METHODOLOGICAL PRINCIPLES FOR ENSURING THE ASSESSMENT OF EDUCATIONAL ACHIEVEMENTS IN HIGHER EDUCATION UNDER THE CONDITIONS OF DISTANCE EDUCATION

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Abstract: The article examines the opportunities for organizing the educational process, specifically focusing on the control and assessment of educational achievements of higher education students in distance learning conditions. The relationship between assessment in traditional and distance learning conditions is discussed. The quality and effectiveness of modern distance education are analyzed. Scientific approaches and perspectives regarding the main criteria for evaluating the quality and effectiveness of training in remote settings are revealed. The role of digital technologies in organizing effective training is highlighted. As part of the research, a survey was conducted at the initial stage of the experiment. The survey aimed to determine the frequency, methods, and forms of current and final assessment of student learning outcomes in distance education; identify preferred means and tools for evaluating distance learning results used by teachers; elucidate the peculiarities and main difficulties in organizing the evaluation of future specialists' training results under martial law; and identify changes in assessment procedures and approaches to selecting evaluation methods. An analysis of the main difficulties complicating the implementation of assessment procedures in wartime conditions was carried out. The directions and prospects for improving the mechanisms for evaluating the results of distance learning for future specialists are outlined. The development of digital literacy among teachers and future specialists is justified, as well as the need to create didactic support for online learning integrated into a single educational and methodological complex.

Keywords: distance education; interaction; effectiveness of training; educational process; quality of educational services; information technologies; students; innovations; means and tools for evaluation of training results.

1 Introduction

In modern conditions, the accelerated development of digital technologies in the 21st century has significantly influenced the modernization of Ukraine's educational system. This transformation is reflected in the Concept of the Development of Distance Education, which encompasses broad sections of society and has become a crucial factor in its progress. The active implementation of digitization and the expansion of distance education have permeated all spheres of human life. Given the need for prolonged and systematic suspension of in-person education due to quarantine restrictions from the COVID-19 pandemic and the full-scale armed aggression of the Russian Federation against Ukraine, distance learning plays a major role in accessing educational services [15].

It is believed that the first attempt to create a form of distance education was made by John Comenius 350 years ago when he introduced illustrated textbooks into widespread educational practice. He also laid the foundation for using a systems approach in education by writing his Great Didactics. Many researchers recognize him as the founder of distance education. At the end of the 19th century, "correspondence" training emerged as the forefather of distance education. Students could send their written work to the teacher, receive feedback, and obtain new materials by mail. These changes were facilitated by the advent of regular postal communication. This method of education was especially favored by those living far from big cities, for whom it was often the only opportunity to receive a serious education.

Today, a wide range of digital tools and educational resources are employed to organize distance learning. Their selection depends on the level of digital competence among the participants in the educational process, the functionality of their gadgets, access to high-speed Internet, and other factors. However, the use of specific electronic means affects the effectiveness of distance learning, the organization of result evaluation, and the ability to make timely adjustments in the educational process [8].

Therefore, the issue of organizing distance learning in higher education institutions, using digital tools for its implementation, and their impact on evaluating learning outcomes is gaining relevance. Despite numerous works on the quality of distance learning implementation in Ukrainian higher education institutions, there are no experimental studies on the practice of using tools to evaluate student performance in distance learning conditions.

The purpose of this study is to experimentally examine the methodological principles for organizing the assessment of educational achievements of higher education students under quarantine restrictions and martial law.

The tasks to be addressed during the research are as follows:

1. To analyze the current state of distance education organization methods in Ukrainian higher education institutions in the context of digitalization.
2. To develop a methodology for improving distance education under digitalization conditions.
3. To test methods for increasing the effectiveness of distance education in a digitalized environment.

Addressing these tasks during the research will allow for more effective organization of the educational process in Ukrainian higher education institutions in a distance format, considering the labor market requirements for specialists in the field of pedagogy.

