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Examining the Practices and Challenges of Distance Education of PhD Candidates in the Context of COVID-19

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Abstract: The distance education system is actively developing in the world due to the COVID-19 pandemic. The sharp transition of PhD candidates to distance education caused difficulties in organising the educational process. The aim of this study was to analyse the methods of distance education for postgraduate students in the context of a COVID-19 pandemic. A survey of graduate students was conducted through specially-designed and semi-standardised interviews of focus groups of producers and consumers of educational services. The study showed that the process of adaptation of postgraduate students majoring in Physical Culture and Sports and Biology was much more difficult than in the major Educational, Pedagogical Sciences and Philology. The reasons for the problems of distance education of PhD candidates included the complexity of creating educational and methodological materials for distance learning; lack of a centralised system of certification and accreditation of electronic courses; insufficient motivation of teachers; shortage of teachers who could competently develop distance learning courses in higher education. The study identified opportunities to implement promising areas of online learning in the system of training of academic and teaching staff: retraining of a large proportion of the teaching staff, implementation of a system approach to the development of the online environment of educational institutions, development of skills and abilities to use educational content. Prospects for further research include the study of problems of violation of academic integrity by postgraduate students in the course of distance learning.

Keywords: training of PhD candidates, distance education/learning, COVID-19 pandemic, online learning technologies, health and recreational technologies.

Introduction

The COVID-19 pandemic has significantly changed social reality. Having been faced with quarantine restrictions, educational institutions switched to the introduction of distance education as the main and sometimes the only possible learning environment. Higher education has faced new challenges and obstacles due to the total transition to distance learning. The transition of higher education to the prevailing distance form has led to the transformation of educational practices of teachers and postgraduate students who were forced to work with educational materials online. This has created a challenging situation in higher education systems, especially regarding the training of academic and teaching staff.

Literature Review

In general, the problem of introducing distance technologies in the educational process of PhD candidates has not been sufficiently studied and developed. The researchers pointed out three levels of readiness of the education system to use remote learning technologies: the level of teachers (supervisors), the level of PhD students and the level of universities (Zvavahera & Masimba, 2019). As for other factors of distance learning in the paradigm of PhD candidates' training, in general, the situation can be described as an *antithetical dichotomy*. On the one hand, in terms of age, indicators of professional orientation, competence, professional self-determination and general conscious attitude to learning, this group of students is clearly the most profitable in the entire vertical of higher education. On the other hand, distance learning can be a challenge for future Doctors of Philosophy due to:

a) lack of skills in independent research (occurs due to the dominance of mostly reproductive activities within academic programs and curricula in undergraduate and graduate programs);
b) lack of initiative (due to the lack of attention to leadership qualities of students);
c) difficulties in optimizing the independent work of students in the triad of professional activity (for employed applicants due to balancing studies with employment responsibilities (Alhattab, 2021)) and household problems. Besides, many students at this level have their own families, which also require increased attention to combine learning, life and professional activities. This indicates the need to study the problems and further prospects for the development of distance education in the context of PhD candidates' training.

Distance learning technologies are playing an increasingly important role in modern society, and are successfully implementing the wider educational practice in the following forms: distance competitions, educational projects, distance courses, etc. (Kaliuzhka et al., 2020). Distance education, or distance learning, is an area of education that focuses on pedagogy, technology, and instructional systems aimed at delivering education to students who are not physically "on site" (UNESCO, 2010).

New terms are now emerging: online learning, digital learning, e-learning, and virtual learning, which are synonymous and interchangeable, and are only defining the mechanism of distance learning (Traxler, 2018), but also remote learning (O'Regan, 2020). The development of distance learning can be considered both as a direct consequence of digitalisation in higher education (Ilmarinem & Koskela, 2015) and the form of Emergency Remote Education (ERE) during the recent health emergency. However, it should be clearly stated that although the digitalisation of public life contributes significantly to the spread of distance learning, the idea arose to use distance learning in the 20s of the twentieth century (Sumner, 2000). According to other versions, in general, it was adoped in the 40s of the nineteenth century (Kurzman, 2013).

However, for the present study we are specifically interested not in the whole wide topic of distance learning and its peculiarities within multiply autonomous fields. We are concentrated on how distance learning influences the training of PhD candidates as a whole and within specialties of postgraduate studying and on the ways, techniques, and theoretical and practical bases of training PhD candidates remotely in order to achieve advanced educational goals. Therefore, the logic of organising the review of relevant literature is subjected to this goal.

It is also important to be aware that the quality of distance learning is highly dependent on the country in which the problem is being studied. For example, a UNICEF 2021 report noted that countries such as Benin, Burundi, Cote d'Ivoire, Congo, Ethiopia, Madagascar, Malawi, Niger and Togo need very significant changes in the education system, in particular with regard to remote format (Cornér et al., 2018; Alhattab, 2021; Cuschieri, 2021). When we talk about the experience of PhD candidates' training, we certainly mean in countries with good practices in the training of scientists. However, we understand that the national context is sometimes decisive in the practice and philosophy of the perception of distance education, as an alternative to traditional formats of educational interaction. Approaches to the organisation of distance learning for full-time and part-time doctoral candidates also needs differentiation (O'Regan, 2020; Alhattab, 2021).

