaches, tools of assessments, and ways of teacher-student communication had to be modified. Since the pandemic wake, various global educational organizations have carried out studies to identify threats and potential opportunities for higher education within and beyond the pandemic. Some attempts to analyze the experience of the Ukrainian higher education system transition to mass distance instruction have also been made. However, this research was limited by a territorial or time span, sectoral analysis, or focus on specific issues. Lack of comprehensive cross-sectoral nationwide research regarding the perceptions of the main actors of Ukraine's higher education system (teachers and students) on outcomes of this abrupt transition, inspired the current research. In this regard, we saw the objective of the study in exploring the experience of mass distance learning application in Ukraine's higher education system due to COVID-19 and identifying considerations for e-learning in the national system of higher education within and beyond the pandemic. The research was carried out using a survey. The order of the researchers' actions was as follows: questionnaire compilation, data collection, data analysis, and knowledge generation. In this study, a closed-format questionnaire containing questions with pre-offered answers (multiple choices) was the main research instrument. The questionnaire was distributed to Ukrainian university teachers and students by snowball sampling. The data analysis phase involved analyzing the quantitative datasets. The interpretation of the analyzed information led to the generation of knowledge. 882 responses from 65 Ukrainian higher education institutions were received. The survey data showed that the mass transition to distance learning was a challenge for the majority of Ukrainian universities: only 45.5% of the respondents reported experiences with distance teaching/learning before the pandemic. On the basis of the obtained data, several groups of problems were identified: problems of a technological nature associated with the improper digital infrastructures of Ukraine's higher education institutions, unequal access of teachers and students to electronic devices and Internet connection; problems of a methodological nature associated with a lack of methodological support and special training programs for teachers to carry out distance instruction; problems of a psychological nature associated with the development of motivation, teachers' commitment, and establishing new communication patterns. The research supports the e-learning practice of providing data regarding the experiences of Ukraine's national higher education system on mass and the abrupt transition to distance learning and advances in e-learning knowledge area by envisaging potential for this mode of instruction beyond the pandemic and specifying directions for further research (development of the methodological, technological and informational support model for teachers; studies of the impact of digital learning tools on the mental health of university students; comparative analysis and adoption of the results of international studies into the practice of national education systems; creation of high-quality platforms with an accessible interface and algorithm of use).

Keywords: Ukraine's higher education system, survey, transition, experience, distance learning, the COVID-19 pandemic

1. Introduction

The COVID-19 pandemic as a major factor in the economic, social and mental transformation of the society has become a hot topic of discussion in the world. Social and physical distancing, restrictions on mobility, emergence of alternative forms of work and learning have had short and long term consequences in the global and national dimensions. The pandemic caused the largest malfunction of education systems throughout history, affecting nearly 1.6 billion students in more than 190 countries on all continents (United Nations, 2020). Following the

endorsement of national social distancing directives, education institutions had no option but to resort to distance learning environments and other e-learning resources (Gewin, 2020).

Although education systems were forced to undergo this radical and abrupt shift in teaching and learning and experienced disruptions and challenges, they quickly managed to respond to the force majeure situation, showing innovative approaches in support of education and training continuity. Moreover, the sector of higher education turned out to be among the most prepared to shift the majority of its processes to distance mode. The International Association of Universities (IAU) claimed that disruption caused by COVID-19 also gave an opportunity for higher education to reflect, change and innovate in order to adapt to meet arising societal needs (IAU, 2020).

Since the COVID-19 outbreak, many global and national educational and non-educational organizations have carried out research to analyze impacts, challenges and innovations caused by the pandemic on worldwide higher education (Education International, 2020; Marinoni, Land and Jensen, 2020; Pearson, 2020). Ukraine's higher education system being inextricably integrated into the global one has experienced similar difficulties and challenges. Many Ukrainian teachers had no experience of distance teaching before the pandemic. Therefore, they had to acquire an extensive set of skills over a short period, adapt content and structure of their offerings to new modes of instruction, and select the most efficient methods and techniques of instruction to encourage active distance learning. Several attempts have been made by Ukrainian researchers to analyze difficulties and achievements of the national higher education systems' transition to mass distance learning by which we understand "a method of study where teachers and students do not meet in a classroom but use the Internet, e-mail, mail, etc., to have classes." (Merriam Webster, 2021). However, this research has been limited either by a span of observation (one-time snapshots) (Nenko, Kybalna and Snisarenko, 2020), sectoral analysis (Skrypnyk, et al., 2020), or prevailing attention on a particular set of challenges (e.g., communication, psychological, etc.) (Kovtun, et al., 2021). The lack of comprehensive cross-sectoral nationwide research on manifold difficulties and challenges experienced by Ukrainian teachers and students as the main actors of emergency distant virtual educational environments motivated us to carry out this research. This study aims to explore technological, methodological and psychological difficulties and challenges experienced by Ukraine's higher education system and its actors (teachers and students) in the process of mass and abrupt transition to distance learning due to the COVID-19 pandemic outbreak. The data collected via Ukraine's nationwide survey, properly analyzed and interpreted aims to contribute to advancing the e-learning knowledge area in the global dimension.

2. Literature Review

Analysis of the research on the implementation of distance learning in the COVID-19 pandemic in the system of Ukrainian higher education showed that mass transition to distance education that involves the use of e-learning tools in the online environment was realized in extreme conditions to ensure continuity of the educational process. Most higher education institutions in Ukraine were not fully ready to implement mass distance learning, although regulations on distance learning in Ukraine were approved by the Ministry of Education and Science of Ukraine (MESU) in 2013 (MESU, 2013).