2 Method

In the process of experimental research, the following methods were used: analysis, synthesis, comparison, systematization, and classification. These methods facilitated a theoretical analysis of problems related to the use of modern digital technologies in distance education. The study also involved a review of philosophical, psychological, pedagogical, and methodological literature based on state standards of higher education, educational programs for training future specialists in pedagogy, working curricula, and educational and methodological complexes of professional disciplines for various specialties. Additionally, the research summarized the experience of using digital technologies in higher education institutions and involved conducting an experiment, including ascertaining, formative, and control stages, to test the proposed methodological system aimed at enhancing digital competence in distance education.

The experimental study was conducted at Oleksandr Dovzhenko Hlukhiv National Pedagogical University during the 2022-2023 academic years. The sample size was 86 future teachers, with 42 respondents in the control group and 44 participants in the experimental group, comprising 46 women and 40 men. The results of the experimental studies were evaluated at high, medium, and low levels.

At the ascertainment stage of the experiment, a contingent of respondents in similar conditions (study course, educational program, etc.) was determined. A questionnaire was conducted to diagnose future teachers' awareness and use of digital technologies. This stage also involved analyzing literature on the research problem, selecting methodological tools to support the

use of digital technologies in the educational process, and studying best practices in digital technology methodology.

A comparative analysis of the scientific base on the research problem was conducted, along with systematization, classification, and generalization of theoretical data. The method for developing digital competence in future specialists within the context of distance education in higher education institutions was developed.

At the formative stage of the experiment, specialized methods for forming digital competence components were implemented in the experimental group under distance education conditions in higher education institutions at all stages of the experiment.

Based on the analysis of experimental data, it was concluded that the levels of digital competence formation among future specialists in distance education increased during the formative stage of the experiment. This finding supports the effectiveness of the outlined methodology.

At the control stage, the results were analyzed, and the qualitative and quantitative indicators of the pedagogical experiment were calculated using the Wilcoxon-Mann-Whitney criterion. The data were generalized, conclusions were drawn, and prospects for further research were outlined.

3 Results and Discussion

Theoretical foundations of research

The history of distance education has Soviet roots. During interactions between the countries of the former anti-Hitler coalition, British scientists became interested in the Soviet experience of organizing correspondence education. Consequently, Britain decided to establish a similar education system, allocating significant funds for the project. Curricula, programs, teaching-methodological manuals, and educational technologies were developed.

Prime Minister Harold Wilson took personal control of the project for the world's first distance education university, the Open University. The university was founded by the Queen herself, and the Speaker of the House of Commons was appointed Chancellor (Rector). Every effort was made to ensure the university was both massive and prestigious.

On this basis, the Open University of Great Britain began to function and remains one of the world leaders in distance education. Annually, 200,000 people study there. The Open University was named to reflect its accessibility due to its low cost and the minimal need for classroom attendance.

Initially, adopting Soviet ideas, the British restricted the system to UK citizens only. However, after a few years without protests or lawsuits from the Soviet Union, the British began accepting distance education applications from foreigners as well.

Prime Minister Harold Wilson originally envisioned the institution as an "air university," with television and radio delivering teachers to students' homes. Later, the idea to use regular mail emerged. By the late 1990s, it became possible to deliver educational materials more cheaply and efficiently via e-mail.

Correspondence education evolved from attempts to improve the quality of distance education, combining elements of correspondence and face-to-face learning.

The French National Center for Distance Learning (CEND) was founded in 1969. Its scope includes 2,500 training courses, 350,000 users, branches in 120 countries, and 5,000 teachers developing courses and educational activities. CEND utilizes satellite television, video and audio cassettes, e-mail, the Internet, and traditional literary sources.

Other established centers of distance education in Europe include Spain's National University of Distance Education (UNED), with 58 study centers in the country and 9 abroad, and the Baltic University (BU) headquartered in Stockholm, which unites 10 countries in the Baltic region.