The use of computer technology is dominant for remote education. And in the learning process of PhD candidates it has a positive effect on the quality of searching relevant information, using online platforms to interpret the data, organising online exploring activities and working with large volumes of information that is necessary in the process of working on an individual PhD scientific topic. Remote communication with the supervisor changes the standard roles of the participants of the educational process, though, not as crucially as it occurred within school, college or undergraduate educational levels (Gray & Crosta, 2019; Alebaikan et al., 2020). This is because in the framework of interaction between the PhD candidate and supervisor, it is a common practice to build it on the ground of learner = "knowledge coordinator" and supervisor = "mentor", "assistant" (rather than supervisors as so-called "hands-off supervisors" (Gruzdev et al., 2020)). Effective scientific/explorative oriented learning and writing a research paper requires a strong internal motivation from a postgraduate student. Lack of clear control and lack of self-organisation of postgraduate students may reduce the quality of distance learning. To measure the effectiveness of postgraduate research guidance, Gruzdev et al. (2020) introduce the concept of "shortest expected time-to-degree", according to which "superheroes" and "mentors" as similar styles of leadership show the best results. The results of previous studies show that time constraints, formal constraints, irregular contacts and technological difficulties are the main problems that PhD supervisors face. PhD student- and supervisor- interaction, diversity, perceptions, virtual communities, and academic collaboration are the biggest challenges for distance learning supervisors. Students' attitudes, supervisors' positioning manner, and organisation skills of both are the key success factors in remote research supervision (Zaheer & Munir, 2020).

Training of PhD candidates is difficult and stressful for postgraduate students (McCauley & Hinojosa, 2020) and is different from the training of undergraduate or graduate students. Postgraduate students have a significant psycho-emotional stress, so it is recommended to overcome it through the implementation of health and recreational technologies (Bugaychuk, 2015). They may find it difficult to communicate with professors and peers, and the impact and complexity of interaction are then greatly reduced (Wang & DeLaquil, 2020; Lekhetho, 2022). The postponement and cancellation of academic conferences is another aspect that has an immediate, medium-term, and long-term impact on graduate students and early-stage researchers (Al-Shahrani & Mohamad, 2018; Cuschieri, 2021). Therefore, it is important for supervisors to establish, albeit not as frequently as in full-time study, regular conferences with PhD candidates (Bireda, 2019). It is important that postgraduate students are ready for the conference: both on the amount of work on the dissertation, which has been set aside

since the previous meeting, and on questions to the supervisor. In this way, the conferences will be as productive as possible. Among other problems, Rockinson-Szapkiw & Watson (2020) also note the problems of combining distance learning and doctoral studies in educational programmes, managing their family and academic life.

We have mostly discussed the issues related to distance learning for future PhDs. However, it is the remote format that also offers several advantages. It is the opportunity to devote more time to the development of the topic, structure and content of research work, to explore more deeply the empirical material needed to prepare quality research. Besides, it is a chance to focus on research and becoming a scientist as opposed to having to spend a lot of time attending regular classes (for example, time on the way to university). Remote learning of PhDs means also greater autonomy in work, development of skills of self-control and a conscious approach to writing a work. One of the main advantages is the ability to live and even work in one country, and study on a postgraduate level in another one, organising all the necessary communication online (Cuschieri, 2021; Olszewska, 2020).

As a result, we want to summarise that, given the key points identified in the review of the literature on the topic, the quality of the relationship between supervisor and future PhDs is the key factor in the success of distance learning at the postgraduate level. Under such conditions, all other factors, including the frequency of contacts, lack of face-to-face interaction, formal and classroom organisation of the learning process, etc., recede into the background and are determined by the quality of the first factor. By means of proper cooperation with the supervisor, any disadvantages of distance postgraduate learning can, on the contrary, become advantages and significantly reduce "expected time-to-degree". Nevertheless, we aim to estimate the whole spectrum of multiple factors that influenced PhD training in the paradigm of remote learning.

Therefore, the sharp transition to distance learning, the peculiarities of the organisation of education at the third level of higher education, societal challenges and the relatively poorly explored subject of distance postgraduate learning determine the topicality and necessity of research, the main aim of which is to analyse the implementation of distance learning methods in the context of the COVID-19 pandemic. This aim involved the following objectives:

1) to investigate whether there is a difference in the adaptation of graduate students of different majors to distance learning technologies;
2) to identify the causes of problems in the implementation of distance education;
3) to identify opportunities for the implementation of promising areas of online learning in the system of training academic and teaching staff.

