Teachers’ Readiness for Distance Education: From Theory to Practice

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Abstract
The paper has a two-fold purpose. The first purpose of the research is to clarify the concept of “readiness of teachers of higher education institutions to use distance learning technologies”, to determine the components and indicators of teachers’ readiness to use distance learning technologies. The other purpose is to announce the results of the conducted online survey on teachers’ readiness for distance learning; understand how distance learning methods are being implemented, which need to be modified or improved, establish the depth of complications associated with transitioning to online teaching due to the introduction of COVID-19 quarantine and provide the information to stakeholders to further improve the process of distance learning. The article is based on the survey of scientific literature on teachers’ readiness/preparedness to distance education and results of the authors’ COVID-19 Teachers’ Questionnaire with 485 faculty members of major higher education institutions of Cherkasy region (Ukraine). The author proves that the effectiveness of distance learning depends on subjective (teachers’ and students’ preparedness for distance education) and objective factors (material and technical base of higher education institutions). Components of teacher’s readiness for distance learning and their indicators are summarized: motivational, cognitive, operational, technological, creative, personal. The outcomes of the questionnaire have identified that most respondents lack theoretical knowledge and practical skills necessary for the implementation of distance learning and encounter difficulties in teaching during quarantine.

Keywords: higher education, teacher’ readiness, distance education.
1. Introduction
Current trends in the education of young people in the mode of remote access to educational resources intensify the emergence of changes in the system of professional training in higher education institutions. The latter should provide all conditions for the effective implementation of distance learning, adapt the existing types of education and by means of new information technologies intensify the independent work of students, individualize and differentiate their education, increase the amount of available educational resources, provide the possibility of communication regardless of teachers’ and students’ geographical location. However, according to the analysis of the experience of pedagogical work, there are obstacles that prevent the effective implementation of distance learning: lack of appropriate regulatory framework, unpreparedness of teachers and students for educational innovations, weak technical base of higher education institution, underestimation of the complexity of creating distance learning courses and e-teaching materials by the management of institutions, high cost of training, etc.

The teacher’s personality deserves special attention, since his/her readiness for distance education, on the one hand, is in demand, and on the other – uninitiated and passive. Teachers are not sufficiently prepared to use information and communication technologies in the educational space and, unfortunately, sometimes students’ computer literacy is higher than teachers’.

2. Theoretical Foundations
The sociological study conducted by experts of the UNESCO Institute of Information Technology in Education revealed requirements for contemporary learning conditions (distance, openness, flexibility, individualization) that can be met only by using models, forms, methods and learning technologies based on the comprehensive application of information and communication technologies (p. 53, The state of educational needs of adult population of the largest countries of the Commonwealth of Independent States and the possibilities of their implementation through distance education technologies, 2003).

Distance learning is considered to be one of the fastest growing trends in educational uses of technology (p.11, U.S. Department of Education, Office of Planning, Evaluation, and Policy Development, 2010) and one of the most contemporary forms of education based on the global computer communications (such as Internet) and presupposes individual work of students with well-chosen learning material, as well as active communication with teachers and other students (Shostak, 2010).

The most relevant for our study is the definition of distance education by D. Keegan, who interprets it as one that frees a student from the need to travel to a “permanent place at a certain time to meet a fixed person to study as a result of technological division into a teacher and a student” (Keegan, 1995). A teacher and a student can be separated by space and not necessarily tied to a particular time, which is especially important in the quarantine time, introduced throughout Ukraine by the Resolution of the Cabinet of Ministers of Ukraine №211 (March 11, 2020) and the Resolution of the Ministry of Education and Science of Ukraine № 406 (March 16, 2020).

The comprehensive use of distance learning by means of contemporary electronic devices and the Internet is an international trend in the global higher education system. Concordantly, modern world trends actualize the widespread introduction and development of distance education in Ukraine.