In 1989, the public television broadcasting system (PBS TV) was created in the USA, a consortium of 1,500 colleges and television companies. PBS TV broadcasts several educational programs on four educational channels, with a special focus on the adult learning program (PBS Adult Learning Service), offering courses in various fields of science, business, and management.

Today, Penn State University is recognized as one of the most authoritative institutions in distance education. Its experience was utilized by UNESCO in creating the concept of a virtual university.

Distance education business programs account for 25% of all distance education programs in America. Companies such as General Motors, JC Penny, Ford, Wal-Mart, and Federal Express conduct staff training through private corporate educational networks. IBM uses an internal satellite educational network for these purposes.

Distance learning is a priority in the modern educational policy of Ukraine. The use of digital distance learning technologies should adhere to high standards of quality and efficiency, enabling the organization of a high-quality educational process [5].

In pedagogical practice, the concepts of "distance education" and "distance learning" are distinct. In the scientific and pedagogical context, distance learning is understood as an independent pedagogical technology based on controlled and didactically supported independent work using modern digital tools. Distance education, however, refers to the process of educational interaction between the teacher and students, which occurs remotely using digital technologies. The primary goal is the formation of professional knowledge and competencies in professional disciplines [7].

From the retrospective analysis of the emergence of distance learning, it is known that such learning originated and spread in Western countries as early as the early 1970s. The active development of digitalization at the turn of the 20th and 21st centuries led to the widespread use of online technologies.

Today, higher education institutions in Ukraine actively use online platforms for training specialists in the pedagogical field, including Moodle, Google Classroom, Microsoft Teams, Google Meet, and Skype.

These platforms create an information space that allows participants in the educational process to work in a coordinated manner, remotely access educational and methodological materials, and assess the competencies acquired by students. In training future teachers, online platforms facilitate various forms of education, such as consultations, individual classes, independent work, project work, video conferences, online classes, and audio recordings [11].

Evaluating the educational achievements of future teachers in distance learning conditions is crucial. As the organization of the educational process evolves, there is a need to update learning technologies accordingly.

After the outbreak of the COVID-19 pandemic and the full-scale invasion of Russian Federation troops into Ukraine, the usual work schedule of educational institutions at all levels—preschool, primary, general secondary, pre-university, and higher education—was disrupted. Teachers and lecturers faced the challenge of organizing the educational process under new conditions. The importance of finding new technologies and forms to ensure the effectiveness of the educational process has become paramount [4].

The key to successful distance learning lies in the cooperation between teachers and students and among students themselves. Ensuring dialogic communication between these groups fosters the assimilation of material through constant interaction, mutual consultations, and joint discussions of scientific issues.

Based on the analysis of psychological and pedagogical literature, the following technologies were identified for the high-quality implementation of distance learning: "Idea Mixer," GROW, blockchain, longread, geocaching, educational web-quest, and sample technologies.

The existing system of monitoring students' educational achievements, implemented under the credit-modular learning technology, forms the basis for evaluation in distance learning. However, it requires adjustments. We propose maintaining the general control scheme for distance learning—introductory, intermediate, and final control—while making necessary additions at each stage [10].

Special importance should be given to continuous assessment, which should incorporate methods such as peer evaluation, writing letters to prominent scientists explaining their theories, composing creative works on discipline-related problems, and developing plans for further research on specific issues. Each task is assigned a certain number of points based on its complexity.

Particular attention should be paid to the peer assessment method, where students are divided into pairs to complete tasks, exchange their work for review, and then assess each other's work. The teacher checks both the answers and the quality of the peer review, assigning two marks (one for the answer and one for the accuracy of the review). This method fosters a more diligent approach to classes and systematic preparation.

Formative assessment is a popular method of evaluating educational achievements, used both abroad and in Ukraine [1]. The formative assessment method for evaluating the readiness of future teachers for professional activity considers it as a structured system where all components are interconnected. This evaluation system targets professional competence, pedagogical skills, the ability to perform professional tasks, the degree of mastery of effective pedagogical skills, personal abilities, and the presence of essential personal and professional qualities relevant to achieving pedagogical goals. This form of assessment is recommended for blended learning environments, incorporating both traditional and digital technologies. When conducting formative assessment, it is recommended to clearly define the educational tasks of learning, introduce digital tools, online applications, cloud services, and utilize various online platforms and digital technologies to adapt students to new learning conditions [16].