Materials and Methods

The study was organised in three stages during 2020-2021:

1. Theory and design
2. Experimental
3. Generalising.

Stage 1: Theory and Design

The first stage, *the theoretical and design stage* (January-May 2020) involved the selection, substantiation and theoretical understanding of the problem and research topic, as well as the study of the experience of implementing distance education in the pre-pandemic period. This stage was aimed at in-depth study of previous achievements of scientific practice in the field of distance learning for PhD students to identify those basic pillars that will be embodied in a further adapted experimental version. For the experimental model were taken all the positive vectors, practices, developments, which were summarised above in the literature review section. In addition, within the theoretical and design stage, the programme and methodology of the experiment were developed, namely a survey for graduate students based on the protocols of the focus group meeting.

Stage 2: Experimental

The second — *experimental stage* (June-December 2020) — provided for a survey of postgraduate students. The following are the main aspects that determined the features of the survey phase to collect empirical data for current scientific study.

Population and Sampling

According to the State Statistics Service of Ukraine (2019), 6,951 postgraduate students of all specialties were studying in Ukraine in 2020. These statistics made up the general population of our sample. To calculate the size of the required (representative) sample we used an online calculator (http://socio-lab.vntu.edu.ua/download/Calculator.html). Online calculator is a digital tool that, among other options, allows you to automatically and accurately calculate the number of respondents in the sample required for a demonstrative and scientifically reliable statistical study. The sample size was calculated taking into account the programmed confidence probability / accuracy (in our study – with a confidence probability of 97%; allowable confidence interval (error — 5%); and the general population (total respondents — 6,951 PhD students). Online calculator found that the size of a valid sample was 445 people.

The respondents of the study were postgraduate students majoring in 011 Educational, Pedagogical Sciences, 017 Physical Culture and Sports, 035 Philology, 091 Biology, who studied in the first year of the third level of higher education. In the structure of respondents, the first place was taken by students majoring in 011 Educational, Pedagogical Sciences (34.99%), the second — postgraduate students majoring in 035 Philology (33.33%), which was two-thirds of all respondents. Postgraduate students majoring in 017 Physical Culture and Sports and 051 Biology took the following places in the structure of respondents: 20.9% and 11.58%, respectively.

Experimental Background

The experimental background of the study was the Municipal Institution of Higher Education "Lutsk Pedagogical College" of the Volyn Regional Council (Council of Young Scientists), Makarenko State Pedagogical University of Sumy, Ivan Ziaziun Institute of Pedagogical and Adult Education of the National Academy of Pedagogical Sciences. The main study was preceded by a focus group meeting held as part of the preparation of the current research to determine the basic problems of distance learning of PhD candidates in the context of a pandemic. Focused group interview is a qualitative method of research, involving a group interview, organised in the form of a conversation of several respondents on a topic set by the interviewer-moderator. The meeting was attended by

representatives of the group of educational programmes of each major. This was the impetus for further development of the content of the survey of graduate students on the quality of distance learning.

Instrument

A survey of postgraduate students was conducted according to the objectives through specially-designed and semi-standardised interviews of focus groups of producers and consumers of educational services. While conducting the set of interviews, we took into account mostly the technics described by Merton et al. (1956) and Rädiker (2020). The aim was to assess the role and place of distance learning technologies in training future academic and teaching staff, as well as the possibilities of introduction of promising directions of online training in the system of the third-level higher education. The survey consisted of the following blocks of questions: assessment of postgraduate students' adaptation to the conditions of distance learning; assessment of the level of teachers' work; assessment of difficulties of remote work; technologies and means of distance learning.

Data Collection

The data were collected on a voluntary basis, with prior acquaintance of respondents with the objectives of the study, as well as information on how to fill out questionnaires that have both closed and open-ended questions. The surveys were conducted using the services of Google Forms, Survio, and Anketolog. Identical in structure and content, questionnaires were posted online in all three mentioned services. The respondent could choose any of them at their own discretion. Most of the questionnaires' responses (95.7%) received used Google Forms. Therefore, only this platform can be used in similar studies in the future, as the other two have proven ineffective for this study population. Technically and procedurally, Google Forms has proven to be the most successful. Meanwhile, these services helped to collect data during distance learning, and the survey results were automatically processed and presented in the form of visual generalised diagrams.

Stage 3: Generalising

The third — *generalising* — stage (January-May 2021) dealt with the processing of measurement data, and interpretation of statistical indicators. At this stage, the obtained results were compared with the expected ones and previous research on the selected problem; recommendations were developed and the results of the study were represented. The degree of satisfaction of consumers of educational services (future PhD candidates) in the context of distance learning was rated by the parameters of 1 to 5 points. Statistical processing of the material was performed in MS EXCEL. While generalising the data of interviews and interpreting them qualitatively we used the technics described by Reiter & Witzel (2021).

Findings

We planned and conducted a pedagogical experiment in accordance with the aim and objectives of our study.

Postgraduate students assessed the level of their adaptation to the conditions of distance learning while studying in the context of distance education (June-December 2020) (Table 1). The evaluation was performed on a 5-point scale to determine the arithmetic mean and standard error of the mean.