The expansion of distance education in Ukraine began much later than in Western Europe and was carried out under conditions of low level of informatization of Ukrainian society, a small amount of computer equipment in Ukrainian educational institutions and the lack of specialized methods of distance learning (Ohiyenko, 2012). At present, theoretical, practical and social aspects of distance education have been widely well-considered, but the distance learning system has not been sufficiently implemented in higher education institutions and is
currently only in its infancy. The number of scientific organizations and higher education institutions in Ukraine that actively promote or use appropriate distance learning courses is quite small. Scientists have outlined a range of technical, psychological, legal, methodological factors that slow down the introduction of distance learning in Ukrainian higher education institutions, in particular:

- insufficient development of the theory and practice of informatization of education in Ukraine (Opanasyuk, 2016);
- contradictions between the social requirements to the high qualification of specialists and the slow reform of higher education (Holovenkin, 2019);
- modern requirements for digital competence of graduates of higher education institutions and insufficient use of pedagogical opportunities for distance learning;
- the needs of modern youth in interactive communication and distance learning and insufficient readiness of teachers to implement distance learning.

Analysis of pedagogical experience revealed some other obstacles to the effective implementation of distance learning: lack of appropriate regulations, unpreparedness of teachers and students for educational innovations, weak material and technical base of higher education institutions, underestimation by management of the complexity of distance learning, lack of educational and methodological materials, high cost of training, etc. (Trotsko et al., 2019).

Much of attention in the distance education literature is centered around the learner and learning, practically to the exclusion of the teacher and teaching. Consequently, faculty members have been left suspended in virtual space (De Simone, 2006). Nonetheless, an important element of distance education is a peculiar teaching staff, which is characterized by qualitatively new features starting from a fundamentally new level of professional and computer knowledge and skills to knowledge of the conceptual issues and didactic of distance education (Korovaychenko, 2001). According to Korotkova and Trotsko (2018), teachers of Ukrainian higher education institutions are not prepared for distance education and, unfortunately, often students have better computer skills than teachers.

Foreign and domestic intellectuals are unanimous in the opinion that the effectiveness of distance education depends largely on the teachers’ preparedness for this process (Karelina, 2004; Kirilenko, 2006). The matter is aggravated by the fact that teachers’ readiness for distance education remains low, and the high quality of education is desirable and only declared in official orders and reports (Trotsko et al., 2019).

Apparently, there is an obvious need for purposeful preparation of the faculty staff for distance education. According to T. Gromova (2008), the teacher’s preparation for activities in the distance learning system is understood as formation and enrichment of his/her knowledge, skills, and attitudes necessary for the successful implementation of this activity. Readiness is the result of such preparation.

The notion of faculty/teacher’s readiness for distance education is not new in Ukrainian literature, however, there is still no holistic view of the concept of teacher’s readiness for distance education. N. Ruchynska (2013) understands a teacher’s readiness to use distance learning technology as a complex dynamic quality of a teacher's personality, which is characterized by a certain level of formation and functioning in the unity of motivational-content, activity-integration, creative components and determines the level of teacher’s readiness to use the technology of distance learning in professional activities.

Readiness of future teachers to use distance learning technologies is understood as the availability of professional competencies in the use of these technologies, as well as beliefs, professional memory, thinking, pedagogical orientation of thought, which ensure the successful performance of professional functions (Vasylyeva, 2017).
By readiness for the implementation of distance learning Dikalova, M. V. (2013) means a stable integral dynamic quality of a personality that determines the content, orientation and nature of its activity in the process of professional self-determination and self-realization.

Within the context of this study, teacher’s readiness to distance education refers to their willingness, their preparation for basic technical and communication skills and training new teaching methodology for e-learning (p.5, Thanh Thi Ngoc Phan & Ly Thi Thao Dang, 2017).

The results of the literature search show that readiness for pedagogical activity in the conditions of distance education is formed in the process of professional and personal development of a specialist and it can be viewed as the process and the result of the formation of personality as a subject of professional activity (Dikalova, 2013).