The tasks of formative assessment include establishing the relationship between the goals, tasks, methodological approaches, didactic principles, components, criteria, forms, methods, and means of the educational process, as well as various types of technologies. Formative assessment provides information about the effectiveness of the educational process under the influence of external and internal factors. While the totality of introductory, intermediate, and final control characterizes the educational achievements of future specialists, formative assessment provides a measure of the effectiveness of the educational system in training future teachers. Research by scientists has identified both positive and negative aspects of such assessment.

According to C. Pirrone, D. Di Corrado, A. Privitera, S. Castellano, and S. Varrasi [14], "formative assessment has a positive effect on the motivation and academic success of students and is characterized as a constant and integral process, whose main task is to determine current successes, achieve expected educational goals, and minimize the gap between the actual and the desired outcomes."

K. Bozgun, A. Ozaskin-Arslan, and Ş. Uluçinar-Sağir [3] view formative assessment as a tool for evaluating both the personal and general achievements of future teachers, the degree of improvement in professional competences, and readiness for professional activity. Since formative assessment concerns all components of professional training and is an integrated assessment, it encourages students to develop reflexive independence, cooperation, and constant monitoring of individual achievements, which allows for the adjustment of training results based on individual needs.

Research has shown that the information system for evaluating students' achievements during the study of module topics is highly beneficial. Points awarded to students in classes are freely accessible, allowing students to regulate their learning pace. This depends on the assessment that satisfies them. This transparency ensures that students are aware of the results expected by each member of the group, guaranteeing fairness in the final scoring stage and eliminating the possibility of favoritism.

Under the conditions of credit-module technology, formative assessment allows for the consideration of the professional qualities of future teachers, stimulates the development of creative abilities, regulates the practical preparation of students for future professional activities, and determines the effectiveness of pedagogical technologies [9].

The implementation of formative assessment will contribute to: – the acquisition of fundamental professional knowledge by future teachers; – the development of a sustainable desire for creative activity and the construction of an individual scientific trajectory; – the expansion of the practical focus of training and the determination of one's own capabilities as a future teacher; – the formation of skills to master innovative means and methods of professional development for evaluating achievements at each stage of education [12; 6].

In addition to the above, online learning offers opportunities to: take online tests to assess knowledge, use online simulators for grammar and vocabulary learning, use photo, video, and audio materials from YouTube for better understanding of the material, watch demonstrations conducted by the teacher, communicate with the group in real time, complete test tasks with instant results, work online with textbooks in PDF format, connect to sites related to the lesson, and receive feedback usually in the form of audio messages and mini-projects.

Empirical component study

An experiment was conducted to assess the readiness of higher education students to evaluate educational achievements in the context of distance education. The sample comprised 62 students from Oleksandr Dovzhenko Hlukhiv National Pedagogical University. The control group included 30 respondents, while the experimental group consisted of 32 participants. Groups were formed through pairwise selection. The experiment took place during the 2022-2023 academic year.

The research involved an analysis of the existing system for evaluating educational achievements of higher education students and explored potential improvements. A questionnaire was administered focusing on five key aspects: systematic control, transparency of evaluation, primary types of control, evaluation schedules by modules, and shortcomings of the evaluation system in distance learning.

The results revealed that an important issue is the use of online tests as an objective tool for assessing learning outcomes. To ensure the reliability of test performance without external assistance, it is recommended to utilize a web camera. This setup allows teachers to promptly receive student responses, offer necessary clarifications, and provide explanations and didactic materials for challenging questions. Furthermore, various evaluation methods and forms should be employed during distance learning (e.g., tests, oral surveys during online lessons, peer evaluations, group work assessments). Continuous monitoring of academic progress is essential.