The standard error of the mean (SEM) is the standard theoretical deviation of all the average sample sizes extracted from the population. The standard error of the mean is calculated as follows:

$$SEM = \frac{s}{\sqrt{n}},$$

where:

s is the standard deviation calculated from the sample,
n is the number of observations in the sample.

Table 1: Assessment of adaptation of postgraduate students of different majors to distance learning technologies (rated from 1 to 5 points)

Major	**(M ± м)**
017 Physical Culture	3.55±0.11
091 Biology	3.49±0.09
035 Philology	3.68±0.15
011 Educational, Pedagogical Sciences	3.82±0.18
Total	**3.65±0.32**

When asked *how convenient it was to study in the context of distance technology*, more than 50% of respondents gave positive feedback. The postgraduate students noted that they began to fall behind less in the fulfilment of curricula in complex subjects; it became easier to pass a test and the exam; it became easier to deal with the scientific component of the educational programme; they found more opportunities to consult with their supervisor; there was more time for self-development, participation in conferences, training events, etc.), although 28.13% noted some difficulties in the transition to distance learning. Among the answers, the most common were allegations that postgraduate students began to postpone assignments for later, the motivation to write articles and abstracts decreased; the availability of consultations with their supervisor decreased, the lack of systemic mentoring by the supervisor reduced the effectiveness of writing a dissertation, etc.), and 21.75% could not answer the questionnaire.

In the answers of the respondents to the questions *about the use of distance education tools*, the electronic information environment of the university (77.3%), online lectures (YouTube) (77.5%), lecture presentations (48.2%), and Zoom sessions (39.4%) took the lead. At the same time, only 16.3% of the respondents indicated that they *used the full range of distance learning tools offered by the educational institution.* This means that a significant number of teachers do not use and do not motivate postgraduate students to use distance technology in full, teachers do not have sufficient experience and skills to use online educational resources. However, it is important that PhD candidates noted that they began to use specialised search engines to search for scientific information (CiteSeer, Google Scholar, Scirus, etc.), scientometric databases (Web of Science, Scopus, Google Scholar, RINC, Index Copernicus), and online education platforms (EdEra, WiseCow, Impactorium, etc.).

The first experience of conducting a survey of graduate students to identify problems that arise when working with e-courses and analysis of the point of view on the effectiveness of distance technology in the educational process will contribute to the development of the programme to improve e-learning technologies for postgraduate students who cannot attend classes “on site”, who conduct research or

experiments abroad, have difficulty moving, etc. The postgraduate students assessed *the ease of using the portal of the HEI's electronic information educational environment* on a 5-point scale at 3.41 ± 0.06 points, and the difference of the scores between the faculties was not significant ($p > 0.05$). The students assessed *the level of teachers' work on the implementation of distance learning* at 3.89 ± 0.05 points, while the assessments of postgraduate students of different educational programmes differed (Figure 1).

Postgraduate students majoring in 017 Physical Culture and Sports and 091 Biology rated the work of their teachers lower (3.82 ± 0.10 and 3.80 ± 0.08 points, respectively) than those majoring in 011 Educational Pedagogical Sciences and 035 Philology (4.04 ± 0.11 and 4.12 ± 0.13 points, respectively) ($p < 0.05$). We explain this by the fact that the majors 017 Physical Culture and Sports and 091 Biology are more practically oriented. Obtaining a degree in 091 Biology requires special material and technical resources for teaching and conducting experimental research, which greatly complicates the teacher's work and the possibility of effective virtual teaching. The educational programme in 017 Physical Culture and Sports is focused on conducting research in the following areas: sports; physical education, health-improving physical activity of various groups of the population, and requiring experimental work in the appropriate sports facilities, which were closed during the pandemic.