The problem of measuring teacher’s readiness for the implementation of distance learning is associated with the problem of identifying criteria and the levels of its formation. Analysis of the structure of teacher’s readiness for distance education yielded several components that emerged from the faculty experience of transitioning to online teaching. The extent of teacher’s readiness to distance education as a unity of components can be assessed by the following components: motivational, cognitive, operational, technological, creative, personal. Each criterion is revealed through the relevant indicators, which can be used to judge the level of its formation.

Motivational component (Dikalova, 2013; Zaitseva, 2015; Vasylyeva, 2017) determines the motive, goal, desire of the teacher to apply distance educational technologies in their professional practice. Indicators of the motivational component of the university teacher’s readiness to organize distance learning can be as follows: awareness of social, professional and personal significance of distance learning technologies; desire for self-education, self-improvement to use distance learning technologies in professional activities.

Cognitive component (Dikalova, 2013; Mukoviz, 2015; Zaitseva, 2015) includes knowledge and skills that allow the use of these technologies in professional activities. Indicators of the cognitive component of teacher’s readiness are: knowledge of modern approaches to the application of distance learning technologies; knowledge of software for diagnostics, control and evaluation of students' academic achievements; awareness of the theoretical foundations of distance learning; opportunities of distance learning technologies for communication, interaction and joint activities; rules of electronic correspondence and communication; features of designing distance courses; knowledge of software and hardware of distance learning technologies.

Operational component (also known as activity-integration component (Vasilieva, 2017) reflects the practical readiness of teachers for distance learning and implies a set of skills and abilities related to the use of distance learning technologies in professional activities, in particular: ability to promote the quality of training with the use of distance learning technologies; skills of using universal and special distance learning technologies; ability to develop educational resources, means of assessment of students' academic achievements with the help of distance learning technologies; to organize and moderate electronic communication in individual, pair and group activities by means of distance learning; ability to correlate the pedagogical task with the possibilities of the educational resource of the Internet.

Technological component of the teacher’s readiness for the successful use of distance technologies (Dikalova, 2013; Zaitseva, 2015) is a combination of practical skills necessary for the implementation of the aforementioned form of training in professional activity. The skills included into the technological component are the skills to put into practice distance learning methods. The following skills can be attributed to the indicators of the technological component: ability to build one’s own educational process on the basis of distance learning technology; general skills to combine ready-made electronic products in professional activities: electronic text documents of various formats, electronic text documents with graphic elements, drawings, etc; practical skills and abilities to design, create and combine...
own presentations, video and audio fragments; methodical skills of analysis and support of thematic discussion in a forum and chat. 

*Creative component* (Makahon, 2002; Vasylyeva, 2017) includes teacher’s awareness of creative orientation of this type of educational activity and mobilization of all resources for the development of innovations. Indicators: ability to individualize the educational process in terms of a single educational resource; ability to analyze and adjust the educational process of distance learning technology. 

*Personal component* (Dikalova, 2013; Makahon, 2002) reflects personal qualities that contribute to improving the results of the educational process: psychological readiness for distance education: communicative and organizational skills; high level of professional motivation; tolerance, friendliness, openness, self-perception and perception of others, propensity to risk, creativity, innovation; low level of anxiety; democratic style of interaction; style of behavior in a conflict situation – cooperation. 

The above criteria and indicators of teachers’ readiness for the implementation of distance learning serve as input to estimate the development of this quality. Studying the readiness of teachers for distance learning, we see it as a readiness for more complex professional pedagogical activities.

### 3. Empirical Study

**Time and location.** In the time period from 15 to 30 April 2020, Ukrainian researchers conducted an online survey to investigate readiness of Ukrainian teachers from major higher education institutions of Cherkasy region (central Ukraine) to the distance learning during quarantine caused by the spread of COVID-19 in the world and Ukraine. 

**Means of the survey.** The COVID-19 Teachers’ Questionnaire consisting of twenty questions was the main method of the study. The validity of the Questionnaire was determined by the relevance of the content of questions to the purpose of the study. The proposed questionnaire consisted of 20 questions, the content of 17 of which was directly related to the issue of distance education (three questions were devoted to clarifying general information about the respondent). The Questionnaire was distributed through the following channels: Google Classroom; Google Forms; e-mailing to respondents. The survey was conducted online and was based on the principles of anonymity and confidentiality. In line with aforementioned, it should be noted that respondents were already knowledgeable about digital technology and answered the questionnaire based on their own experience.