Thus, the role of the teacher in distance learning should extend beyond mere oversight of academic integrity. Teachers should organize evaluations to motivate students to enhance their educational achievements and engage in self-directed learning. Contemporary educational research indicates that evaluation should be ongoing, providing feedback to both students and teachers about achievements and challenges, thereby facilitating improved student success.

Based on this, the research focused on: (1) identifying the forms and frequency of current and final evaluations of learning outcomes for higher education students under distance education conditions; (2) clarifying teachers' preferences regarding assessment tools and instruments; (3) identifying the main challenges in organizing the evaluation of higher education students' results under martial law in Ukraine and how these procedures differ from those in quarantine conditions; and (4) analyzing the dynamics of educational achievements and the objectivity of assessments.

To assess the evaluation of educational achievements among higher education applicants, a survey was conducted. The results revealed that approximately 89.4% of respondents reported conducting thematic assessments, while 10.6% of respondents did not perform any assessments. The survey results are illustrated in Figure 1.
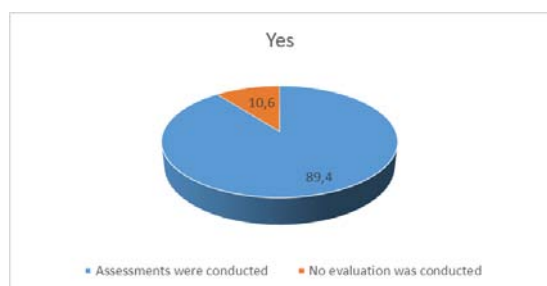

Figure 1. Availability of assessment in distance learning conditions

The frequency of current assessments of learning outcomes for higher education students under distance education conditions was categorized into the following indicators: at each lesson, once a week, two or more times a week, monthly, or occasionally not at all. The periodicity of these assessments is illustrated in Figure 2.
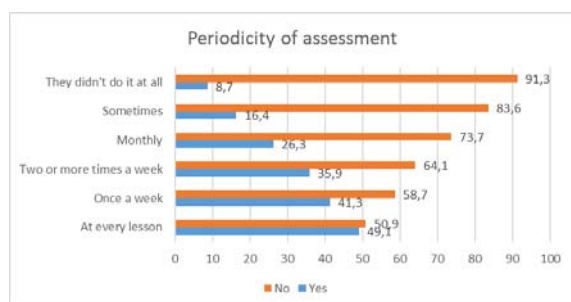

Figure 2. Periodicity of assessment of learning results of higher education applicants in the conditions of distance education

The distribution of responses among participants was as follows: 49.1% of higher education students reported that they conducted current assessments during each lesson, 41.3% did so once a week, 35.9% assessed students two or more times a week, 26.3% did so monthly, and 16.4% sometimes conducted assessments. Additionally, 8.7% of higher education students indicated that no assessments were carried out at all. This data suggests that, during quarantine and martial law conditions, over 80% of educators implemented ongoing assessments systematically (either during or after each lesson). Conversely, approximately 3% of educators did not conduct current assessments, according to the responses of higher education students.

To determine the methods and tools used for current and final evaluations of professional competencies in distance education, a questionnaire was administered. The results of this questionnaire are presented in Figure 3.
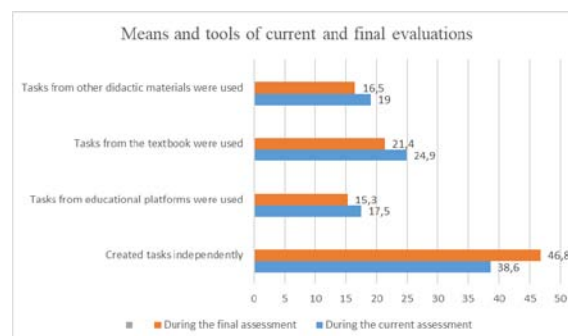