Sultanova and Zheludenko (2020) analyzed the potential of higher education in a crisis situation, explored drawbacks and prospects of digital education as a tool for sustainable development of society and social security of society. Nenko, Kybalna and Snisarenko (2020) identified the inconsistency of distance learning in Ukraine with the requirements of the society to modern information technologies due to "low funding of distant learning technology developments, necessity to upgrade computer equipment and facilities, limited access to the Internet for teachers, lack of adequate technical equipment and access to the Internet for students living in rural areas" (Nenko, Kybalna and Snisarenko, 2020, p.16). This is contrary to the view held by Skrypnyk, et al. (2020). The researchers concluded that with modern information opportunities it was possible to integrate distance learning into education. This could expand the creative possibilities of the educational process, ensure access to education without affecting its quality, increase the availability of knowledge, and the quality of fast-updating content, flexibility, mobility and modularity, which meets the requirements of modern higher education.

Prokopenko and Berezhna (2020) identified the difficulties and advantages of distance learning according to the results of an online survey of Ukrainian students and teachers of higher education institutions on socio-economic issues during the coronavirus. The researchers identified technical issues and psychological problems.

In order to find out problems, difficulties and advantages of the abrupt transition to distance learning in Ukrainian universities Nenka, Kybalna and Snisarenko (2020) conducted an online survey from 01 to 10 April 2020, with the participation of 540 respondents from three major higher educational institutions located in one of the Ukrainian towns (Cherkasy Institute of Fire Safety, Cherkasy Medical Academy and Bohdan Khmelnytsky National Pedagogical University). The authors outlined the current problems that had to be solved to ensure effective distance learning in Ukraine.

Another group of Ukrainian researchers (Grynyuk, et al., 2020, p.2920) held the survey among the university students learning English in four Ukrainian universities: Borys Grinchenko Kyiv University, Kyiv National Aviation University, Kyiv National Linguistic University and Kyiv National University of Trade and Economics. The total number of the respondents was 488. The survey diagnosed the level of psychological readiness of university students to study in conditions of mass and abrupt transition to distance learning and the impacts of new conditions of education on the performance of students. Among the problems that affect psychological readiness of students to study in the altered mode of instruction are the following: low level of motivation, the effect of technology overload, lack of self-discipline and social interaction, time planning, anxiety, perception of information and organizing the place to study.

Khomenko-Semenova, Alpatova and Prokhorenko (2020) studied the problems of the adaptation of humanities students to the conditions of distance learning. 182 respondents of the National Aviation University participated in the survey. The identified problems included the lack of live communication with teachers and group mates, and the absence of social activities at the university campus.

Ukrainian researchers, after examining the rapid transition to distance learning in the higher education institutions of Ukraine, have compiled recommendations. Nenka, Kybalna and Snisarenko (2020) thought that some measures should be taken. These measures include: development of the concept of distance education and the corporate network of universities; implementation of network tools (creation of electronic textbooks and teaching materials); training and retraining of teachers and staff in the methodology and information technologies of distance education; creating an electronic library and its integration into the corporate network of libraries in the region; membership into the International Association of Open Electronic Libraries and other relevant organizations; establishment of distance education centers in universities and unified inter-university system, aimed at "the development of uniform norms, standards, provide methodological support" to improve "the educational process, as well as conduct selective control of educational institutions" (Nenka, Kybalna and Snisarenko, 2020, p.17).

Grynyuk, et al. (2020, p. 2920) proposed to create "the most favorable conditions for students and teachers during the learning process and their full adaptation to training conditions"; provide "individually-differentiated approach to teaching"; create "a well-thought-out system of professional development and retrain teachers" (with organizational and methodological assistance; distant and networked forms of organization; mentoring, exchange of good practices and experience).

Analysis of the literature shows a wide coverage of the concept of "distance learning". At the same time, a gap in the psychological readiness of teachers and students for distance learning was revealed.

The research process aimed at identifying and eliminating the shortcomings of distance learning, the use of its typical tools determined the direction of the present study. The purpose of this study is to study the technical and methodological aspects of distance learning enforcement in the system of higher education in Ukraine. Technical aspects include the availability of software and sufficient equipment to organize the workplace of teachers and students. Methodological aspects are the availability of digital educational resources, methodological support for teachers in distance learning, teachers' experience in organizing distance learning (lectures and practical classes), teachers' competence in assessing the progress of students in the modified mode of learning. We consider these criteria as the key ones for distance learning.

The survey questions for the given study were developed by the team of scholars working over the problem. All in all, there were 4 sections and 30 questions. The current study represents only 4 questions out of 30.

3. Methodology

The study was carried out by a survey organizer - National Aviation University - within the framework of the research project "Potential of higher education in conditions of the pandemic: global, European, national dimensions" of the National Research Fund of Ukraine.

3.1 Research context

After the novel COVID-19 began its global assaults, Ukrainian Government introduced on March 12, 2020 a full lockdown in the educational sphere. Ukrainian education institutions of all levels (universities, colleges, schools) suspended their offline (face-to-face) instruction and abruptly shifted to distance teaching/learning, experiencing difficulties of the forced transitional period. What at first was viewed as a temporary, emergency precaution quickly gave way to a new normal, because the majority of higher education institutions in Ukraine did not manage to return to offline instruction when the 2020-2021 academic year started. As the pace of vaccination against COVID-19 in Ukraine is very low (according to official governmental data "About vaccination against COVID-19 in Ukraine" (Vaccination against COVID-19, 2021), on April 23, 2021, only 508 044 people had received their first dose, that represents only 1.25% of the 40 million Ukrainian population), it is very likely that the Ukrainian higher education system will keep distance instruction as the main mode of instruction in the following 2021-2022 academic year. In this regard, it is important to research impacts and challenges imposed by the COVID-19 pandemic on Ukraine's system of higher education after its forced and abrupt transition to distance teaching/learning in order to accumulate positive experiences and envisage ways for overcoming constraints and advancing e-learning.

3.2 Research design

The analysis of quantitative data begins with description. Appropriate methods are very simple, but at the same time extremely informative. Methods of descriptive statistics were used while conducting the research and solving the tasks. The method of statistical experiment allowed us to analyze the problem under study and process the empirical data with the necessary systematization. The sample – a part of the general population of elements covered by the experiment (observation and survey) – is representative. Thus, the article presents a concise and concentrated characteristic of the phenomenon under study, presented in the form of pie charts, a table and numerical expressions.