**Participants.** Teachers from three leading higher education institutions of Cherkasy region, Ukraine, took part in the survey: Cherkasy Institute of Fire Safety, Bohdan Khmelnitsky National Pedagogical University at Cherkasy, Pavlo Tychyna Uman State Pedagogical University. The total number of respondents - 485 people (306 women; 179 men). The survey was anonymous. No special selection of the teachers for the questionnaire survey has been done. 

The survey involved the next age categories of faculty members: 41-50 years – 42,3% (205 people); 26-40 years – 26,8% (130 people); more than 50 years – 20%; under 25 years – 10,9%. 

The professional experience of teachers ranged from 1 year to 20 or more (1-5 years – 12,2%; 6-10 years – 15,3%; 11-20 years – 15,6%; 21 years and more – 56,9%). 

**Findings.**

**3.1. Computer skills & previous e-learning/teaching experience.**

Conducting distance learning assumes that all participants in the educational process (teachers and students) own a computer, have computer skills and Internet experience, can send, forward and receive e-mails, understand the features of organizing a remote lesson in real time, use active applications (PowerPoint presentations, drawings, videos), organize discussions via chat or audio. That is why, primarily, it was necessary to find out how well teachers use modern gadgets, electronic communications, to understand the level of their
training in the field of information and communication technologies, the use of Internet resources, and the teachers' practical experience of distance learning. 55, 9% of respondents have a personal computer at home, 40% use a computer that is utilized by other family members, 4, 1% brought computer from work for a quarantine time. Almost all respondents (89, 9%) are registered on social networks, exchange files by e-mail, send text messages or make phone calls. 58, 7% of teachers have diverse interactive experience, which primarily involves the use of applications for mobile devices (smartphones, tablets) - Skype, WhatsApp, Viber, Telegram. As a source for searching for specialized information in the field of professional interests, most faculty members use search engines on a computer, YouTube and mobile phones. Respondents have experience in participating in online seminars on professional topics that have been posted on various Internet resources. More than half of the surveyed teachers participated in such seminars (56, 9%).

The next set of questions in this questionnaire allowed to identify that only 7,8% of teachers have previous distance education experience; 18,3% of teachers are partially familiar with the forms of distance learning, but have no experience in their application; 73,9% lack theoretical knowledge, practical skills and abilities necessary for the implementation of distance learning. 83,9% of teachers mentioned that they did not receive special training for distance learning neither in higher education institutions nor during advanced training. Nonetheless, 75,1% of respondents expressed a desire to undergone advanced training to upgrade their skills and learn how to design e-learning courses.

### 3.2. Current e-learning/teaching.

It was important for the study to determine how teachers of higher education institutions organize distance learning, how its benefits are realized, what tools teachers use, how effectively and flexibly; how much time respondents use to prepare for educational activities and how much time – for their own educational activities; how many students participate in events remotely, etc. The survey found that the vast majority of teachers (95,9%) despite the lack of skills and abilities of distance learning still work with students remotely. Regarding the activity of students in distance learning (question: What percentage of students actually participate in your disciplines during quarantine?), We found that 87, 3% of students still continue their studies during quarantine.

As to the number of academic disciplines taught by Ukrainian teachers simultaneously, it was found that most teachers teach 5-8 disciplines for students of different years of study (7-8 disciplines – 26, 8%; 6-5 disciplines – 22, 7%; 10 disciplines – 16, 1%; 1-4 discipline – 12, 7%; more than 10 disciplines – 9, 9%).

At the same time, 30,9% of teachers adhere to the previously approved class schedule; 47,8% of respondents partially adhere to the schedule; 21% of respondents do not follow the schedule at all.