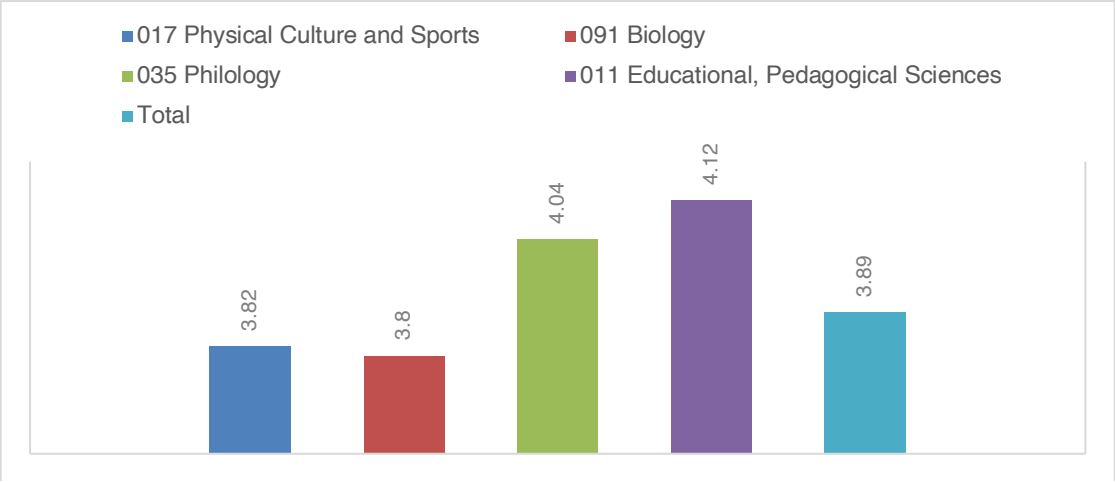

Figure 1: Assessment of the level of the teachers' work on the implementation of distance learning programmes for postgraduate students of different majors

The level of work of the Distance Education Department of the educational institution on the implementation of training in the context of a pandemic was assessed by postgraduate students at 3.47 ± 0.06 points, and no significant difference between different majors was found ($p > 0.05$). *The postgraduate students* assessed *the degree of difficulties they faced* at 2.82 ± 0.06 points, the respondents were unanimous in their assessments ($p > 0.05$).

A significant number of respondents faced *technical problems* during distance learning, including technical interruptions in the process of reproduction of material (55.79%), low internet speed (52.25%), and only 25.77% of respondents indicated the absence of technical problems (Figure 2).

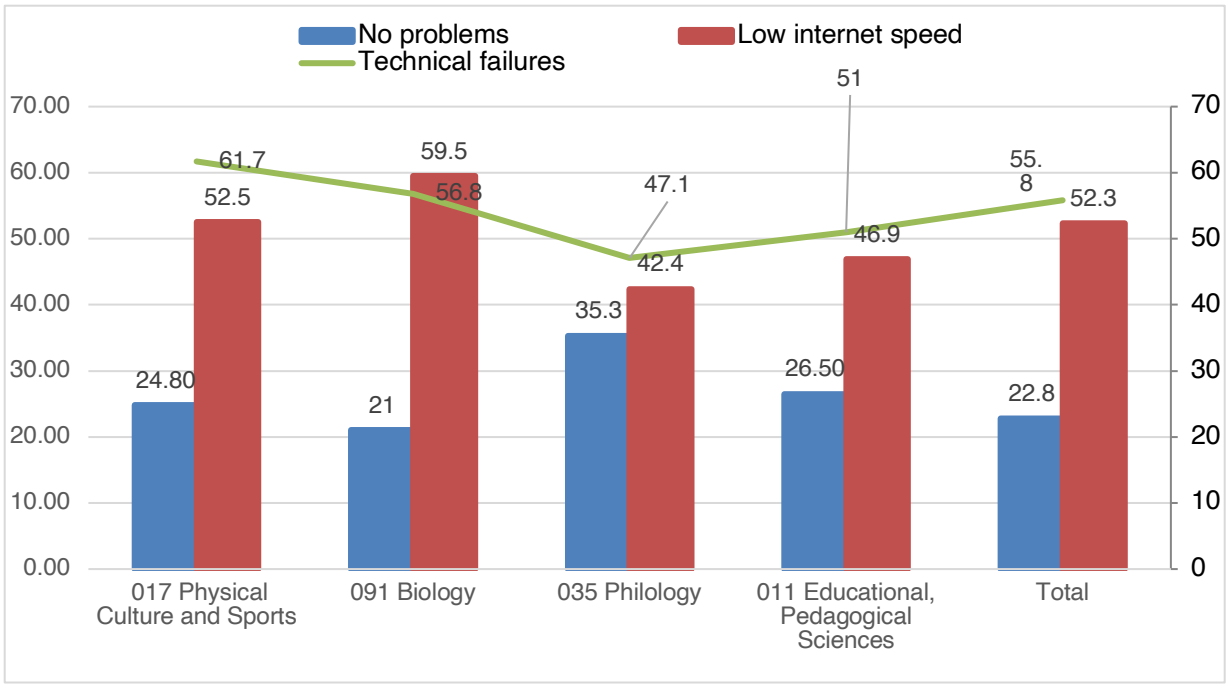

Figure 2: The main technical problems in the implementation of distance learning technologies according to postgraduate students of different majors

Moreover, 35.39% of postgraduate students majoring in 035 Philology indicated the lack of technical problems in the process of implementing distance education technologies. At the same time, only 20.95% of postgraduate students majoring in 091 Biology indicated the lack of technical problems in the process of implementing distance education technologies (Figure 3).