Figure 3. Means and tools of current and final evaluations

According to the survey results, a majority of teachers independently developed tasks for both current and final evaluations of higher education students' learning outcomes, both during quarantine and under martial law (38.6% and 46.8% of respondents, respectively). Teachers widely utilized tasks and tests available on online educational platforms for current and final evaluations, with 17.5% and 15.3% of respondents using these resources, respectively. For current evaluations, only 19.0% of teachers used tasks from textbooks, while 16.5% utilized tasks from other didactic materials. The results of the questionnaire are illustrated in Figure 4.
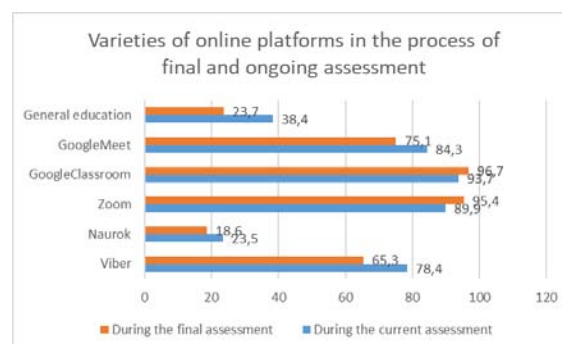

Figure 4. The most popular tools and evaluation tools

The next indicator assessed in the survey was the variety of online platforms used for conducting current and final assessments. The most favored platforms were Google Classroom (93.7% and 96.7%, respectively), ZOOM (89.9% and 95.4%), Google Meet (84.3% and 75.1%), Viber (78.4% and 65.3%), Vseosvita (38.4% and 23.7%), and "To the Lesson (Naurok)" (23.5% and 18.6%, respectively).

These tools were extensively utilized by teachers not only for current and final assessments but also for the overall organization of distance learning. Initially, during the quarantine period in 2020, teachers primarily used Viber, Skype, the educational institution's website, e-mail, and YouTube. In 2021–2022, the usage shifted to Viber, ZOOM, "Naurok" (To the Lesson), and Vseosvita. While social networks and services were predominant in 2020, the years 2021–2023 saw a significant increase in the use of online educational platforms that provide didactic materials and are frequently updated. For instance, platforms such as Learning Apps (Learning.ua) offer functionalities for posting author tasks for current and final assessments.

Services such as All-Ukrainian School Online, My Class, ClassDojo, Classtime, Learning Apps (Learning.ua), Telegram, Facebook, Microsoft Teams, Moodle, Khan Academy, Padlet.com, GIOS, Liveworksheet, Human, and Wordwall were

found to be less popular among teachers for current and final evaluations.

The analysis of the survey results indicates that Viber, "Naurok" (Naurok), Google Classroom, Google Meet, Vseosvita, and ZOOM are the most frequently used tools for organizing and conducting current and final evaluations. The prominence of Google Meet and ZOOM underscores the increasing importance of synchronous learning sessions.
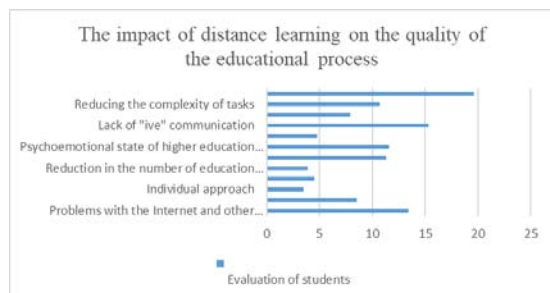

Figure 5. Impact of distance learning on the quality of the educational process

Based on the survey analysis, it was determined that under distance education conditions, the level of educational achievement among students has significantly decreased. This decline in achievement is attributed to reduced motivation, which is linked to the psycho-emotional state of higher education students, a lack of face-to-face communication, and heightened anxiety due to the current circumstances. Teachers face several challenges in organizing evaluations for distance learning, including inadequate high-speed internet, biased evaluations, and a reduction in student numbers.