More precisely, to achieve the objectives of the research we chose a mixed multi-phased research design implying the use of quantitative and qualitative research methods. A quantitative method was used to process respondents' answers to the questionnaire. In a qualitative method, semi-structured interviews were carried out to gain insights on particular issues in focus group discussions. The study was characterized by four sequential phases: questionnaire compilation, data collection, data analysis, and knowledge generation.

3.3 Participants

The study participants comprised both representatives of teaching staff and students of higher education institutions of Ukraine. Teachers and students were eligible to participate in the study if they were involved in remote class during spring and autumn 2020. The total number of participants was 882. The study was conducted in compliance with the ethical research standards. Prior to the survey, all the participants were informed about the goals of the research and assured that their answers would remain confidential and would be used for the research purposes only.

3.4 Survey instruments

The questionnaire was chosen as the main tool of the online survey method. Practicability of the online questionnaire method was primarily stipulated by the conditions of the COVID-19 pandemic. Among other advantages of this method is the wide coverage of the audience (in our case, teachers and students of higher education institutions) and minimal time consumption.

The survey was conducted using a convenient tool - Google Forms (Vasanth and Harinarayana, 2016), which provided quick feedback from respondents in the form of answers to questions.

The chosen questionnaire method allowed us to solve the main tasks of the current study of distance learning in the higher education institutions of Ukraine during the pandemic and the impacts of the new educational environment on student learning outcomes, namely: identify the benefits of distance learning for teachers and

students; determine the level of the target audience loyalty to distance learning; identify the level of awareness of respondents about possible solutions to problems related to distance learning in the context of the COVID-19 pandemic.

For the purpose of the results credibility, the main limitation of this method was taken into account, which was seen as the lack of control over the high level of representativeness of the sample, as well as the inability to explain questions to the respondent, respectively - low reliability of the data collected. Since the study did not involve high-risk tasks, these limitations were considered not to significantly affect the outcome.

In this study, a closed-format questionnaire containing questions with pre-offered answers (multiple choices) was the main research instrument. Prior to compiling the questionnaire, we reviewed relevant literature on e-learning, studied practices of universities worldwide on evaluating their distance learning performance since the onset of COVID-19, searched official websites of Ukrainian higher education institutions for announcements on changes implemented due to the COVID-19 outbreak, and conducted a focus group discussion with students and teachers. Using this background data, we developed a questionnaire that was composed of three segments. The first segment collected demographics of the participants (belonging to a particular higher education institution, status (teacher/student), age, and gender). The second segment of the questionnaire was aimed at assessing the perception of survey respondents regarding the social and psychological readiness of different actors (authorities, teaching staff, and student population) of the Ukrainian higher education system to the abrupt transition to distance instruction. The third segment (that was viewed by the researchers as the core one) was aimed at assessing the perception of survey respondents regarding the quality of virtual educational environments, educational platforms, teaching tools, techniques and technologies implemented during the abrupt transition to distance instruction in Ukraine's higher education.

3.5 Procedures

The order of the researchers' actions was as follows: questionnaire compilation, data collection, data analysis, and knowledge generation. The compiled questionnaire was aimed at assessing the perception of teachers and students regarding the abrupt transition to distance learning due to the pandemic COVID-19, and its effect on the teaching/learning process in the system of Ukrainian higher education. At the data collection phase, the questionnaire was distributed to participants by employing a snowball sampling method (the researchers asked the initial participants to pass on the link to the questionnaire to their peers who fit the description of potential participants). Participation in this data collection initiative was voluntary, anonymity was guaranteed. The data analysis phase of this study involved the analysis of quantitative datasets. The interpretation of the analyzed information led to the generation of knowledge, which constituted the last phase of the research design. The field stage embraced November 20 - December 15, 2020.

4. The study results

4.1 Survey respondents

We received a total of 882 responses from 65 Ukrainian higher education institutions. 78.5% of the respondents were students and 21.5% of the respondents were teachers. 86.8% of them were female and 13.2% were male. 59% of the respondents were aged 20 and under, 21 to 30 were 19% of the respondents, 31 to 40 - 7.6% of the respondents, 41 to 50 were 7.6% of the respondents, 51 to 60 were 5.3% of the respondents, those over 60 represented 1.5% of the respondents.

The most active in the survey were teachers and students of the National Aviation University, Kyiv National University of Trade and Economics, Flight Academy of the National Aviation University, Lesya Ukrainka Volyn National University, National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Odesa State Agrarian University, Borys Grinchenko Kyiv University, Rivne State University of the Humanities, Ivan Ziaziun Institute of Pedagogical Education and Adult Education of the National Academy of Pedagogical Sciences of Ukraine, National University "Odesa Law Academy", Taras Shevchenko National University of Kyiv, which amounted to 39.1% of all respondents. Since it was impossible to draw conclusions for each region within the framework of this study, the analysis was carried out according to the average indicators of the whole sample (Table 1).

Table 1: The characteristics of the survey respondents

<i>Characteristics</i> <i>Percentage</i>	Actors of the educational process		Sex		Age					
	Students	Teachers	Female	Male	≤20	21-30	31-40	41-50	51-60	60>
%	78.5	21.5	86.8	13.2	59	19	7.6	7.6	5.3	1.5
Totally:	100%		100%		100%					

4.2 Readiness of a higher education institution to implement mass distance learning

This study examined the readiness of the university to implement mass distance learning according to various criteria. The following criteria were taken as such:

- The experience of the actors of the educational process of distance learning before the introduction of quarantine measures in connection with the pandemic COVID-19.
- The availability of software and sufficient equipment to organize a teacher's workplace in education institutions.
- The availability of digital educational resources in education institutions.
- The availability of a system of methodological support for teachers in distance learning.

The tasks of collecting and analyzing the information on the implementation of the requirements and recommendations of distance learning by the educational organizations, the difficulties encountered and the results, are solved through various sociological studies and monitoring conducted by various governmental, public structures, educational and scientific organizations.