For distance learning tools used in quarantine, teachers were asked to choose one or more answers from a list (Google Class, Moodle, CiscoWebex, Microsoft Office, Zoom, Hangouts, Meet, Skype, Facebook Messenger, Telegram, YouTube, e-mail, personal website, Viber, Tic Tok, Instagram, WhatsApp, FreeConferenceCall, Googledisk, personal blog, mobile phone, website of the institution, etc.). The programs and resources most commonly used by teachers for distance education are shown in Figure 1.
Obviously, e-mail and Viber have become the most common means of distance communication with students: almost 83% of respondents use e-mail and more than 78% of respondents indicated that they use Viber as a tool for distance learning. Similar data were obtained during the survey of 540 Ukrainian students in the time period from 01 to 10 April 2020 (Nenko et al., 2020).

73.6% use GoogleClass, while teachers say that such a tool is not voluntary, as the management of higher education institutions insists on it. Messengers and platforms popular among young people are mostly not used: Instagram - 6%, Tik Tok – 0.3%.

Thus, there is a certain inconsistency between teachers in educational institutions regarding the use of different technologies and forms of education. Teachers use different platforms, technologies, social networks, which has complicated the organization of student learning at home.

In addition, the fact that the majority of respondents chose only one or two options from the list indicates the need to acquaint them with tools that provide different educational needs and perform different tasks.

If we differentiate the tools for lectures, laboratory and practical classes during quarantine, we have the following results:

- 40.7% of respondents spread lecture material by sending lecture notes by e-mail; laboratory classes during quarantine are not conducted or postponed (indicated by 67% of respondents); other classes are conducted mostly by attachment of e-books or other information in the GoogleClass (as noted by 58.9% of teachers). Consultation, verification and review of tasks are carried out by e-mail.

- 40.7% of the surveyed teachers send lecture notes to their students; 22.4% - give on-line lectures; 20.8% - send presentations; 16.1% - send video records.

As for the classes, 41.1% of respondents teach on-line (58.9% send e-books only). During online classes feedback is provided, students answer the teacher’s questions and ask their questions on the topic in chat or via audio communication.

The survey also exposed that teachers in the process of distance learning do not meet their needs for creative self-realization due to such possible reasons as outdated approaches to the provision of educational services, overwork, and lack of motivation for both teachers and students.
3.3. Forms of control of e-learning outcomes.
In the course of the research we were also interested in whether teachers conduct current control of students’ work, forms of current control of students’ knowledge and whether the distribution of scores has changed with the transition to distance learning. The survey showed that most teachers have feedback and communicate with students in different ways. 63.9% of respondents carry out monitoring and evaluation of students; 25.8% of teachers partially evaluate their students; 10.3% do not check and evaluate the work of students during quarantine. We consider this to be a positive trend, since communication with the teacher and assessment motivates young people to learn, especially in quarantine. Forms of knowledge control during e-learning are graphically presented in Figure 2.

Figure 2
Forms of current control

<table>
<thead>
<tr>
<th>Form of control</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-line testing (Google forms, etc.)</td>
<td>17.90%</td>
</tr>
<tr>
<td>Sending written tasks via e-mail</td>
<td>23.70%</td>
</tr>
<tr>
<td>Oral examination (Skype, Zoom, Meet, Hangouts)</td>
<td>39.60%</td>
</tr>
<tr>
<td>Homework or tests (handwritten)</td>
<td>71.90%</td>
</tr>
</tbody>
</table>

Source: author’s calculations based on the conducted survey.

Teachers indicated that during distance learning they take homework or tests mainly in the following format (possible combination of forms):
- handwritten written works (photo or scan) and sent by e-mail or messenger (38.5%);
- works in the format of presentations, abstracts or essays sent by mail or messenger (55.9%);
- on-line questionnaires or forms with tests (31.9%);
- presentation of work during video conferences (11.1%).
61.8% of teachers also indicated that they have somehow changed the distribution of points in assessing students’ knowledge, as the emphasis shifted to independent work of students. Regarding the amount of time that teachers spend preparing for distance education, it was found that the average time for preparation is from 2 to 4 hours for 36.5% and from 4 to 6 hours for 22.5% (Figure 3).