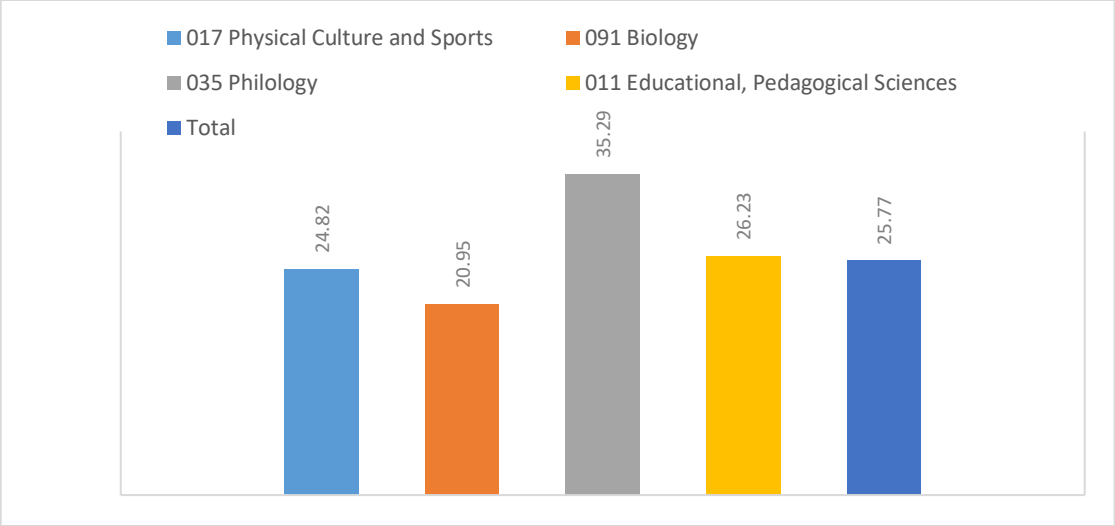

Figure 3: Lack of technical problems in the implementation of distance education technologies according to postgraduate students of different majors

A significant number of respondents *complained about the general issues of technical support of distance learning at the university level*. In particular, 44.44% of respondents indicated that there are difficulties in using the distance education website, while 38.77% could not answer this question. There were 16.55% of respondents who indicated the difficulty of updating the content of classes and the possibility of archiving educational material, 7.33% the unavailability to download any educational material, and 6.38% indicated that postgraduate students did not receive technical assistance despite repeated attempts to obtain it (Figure 4).

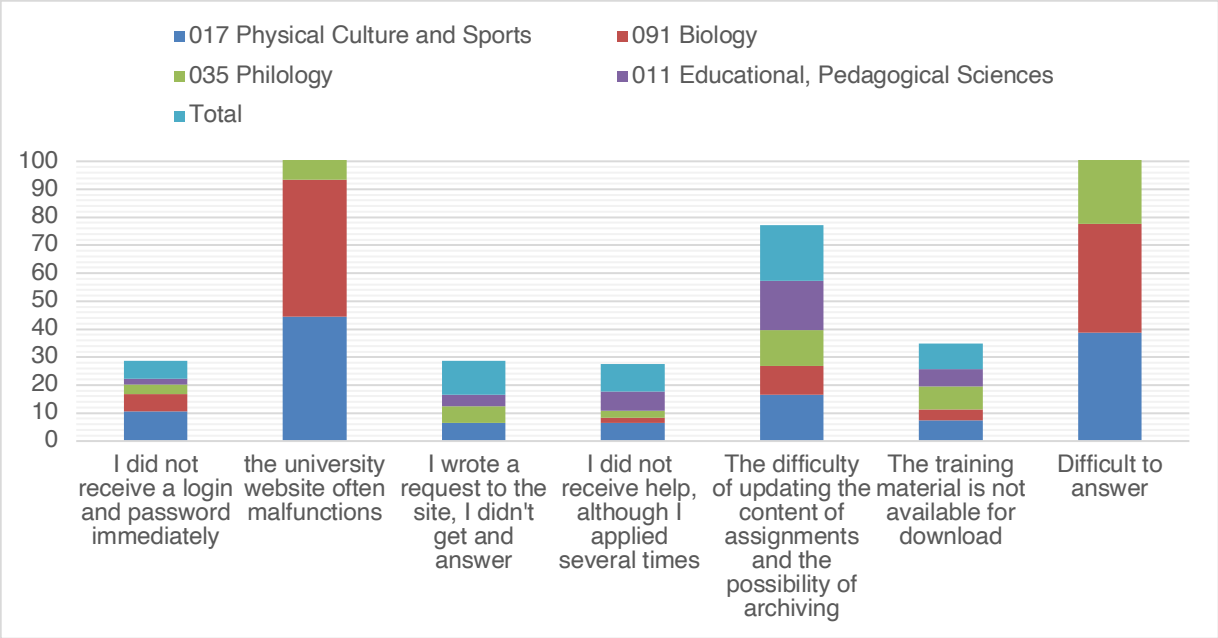

Figure 4: List of claims of postgraduate students to the technical support of distance learning

In our opinion, such frequent complaints about the technical support of the distance education process can be explained by the fact that materially and technically the universities were not ready to fully switch to distance education. The rating of claims, made on the basis of the analysis of questionnaires and interviews of focus groups of postgraduate students, is as follows:

1. The distance learning website constantly hangs, does not cope with volumes of users, reboot is required.
2. The Moodle platform is unstable, there are frequent software failures.
3. High level of problems with communication with teachers.
4. There is no stability of the feedback system between supervisors and postgraduate students.
5. There is no possibility of discussions of assignments for independent work with the teacher.
6. Many postgraduate students feel an acute lack of methodically developed material for writing a research paper, or practical recommendations.