In a fairly short time before and after the announcement of the pandemic, the introduction of quarantine and transition to distance instruction in Ukraine, many different studies and surveys of teachers, students and parents have been conducted. A review of such studies gives a general idea about the main problems of the introduction of distance learning, its impact on the educational results of students and the prospects for development.

An analysis of the survey participants' responses has revealed that the mass transition to distance instruction in connection with quarantine measures has become a new reality for most universities. Accordingly, 48.2% of the respondents reported on the partial realization of distance learning, meanwhile the teachers had minimal experience in implementing this format of education. 45.5% of respondents emphasized the full realization of distance learning. 6.3% of respondents have not implemented this format of training (Figure 1).

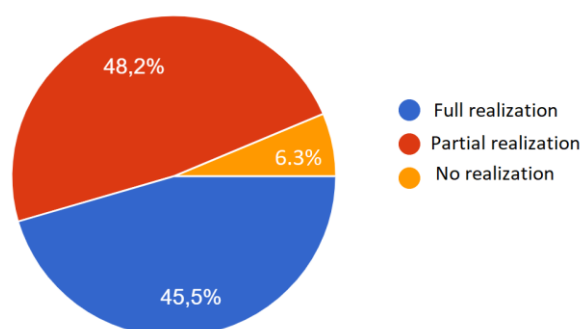


Figure 1: The experience of the actors involved in the educational process of distance learning before the introduction of quarantine measures in the context of the pandemic COVID-19

The analysis of the survey data identified four groups of teachers' problems as the main hardships: video lessons; practice of using online resources; technical problems; organizational problems. It's worth mentioning that even those teachers who did not have a high level of computer literacy before the mass transition to distance instruction quickly oriented themselves and mastered new forms of communication with their students. This conclusion correlates with the conclusion made by UNESCO regarding the progress of distance learning in the context of the pandemic.

Analysis of the opinions of survey participants on the availability of software and sufficient equipment for the organization of the teacher's workplace in universities showed that the awareness of the need and the actual situation in universities on this criterion are different. 59.4% of the respondents who took part in the survey actually indicated the imbalance between the necessary conditions, which, in their opinion, should be created in universities to implement distance education, and the actual state of affairs in universities. 50.1% of the respondents indicated partial realization, 9.3% indicated no realization.

The following were identified as the main obstacles:

- Lack of stable and sustainable connection to the Internet (and the paramount importance of this condition is quite natural);
- Lack of an equipped workplace for the teacher (laptop, computer, tablet, online whiteboard with the possibility of real-time collaboration. It can be assumed that some teachers in the conditions of self-isolation rely on their own home technical resources);
- Insufficient measures of methodological support for teachers in distance learning (Figure 2).

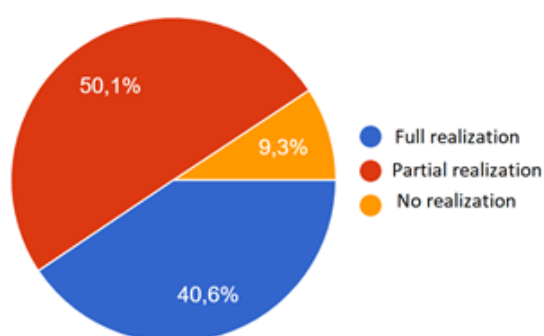


Figure 2: Availability of software and sufficient equipment to organize a teacher's workplace in educational institutions

One of the determining conditions of teachers' readiness is the availability of a system of methodological support. 47.5% of the respondents were aware of this need. Only 45.7% of teachers received such support in the form of master classes, webinars, consultations, etc. (Figure 3). According to the interviewed teachers, today the educational organization does not always have the opportunity to provide full-fledged work and support for the teacher in implementing quality distance learning in the conditions of self-isolation.

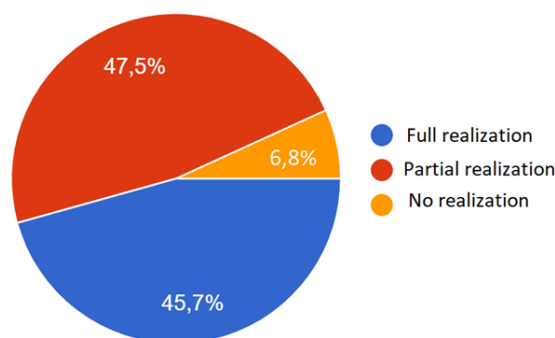


Figure 3: Availability of digital educational resources in education institutions

The effectiveness of distance learning in self-isolation is largely due to the organization of the university administration, psychological readiness and motivation of the teaching staff, students and parents. From the beginning of the pandemic, teachers have been challenged to implement distance learning methods - often without sufficient guidance, training, or resources. In fact, they were largely unprepared to ensure the continuity of instruction and the transition to new teaching methods.

Thus, in response to the difficulties of transition to the new mode of work and study, the support system grew rather quickly. Particular recommendations have been prepared to help administrators and teachers: - general recommendations for the organization of distance learning in the educational organization during restrictive measures in the current epidemiological situation; - methodological recommendations on the organization and conduct of educational work on additional educational programs using e-learning and distance technologies.

These recommendations are elaborated not only on a functional principle, but also take into account the procedural and substantive features of distance learning, and reflect the communicative aspects of the organization of “home” education in an epidemiological situation.

Accordingly, virtually all universities in Ukraine sent faculty members methodological recommendations. The universities created special websites or sections of official websites to inform and help teachers in the current situation. They also launched programs of methodological support for teachers. The most active teachers shared their experience, their knowledge of resources through social networks, and held special webinars.

The diagram in Figure 4 demonstrates that 54% of teachers had a high demand for access to online educational resources with ready-made content for the preparation and delivery of training sessions; 39.9% of the respondents actually had such access. 54% of the teachers believe that the availability of a database in digital format, including multimedia and interactive, test and measurement materials, is a prerequisite for the organization of distance learning classes. However, only 33.9% of the respondents confirmed that such a base is available in the educational organization.