Figure 3
Average time for preparation

<table>
<thead>
<tr>
<th>Time for preparation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 2 hours</td>
<td>7.30%</td>
</tr>
<tr>
<td>2-4 hours</td>
<td>11.90%</td>
</tr>
<tr>
<td>4-6 hours</td>
<td>36.50%</td>
</tr>
<tr>
<td>6-8 hours</td>
<td>22.50%</td>
</tr>
<tr>
<td>More than 8 hours</td>
<td>21.80%</td>
</tr>
</tbody>
</table>

Source: author’s calculations based on the conducted survey.
3.4. Difficulties during e-education.
The majority of respondents (94%) sincerely admitted that they encountered difficulties in teaching using on-line teaching technologies. Such a high percentage is due to the fact that teachers have no previous experience in using online communication tools for consultations and classes and experience in using elements of distance education to control the students’ educational and cognitive activities.

In open answers, teachers shared their views on the obstacles to effective distance learning in quarantine. The scope of problems is wide: insufficient coverage of remote areas by the Internet; poor technical equipment of both teachers and students; insufficient level of technical training of teachers to work with interactive programs; psychological problems of teachers when using voice communication and when working with a video camera; low capacity of the electronic network during educational or examination teleconferences; excessive bureaucracy of distance learning; some students living in rural areas do not have the appropriate technical equipment and access to the Internet, etc.

According to the survey the basic obstacles for effective distance education are as follows:

- lack of computer literacy – 55.9%;
- irregular communication with all students in a class (not all students can get in touch with a teacher) – 54%;
- lack of a single standard for all disciplines – 43.1%;
- lack of technical means for video communication – 33.6%;
- inconvenience of e-learning platforms – 24.1%;
- lack or instability of internet connection – 17.1%;
- lack of necessary equipment at home – 15%;
- Difficulties in gathering all the students in class at one time – 12, 2%, etc.

82.9% of teachers have sufficient Internet connection for distance learning. 6.9% of teachers have poor internet quality; 10.2% of respondents have irregular connection to the Internet. In our opinion, this is due to network congestion as a result of remote work of many people, which reduces the power and speed of the Internet connection.

Regarding teacher evaluation of effectiveness of current distance learning during quarantine, we have the following results: low – 41.9%, average – 36.5%, high – 21.6%. Such indicators can be explained by the fact that now teachers in the conditions of compulsory distance learning during quarantine have to adapt to a new role and learn to simultaneously combine and apply their knowledge and skills in pedagogy and psychology, professional disciplines and information and communication technologies.

4. Conclusions
Considering that the system of distance learning in Ukraine is currently only in its infancy, there is a need to solve a set of management and organization, logistical, financial, staffing problems of distance education. It is affirmed that teaching staff is an important element of distance education. The formation of teachers' readiness for the introduction of distance learning technologies is an urgent problem of modern science. Readiness of a university teacher to use distance learning is a combination of professionally significant knowledge and skills, as well as a focused expression of personality, including internal prerequisites for the teacher's activities using innovative technologies in the educational process. The degree of teacher's readiness for distance learning can be assessed by the following criteria: motivational, cognitive, operational, technological, creative, personal. The indicated readiness is a personal phenomenon, it mediates the relationship between the effectiveness of the teacher and his focus on improving his professional level.

Based on the analysis of the scientific literature on distance learning, own pedagogical experience and the COVID-19 Teachers’ Questionnaire proved the need to solve the problem of professional self-improvement of teachers, which arose due to their unpreparedness for the introduction of distance learning in higher education institutions. The conducted survey
showed the insufficient level of formation of this readiness. 73.9% lack theoretical knowledge and practical skills necessary for the implementation of distance learning. 94% of teachers encountered difficulties in teaching during quarantine.

The review does not cover all aspects of the problem under study. Issues of specialized training of teachers to distance learning, taking into account the specifics of the subject, require further study.

References


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