In addition to technical problems during 2020, many postgraduate students lacked communication with groupmates, supervisors, face-to-face discussions with teachers, discussions of research results at the department supplemented by the complexity of distance learning and problems of concentration during self-study of educational material and writing a research paper.

When analysing the opinions of postgraduate students on distance learning technologies, the ranking of answers to the question of *what forms of work are most often used by teachers* is headed by the placement of educational materials on the educational portal of the educational institution (78.49%). The next places are occupied by giving out assignments for self-fulfilment (73.76%), online testing (60.99%), checking assignments for self-fulfilment (57.92%), conducting video classes (55.08%), and conducting individual lessons (14.66%) (Figure 5).

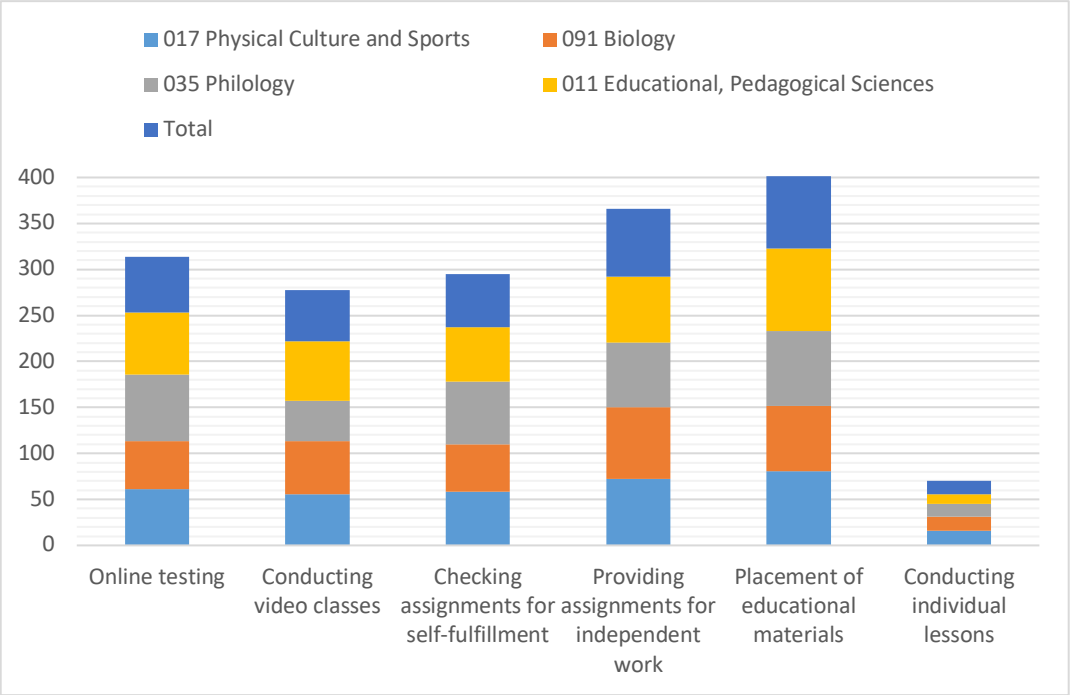

Figure 5: Variants of educational technologies the teachers use to conduct classes with postgraduate students in the context of distance learning

As for the *types of devices used by postgraduate students in the context of implementation of distance learning technologies*, the most popular were laptops and mobile phones — 78.01% and 82.03%, respectively. Personal computers (28.61%) and tablets (11.35%) were rated next.

The analysis of semi-standardised interviews of the focus groups of consumers and producers of educational services *on passing exams* showed that more than two-thirds of the postgraduate students were afraid of online exams, although more than half believed that their assessments during the online session would not change compared to the face-to-face ones. Meanwhile, according to a quarter of graduate students, the prevalence of dishonest behaviour during exams increased, although others believe that no change had taken place during the winter session. During the surveys, graduate students also noted the prevalence of plagiarism or other dishonest behaviour during the winter session.