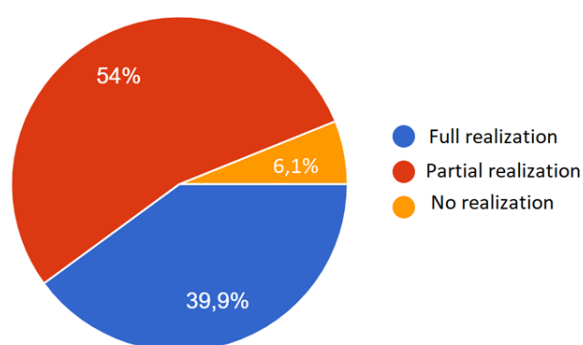


Figure 4: Availability of a methodological support system for teachers in distance learning

4.3 Support for the university administration and teaching staff in the transition of education to a distance learning format during the COVID-19 pandemic

The critical situation required a high degree of mobilization of university management teams to respond quickly to the emerging need, find and implement solutions to non-standard tasks and problems, take the initiative, activate horizontal links of the university community, consolidate forces and resources to restart the entire higher education system online. Thus, the quality of management, both at the level of a particular university and at the level of departments, has become a critical factor in the successful response to the stress test of the pandemic. Most universities formed special management structures in the first days to make operational decisions and implement them. In many cases, however, university senior managers waited for instructions and unambiguous orders from regional authorities. Such caution can be explained by the fear of violating any regulatory restrictions that have been developed in the Ukrainian higher education system.

All in all, the study results (the actual diagram is not given in the text due to the obvious reasons of being limited by the paper size requirements) revealed that 58% of the respondents are satisfied with the support received from the university administration. 18.8% of the respondents are indifferent. 40.6% of the respondents are satisfied with the support of the Department of Planning and Finance, while 35.6% of the respondents are indifferent, 13.2% – unsatisfied, and 5.75% – very satisfied. 47.1% of the respondents are satisfied with the support of the Department of Technical and IT services whilst 29.4% of the respondents are indifferent. The students admitted that they were satisfied with the support of the Department of Student Affairs. 6.4% of the respondents were completely satisfied with the support of the Department of International Cooperation,

whereas 47.7% were absolutely indifferent. 36.4% of the respondents were fully satisfied with the support of the Department of Public Relations. 63.7% were entirely satisfied with the support of the teaching staff.

4.4 The satisfaction level towards various forms of distance lectures due to the cancellation of face-to-face classes

The transition to distance instruction was not a planned but a forced measure, so there was no special training for teachers in this area. Adaptation of teachers and students to the changed conditions of professional activity occurred at different speeds and with different results. Moreover, there is a need to conduct a comprehensive study to understand teachers' and learners' satisfaction towards online learning for effective implementation of the program. The present study aims to assess the satisfaction level of respondents towards use of distance learning and teaching during the COVID-19 pandemic. It is hoped to provide insights on steps necessary for further improvement. Also, this study intends to investigate the benefits of distance learning and teaching for students and teachers which may affect students' productivity levels.

According to the results, the satisfaction level of respondents towards various forms of distance lectures is the following: the majority of the respondents – 66.9% – are satisfied with live distance lectures (videoconferencing) while 18.1% of the respondents are very satisfied and 7.9% – unsatisfied. 45.2% of the respondents are satisfied with video recording (not live), though 31.3% of the respondents think that this form of lecturing cannot be applied. Distance lectures and sending presentations to the students are positively taken by 60.0 % of the respondents, 19.7% of the respondents are very satisfied whilst 9.5 % say that this form cannot be applied. The form of written communication (forums, chats, etc.) is seen positively by 57.5 % of the respondents, 19.4% of the respondents are very satisfied, 9.3% – unsatisfied.

So, we can conclude that among the respondents, the category of students, unlike teachers, was more loyal to the changes in the forms and methods of instruction due to the transition to distance learning. Students had a growing demand for flexible educational trajectories and a variety of learning forms.

4.5 The satisfaction level towards the organization of practical and seminar classes due to the cancellation of face-to-face classes

From the results of the survey it can be observed that the majority of the respondents (66.8%) are satisfied with live distance classes, 15.9 % of the respondents are fully satisfied. It follows that a distance learning environment encourages a positive influence on students' knowledge and the teachers' perception on online education during the COVID-19 pandemic. In addition, there is interaction between participants and real-time feedback.

The graph also shows that half of the respondents are satisfied with distance classes, conducted via pre-recorded video, whilst 30.6% of the students and teachers considered that this mode of distance learning could not be applied (these results can be explained by disadvantages of asynchronous learning: the instructor and the learners are not involved in the learning process at the same time and there is no real-time interaction).

The rate findings of the survey regarding the distance classes, conducted via pre-recorded audio look very similar to the above stated, for instance, half of the respondents are satisfied with distance classes, conducted via pre-recorded audio, some of them are fully satisfied, at the same time about 15% of the respondents are unsatisfied with this type of learning, 34% of the respondents consider distance learning to be insufficient to practice. We can conclude that audio texts are not interactive, so they do not provide the visual elements that many students need. As for teachers, they sometimes encounter obstacles related with the identification of expectations, providing feedback, time management, and technical support while preparing for distance classes, conducted via pre-recorded audio.

The study also reveals the respondents' attitude to presentation-based distance classes. Consequently, the majority of the respondents (78.1%) are satisfied with that mode of distance learning when the instructor sends presentations to the students and they get all the necessary information from presentations. 16.15% of the respondents are fully satisfied. The interpretation of the given data suggests that students have a high level of motivation to attend presentation-based distance classes due to its benefits: visual effects, precise and systemic knowledge structure. About 10% of the respondents are unsatisfied or very unsatisfied with presentation-based online classes. 11.6% of the respondents believe that this mode of distance learning could not be applied.