The research revealed that at the onset of the COVID-19 pandemic (spring-autumn 2020) and the full-scale armed aggression by the Russian Federation against Ukraine, distance learning primarily relied on asynchronous interactions between students and teachers. Over time, synchronous learning gained popularity, even under martial law, as evidenced by the use of platforms such as ZOOM and Google Meet [13].

However, the quality of synchronous instruction is significantly impacted by wartime conditions. The deteriorating security situation can lead to disruptions or postponements of classes, complicating task completion and evaluation of learning outcomes. Security factors, such as night air raids, adversely affect the psycho-emotional state of higher education students, diminishing their motivation and academic performance. Some students are only able to complete mandatory tasks (primarily tests) without participating in online classes.

Access to synchronous education is not available to all higher education students. This is particularly true for those residing in occupied territories, combat zones, or de-occupied areas with damaged infrastructure. Additionally, students forcibly relocated abroad face challenges such as time zone differences and increased workloads from local educational institutions.

Under these conditions, creating an effective assessment framework for synchronous learning becomes highly challenging. Teachers often adopt a more lenient approach, offering simpler tasks, extended deadlines, and opportunities for resubmission, which can compromise the objectivity of the assessment.

The study identified that a priority for the development of the distance learning system for higher education students is the enhancement of assessment tools and the development of didactic support to improve objectivity.

4 Conclusion

The results of the experimental study indicate that the experience gained by Ukrainian teachers during the organization of distance learning amidst the quarantine and the full-scale armed aggression by the Russian Federation against Ukraine has provided a foundation for the successful implementation of student evaluation during martial law. This process is recognized as a crucial and integral aspect of the educational framework. A key factor contributing to success is the high level of motivation among teachers to engage effectively with higher education students, despite challenging external circumstances and the emotional and psychological state of the educational participants.

However, the research identified certain obstacles to the full execution of evaluation functions in distance learning under martial law. These include difficulties with internet access, such as unstable connections or the complete absence of internet service, as well as insufficient technical resources, as not all students and teachers have access to computers, tablets, or smartphones necessary for online learning. Additionally, the low level of digital literacy among some teachers and students further complicates the use of digital tools.

Addressing these issues involves several urgent tasks: development of digital literacy: both teachers and students need training to effectively use digital technologies for organizing the educational process; improvement of assessment task systems: tasks should emphasize the application, analysis, synthesis, and creation of new knowledge rather than mere reproduction of information; professional development of teachers: training programs should include modules on developing and utilizing test tasks and methods for assessing learning outcomes [2].

The research also found that, under martial law and forced displacement, access to didactic materials becomes limited. Not all students have access to paper textbooks, which might have been left behind in abandoned homes. Conversely, during power and internet outages, paper textbooks can serve as a critical source of knowledge.

Both international and domestic practices suggest that a blended approach to assessment (combining synchronous and asynchronous methods), along with the extensive use of self-assessment and peer assessment, is optimal. These methods require continued support and attention from educators.

The study revealed distinct changes in the implementation of educational assessment compared to previous periods. Despite challenging conditions, there is a noticeable trend towards an increased emphasis on synchronous assessment, reflecting teachers' recognition of their role in providing feedback and enhancing educational engagement.

The sociocultural and humanistic orientation of the distance learning system aligns with prevailing trends in global education. The global emphasis on the humanization of education, and distance learning systems in particular, indicates a steady increase in the prestige and demand for distance learning in the coming years. Educational institutions must address this trend by considering the evolving demands of educational service consumers concerning technology, quality, and the flexibility of the education provided.

Simultaneously, many educators have observed a decline in the educational achievements of higher education students during martial law. There are also concerns regarding inflated assessments. Future research should focus on clarifying objective indicators of the educational process, such as the duration of synchronous and asynchronous modes, the number of connections, and the timeliness of task submissions. Additionally, it is important to assess the real level of educational achievements while accounting for educational losses. This approach will aid in identifying effective mechanisms for compensating these losses.

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