Discussion

Answering the questions of our study, we note:

1. The study showed that there is a difference in the adaptation of postgraduate students of different majors to distance learning technologies. The representatives of the major 017 Physical Culture and Sports and 091 Biology found it more difficult to adapt to distance learning. This was also confirmed by studies that it is more difficult for the representatives of technical (Ishchenko & Horbunovych, 2021) and medical majors (Çifcibaşi et al., 2020), and applied majors in general (Zakharova et al., 2021) to adapt to the conditions of distance education. The data obtained were confirmed by a study by Ivanov and Tzankova (2020), stating that students are not inclined to replace practical activity with online theory. Online education significantly enriches students' knowledge but cannot replace practical activity. Thus, it is more difficult for graduate students of practice-oriented majors to adapt to the conditions of distance learning, but the use of this form of education for such majors is not only possible but necessary, however, with certain limitations. These limitations are because the development of professional competencies and training in practical skills requires traditional in-class education. All theoretical training and development of professional skills can be implemented remotely. This requires careful revision of the curriculum and the division of training programmes into distance and traditional "phases".
2. In our opinion, *the reasons for most problems* of distance education are high complexity associated with the need to create teaching materials for distance learning. But understanding that the cost of resources is offset in the future by reducing the time to successfully complete certain types of training, first of all, for teachers, should stimulate their further movement towards preparation of high-quality educational and methodical materials. This is also emphasised in other work (Pogodaeva et al., 2019) where the authors state that in their opinion, using identical pedagogical and didactic practices as in full-time education reduces the quality of distance learning.

   In our view, a significant disadvantage of distance education of PhD candidates is *the lack of a centralised system of certification and accreditation of electronic training courses for future academic and teaching staff*, resulting in many "electronic courses, textbooks, platforms, cases, etc.", which are actually ordinary digitised texts. An important factor hindering the more intensive introduction of distance technologies is the *lack of motivation of teachers* to work in this direction (Orhan & Beyhan, 2020; Giacosa, 2020). Moreover, the issue of the *shortage of teachers who could competently develop and implement distance learning courses* in higher education remains acute. Studies confirm the view that participants in the educational process do not have sufficient knowledge and experience in distance education. Besides, the problem remains urgent in the form of *technical difficulties*, troubleshooting equipment (failures in the transmission of sound, images, etc.), the full feedback between students and teachers, personalisation of materials, and implementation of the procedure for identifying postgraduate students (Aliyyah et al., 2020).

3. Eliminating the problem of implementing the methodological plan (the need to develop a large number of presentations, tests, assignments and other educational elements) in online education, as well as problems of the gap in the digital culture between younger and older generations, requires *retraining of a large proportion of the teaching staff*. This is also emphasised in studies by Budnyk et al. (2021) and Lane & Gregson (2019). It is important to train staff who can manage the educational process under the conditions of limited ability to influence the audience and the degree of control over the involvement of postgraduate students in the process of developing professional competencies.

   We believe that *a systemic approach* to the development of the online environment of educational institutions will reduce the significance of the shortcomings of distance education. Research has shown that digital technologies and tools significantly expand the use of innovative teaching methods, but postgraduate students and teachers need to *develop skills and abilities to use educational content, skills in finding scientific information, as well as to promote academic integrity*. The market for the training of PhD candidates should be filled with quality online educational products, so it is important to create certified training courses in the future, especially for subjects of general fundamental training of postgraduate students (Philosophy, foreign language, Ukrainian language, etc.).

   In our opinion, it is important *to develop a strategy for the implementation of distance education of PhD candidates, taking into account the specifics of their majors,* at the regulatory level. According to a study by Shkabarina et al. (2021), which indicates the effectiveness of interactive methods in distance education, we propose to use modern innovative technologies for the training of PhDs.

Research Limitations

The main limiting factor of the study is that the experimental work was conducted only for postgraduate students majoring in 011 Educational, Pedagogical Sciences, 017 Physical Culture and Sports, 035 Philology, 091 Biology. Another limiting factor is the formative experiment carried out only during the first session of postgraduate students in the first year of study.

Conclusions

The problem of distance education for PhD candidates is topical in the system of higher education. The COVID-19 pandemic was the main stimulus for the development of distance learning, so the education system faced the need to urgently adapt the existing third-level educational programmes to distance format. The study revealed the challenges that the institution faced in the transition to total distance education of PhD candidates in the context of a pandemic.

The experiment allowed us to conclude that distance education provides the development of the author's position on training PhD candidates: the acquisition of skills of independent choice of research methods, improving the theoretical level of training, and independently searching for resources and methods of work. The postgraduate student becomes the author of his/her own individual educational programme and research, which most postgraduate students were not ready for.

The lack of a systemic digital educational environment in most HEIs does not allow for the modernisation of the process of training PhD candidates. In real practice, remote technologies do not provide the same quality and efficiency of the result as the traditional forms of training the PhD candidates, especially in the case of practice-oriented majors.

The practical significance of the study is that the identified challenges and contradictions in the training of PhD candidates in distance education allow identifying mechanisms and technologies to optimise the implementation of online learning in HEIs. The obtained data can be useful for heads of postgraduate and doctoral departments, heads of distance education departments, heads of educational quality assurance centres, teachers and research supervisors of postgraduate students.

It is difficult to cover all the challenges faced by higher education in the total transition to distance education in a pandemic in one study, so the prospects for further research are the study of problems of addressing the level of academic integrity of future academic and teaching staff during distance learning.

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