The survey results clearly demonstrate that the majority of respondents (79.3%) are satisfied with written communication, 16.4% of them are fully satisfied. It should be noted here that written communication allows students to learn at their own pace by giving them full responsibility for learning and the power to attend classes only when it is convenient for them. As for teachers, written communication also has various positive aspects such as: keeping linguistic and factual knowledge, stimulating speaking, listening and reading in a foreign language. Still, about 13% of the respondents are unsatisfied or very unsatisfied with written communication. 7.6% of the students and teachers consider that this mode of distance learning could not be applied.

4.6 Educational technologies of face-to-face instruction which are effective for distance learning in a pandemic environment

As Figure 5 shows, the vast majority of the respondents think that educational technologies such as collaborative learning (56.6%) and individualization of learning (55.9%) are effective. We can assume that the technology of collaborative learning is considered to be productive both by students and teachers due to its benefits. The use of educational technologies, mentioned above, help to develop leadership skills, interaction, self-management, etc. The individualization of learning technology allows students to learn at their own pace. 44.2% of the respondents think that the technologies such as the development of critical thinking, project-based learning (40.1%), experiential learning (30.4%) and problem-based learning (26%) are effective for distance education.

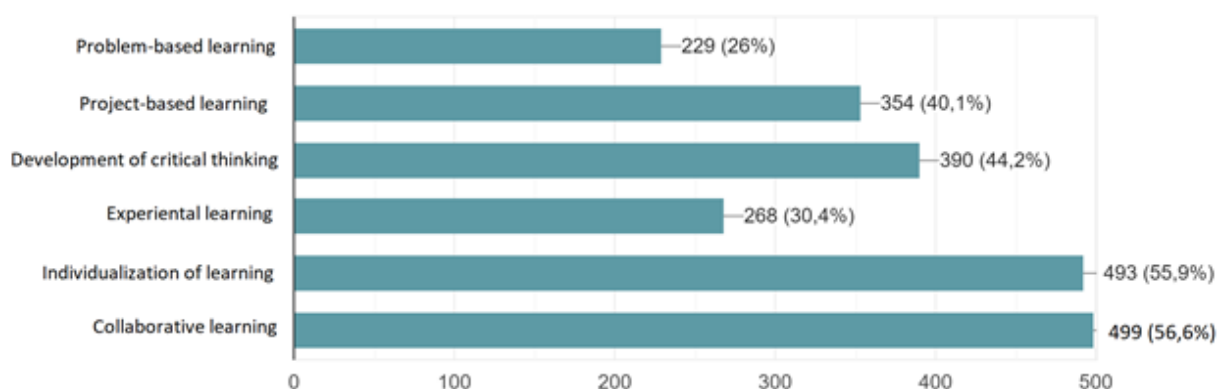


Figure 5: Educational full-time learning technologies that can be implemented for effective distance learning

4.7 The format in which instructional materials are provided

As Figure 6 shows, the majority of the respondents have indicated text (90.2%), E-resources links (69.2%), and video file (64.1%) as the most common formats for instructional materials. Analyzing the students' and teachers' responses, we can suggest that text documents, or files are easy to work with, they can be opened on different platforms being small in terms of memory size. E-resources links could be a rich source of information for those students who use extra learning materials in addition to their regular classroom activities. Video file format makes an educational process more interesting due to its visual effects. The other formats of online resources according to the survey are podcast format, presentations, E-resources and others.

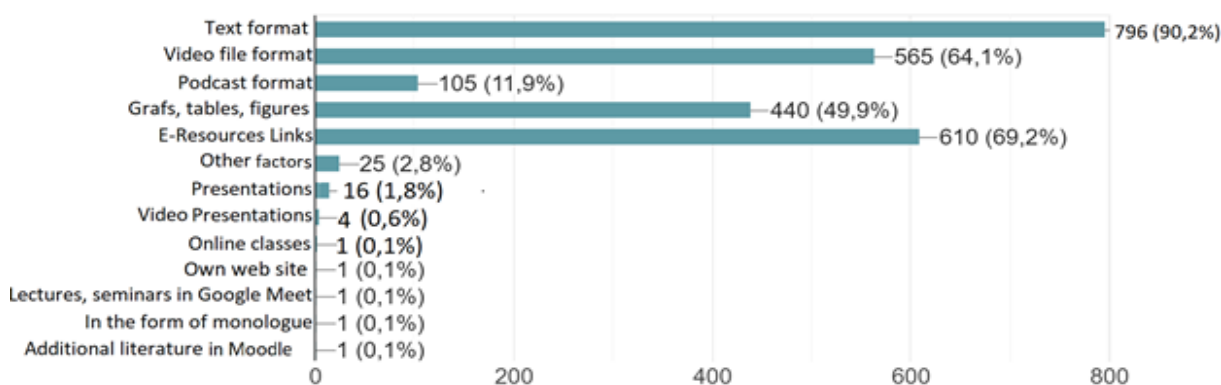


Figure 6: The format online resources are provided

4.8 Factors that hinder full-fledged distance learning

Figure 7 indicates that the majority of the respondents consider students' assessment, and a lack of online resources to be the factors that prevent them from effective distance learning. We can assume that all the factors that hinder fully fledged distance learning, can cause the following situation: students attribute a low value to learning and they do not believe that their effort can improve their performance. Teachers do not believe that their effort can improve the students' performance and increase their motivation.

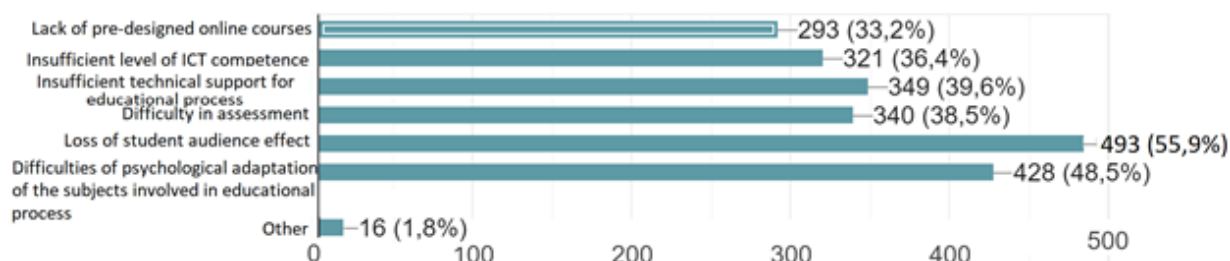


Figure 7: Factors that prevent distance learning

4.9 Distance resources used in the organization of distance learning, preparation for distance classes, formation and performance of homework, control and assessment materials

Figure 8 reveals that the majority of the students and teachers use the resources from such online educational platforms as Zoom (88.3%) and Classroom (85.3%). This fact proves that the innovative approach of Zoom and Classroom technology enhances positive learning outcomes for students. Other respondents use resources from such distance educational platforms and tools as: YouTube (49.5%), Moodle (47.3%), Teams (35.7%), Skype (32.9%), Microsoft (12%), Coursera (7.7%), Kahoot (7.6%), Education (7%), etc.

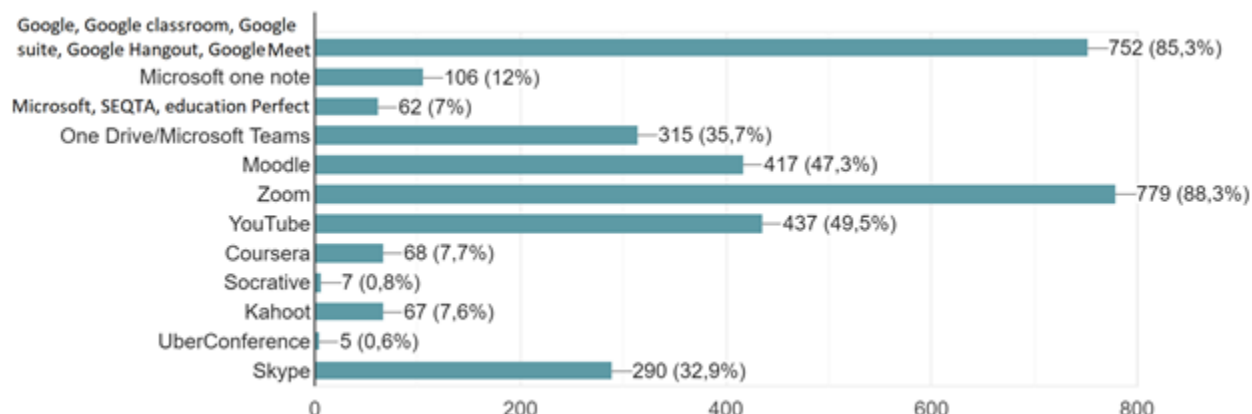


Figure 8: Distance resources, used by the students in the process of preparing for distance classes, tests, doing home assignment

5. Discussion

Survey data showed that:

Ukrainian institutions of higher education were only partially ready for the introduction of distance education. In particular, only half of the respondents managed to shift to distance learning mode during the first weeks of the quarantine period caused by the COVID-19 pandemic. The reasons vary. Firstly, insufficient technical support, lack or improper computer equipment, software problems, limited Internet access (e.g., in rural areas) make distance learning impossible or inefficient; additionally, the lack or insufficient level of methodological competence of teachers to carry out distance instruction, as the latter requires special knowledge and skills. Moreover, teaching methods that are the most appropriate for offline education are not suitable for the distance mode of instruction. It is important for a teacher to know how to encourage students and keep them interested in the online classes.

In order to eliminate the above-mentioned problems and establish effective distance learning, it is necessary:

- at the state level: to increase funding and promote the digitalization of education assuming that modern education is based on the capabilities of the Internet and digital resources. The use of new digital technologies in the distance mode of instruction has already led to a greater flexibility and creativity of both teachers and students. Distance education provides a unique opportunity to ensure continuity of the educational process regardless of destabilizing factors;
- at the scientific level: to substantiate and suggest an educational model for widespread implementation that allows a quick transition from a traditional (face-to-face) education to a distance one and vice versa; to study successful international experience of tackling the problem in order to adapt some elements into the system of higher education of Ukraine;
- at the university level: to focus efforts on teachers' training to carry out distance learning, and to develop new platforms for distance learning.

The survey showed that teachers need support from the university administration, the Department of Technical and IT services. The introduction of short-term forms of advanced teacher training will solve this problem. Teachers need to be told about the advantages of different forms and methods of distance instruction, about the peculiarities of distance education (technical, visual, psychological, methodical, etc.). An important issue is the adaptation of syllabi and curricula, control activities and assessment tools to distance education peculiarities.

Special attention should be paid to international cooperation as an important component of the European integration of Ukraine's education system. The border closure led to a sharp decline in academic mobility and the financing of the international projects. The cancellation of overseas travels and the postponement of scientific conferences were the most common consequences of the COVID-19 pandemic. At the same time, the forced transition to distance instruction opened up new, more flexible educational prospects (blended or hybrid learning, combination of synchronous and asynchronous e-learning). COVID-19 increased virtual mobility and/or collaborative online learning as an alternative to physical mobility of teachers and students.

In general, the survey results showed that the effectiveness of distance learning depends on the joint efforts of university administration, teaching staff and all, without exception, university departments.

As for the respondents' satisfaction with various forms of online lectures due to the cancellation of face-to-face classes, it should be noted that students turned to be more loyal to the changes in the modes and methods of instruction caused by the transition to distance learning. Most students were fully satisfied with this way of learning and the suggested forms and methods of e-learning. The same can be said about the organization of practical and seminar classes.

We assume that students' satisfaction with online lectures and seminars is connected with their understanding of e-learning tools and their ability to manage the gadgets necessary for distance learning. Students also appreciate the possibility to improve self-management skills, time-management, task formulation, etc. However, according to the survey results, a certain percentage of respondents indicated dissatisfaction with the organization of online classes. We believe that the following objective factors serve as justification: an increase in the number of tasks and a short time span for completing them, poor task assessment, lack of skills to work with online resources, same-type tasks, etc. In this regard, we can conclude that students showed their readiness to continue studies in distance mode beyond the pandemic. However, there is a need to reconsider the online mode both for students and teachers. In particular, we consider it effective to reduce the duration of online classes, to use special forms and methods of instruction, and improve the system of students' assessment in distance learning mode.

The survey results showed that some educational technologies of conventional education are effective for distance learning in the pandemic. Among them are: the technology of collaborative learning, the individualization of learning, and the development of critical thinking. Other technologies (project-based learning, experiential learning, and problem-based learning) were recognized by the students as less effective. This result confirms the idea that distance education requires special methodological elaborations on learning technologies.

The issue of using modern learning technologies was relevant in Ukrainian education before the COVID-19 pandemic. In particular, according to the government's "Medium-Term Action Plan until 2020" (Government

portal, 2017) and other documents, the Ukrainian society needs highly competent, mobile, responsible specialists endowed with a culture of professional communication and willingness to generate their own scientific innovations that will contribute to economic and social development. Today, in the conditions of distance learning, effective technologies enable not only the acquiring of new knowledge and skills, but they also ensure the development of soft skills, which are an integral constituent of a competitive specialist in the labour market. This is evidenced by numerous studies showing that high unemployment rate among university graduates occurs because teachers ignore soft skills, especially the so-called 4C (creativity, critical thinking, communication and cooperation).

According to the survey, text is the main format in which learning materials are provided. We agree with the researchers that the development of effective online programs that can fully replace offline learning, making it interactive, rather than simply transferring information into a digital format, needs special knowledge and skills, programming skills, in particular. In our opinion, the development of such programs requires the collaborative efforts of IT-specialists and the specialists in the field of higher education (specialists in various disciplines). Accordingly, it requires additional funding. In addition to the development of programs, methodological teacher training for online instruction and practical teacher training in mastering modern Internet technologies are also needed.

The survey revealed that the main factor preventing fully fledged distance learning, according to students, is the objectivity of results assessment in the distance learning mode. It is obvious that for greater objectivity it is necessary to change the forms of control. Accordingly, special attention should be paid to the objectivity of control measures (exams, tests, thesis defenses, etc.). Therefore, the successful experience of higher education institutions in European countries should be used by the national education system of Ukraine.

The importance of using the Internet resources in higher education lies in the following. Information technology is not only a tool for solving specific pedagogical tasks, but it also brings variety into the organization of the educational process, develops the skills of independent learning, and stimulates the designing of educational processes.

The survey revealed that the majority of teachers used only two online educational platforms for the distance learning process: Zoom and Google Classroom. Undoubtedly, the free web service for distance learning Google Classroom combines services Google Drive, Google Docs, Gmail, Calendar, etc. and is one of the most effective means of solving educational tasks. Sultanova and Zheludenko (2021) conducted the research. The study results correlate with the findings of the current research and confirm the effectiveness of using the cloud technology in distance learning. However, other platforms and resources are not used at full strength, despite their extensive opportunities. In the transition of education to distance learning, digital and information support is of paramount importance, because the success in society is associated with the Internet in the broadest sense and with gadgets in the narrow sense as working tools, sources of information and means of self-realization.

6. Conclusions

On the basis of the obtained data, several problem groups can be identified:

- problems of a technical nature: technical maintenance (the Internet quality, the availability of modern technical digital learning tools) and technical support. According to the research made by the Ministry of Digital Transformation of Ukraine, 65% of villages do not have broadband Internet access (Epravda, 2020);
- problems of a methodological nature: lack of methodological support and special training for teachers to carry out distance instruction. Teaching methods that are sufficient for offline education are not suitable for distance learning. Only 45.7% of teachers had the opportunity for methodological support in the form of workshops, webinars, consultations, etc.;
- problems of a psychological nature: the development of motivation, the teachers' commitment, the establishing of a new communication pattern, and maintaining the value of education as one of the priorities in the system of universal values. What is more, a digital society is creating emotional and psychological problems for students who have limited access to the Internet and they automatically find themselves in social isolation, thus, developing the basis for social inequality;
- problems of a content nature: task overload, the content of online platforms, the quality of learning materials, the correlation of the informative nature of the materials and their quantity;

- lack of digital infrastructure which provides access to the Internet and a mechanism for filling in the platforms, optimal tools for work with platforms, development of methods for determining performance criteria, etc.

The analysis of the survey results allows us to formulate the positive characteristics of distance learning in the pandemic:

- high demand for access to online educational resources, satisfaction with online classes in real time, self-paced learning, the development of critical thinking (this result indicates the great potential of the distance learning method, but at the same time points to the need for self-organization, which in the context of distance education has acquired the important status of a basic component of learning);
- the level of respondents' awareness of e-learning tools and the opportunities to use them. Popular digital tools (Zoom, YouTube, Google Classroom, Moodle) are the basis of education. The overall statistics on the number of users of the most popular digital tools is quite compelling: the number of Zoom users in March 2020 was over 200 million users per day, and the number of Google Classroom downloads as of March 30, 2020 was over 50 million.

7. Research prospects

- The transition to distance learning should be considered comprehensively, as a phenomenon of an information-technical, psychosocial nature, given the rate of updating and the volume of information content on the Internet. In practice, this can be achieved by creating a single digital market for services and knowledge, which will help to adapt to the changes associated with digital transformation.
- The development of a methodological, technical and informational support model for teachers; the study of the impact of digital learning tools on the mental health of university students; the comparative analysis and the adoption of the results of international studies into the practice of the national education system.
- The development and the integration of a new model of education, providing a combination of traditional and distance learning; the criteria development for successful distance learning implementation and the optimal time management model (online learning in real time and time to process and prepare the material); the creation of high-quality platforms with an accessible interface and algorithm of use.

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