



**DNIPRO UNIVERSITY**  
of **TECHNOLOGY**  
1899

# NAUKOVYI VISNYK

Natsionalnoho  
Hirnychoho Universytetu

Peer-reviewed  
journal

**1** 2024

199

Geology

Mining

Solid State Physics, Mineral Processing

Geotechnical and Mining Mechanical Engineering,  
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Electrical Complexes and Systems

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The journal has been included in SciVerseSCOPUS, Index Copernicus Journal Master List, ProQuest, EBSCOhost, Ulrichsweb Global Serials Directory, ResearchBib, Ukrainika naukova, Dzherelo.

Subscription for the journal can be done in post offices of the Ukraine (subscription index in Subscription Publication Catalogue is 89166) and in the subscription agencies Ukrinformnauka (index in Subscription Publication Catalogue is 10107) and Ideia (index is 17736)

Makeup T. A. Klimenko. Proofreading M. T. Sysun.  
Passed for printing under recommendation of Academic Council of Dnipro University of Technology (transaction No. 3 dated February 15, 2024).

Certified by Ministry of Justice of Ukraine. Registration number KB No. 24305-14145PR dated December 27, 2019. Passed for printing February 26, 2024. Sheet size 60 × 90/8. Presswork 23.3. Offset paper. Number of copies printed 200. Order No. 1.

Founder and publisher Dnipro University of Technology, Dnipro  
Certificate of Publisher ДК No.1842 dated June 11, 2004

Address of publisher and editorial office: 19, D. Yavornytskoho Ave., building 3, room 24a, Dnipro, 49005  
Tel.: (056) 373 08 65, e-mail: nv.ngu@ukr.net, www.nvngu.in.ua; nv.nmu.org.ua

Production PP KF "Gerda". 60, D. Yavornytskoho Ave., Dnipro, 49000.  
Certificate of Publisher ДК No.397 dated April 3, 2001



ДНІПРОВСЬКА  
ПОЛІТЕХНІКА  
1899

# НАУКОВИЙ ВІСНИК

Національного  
гірничого університету

Рецензований  
журнал

**1** 2024  
199

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	Журнал включено до міжнародних наукометричних баз SciVerseSCOPUS, Index Copernicus Journal Master List та баз EBSCOhost і ProQuest, каталогів періодичних видань Ulrichsweb Global Serials Directory та ResearchBib, реферується в базі даних «Україніка наукова», у журналі «Джерело».
	Передплата здійснюється в поштових відділеннях України за «Каталогом періодичних видань» (передплатний індекс: 89166) і в передплатних агентствах «Укрінформнаука» (індекс: 10107) та «Ідея» (індекс: 17736).
	Комп'ютерна верстка Т. О. Клименко. Коректор М. Т. Сисун. Журнал підписано до друку за рекомендацією вченої ради Національного технічного університету «Дніпровська політехніка» (протокол № 3 від 15.02.2024 року)
Журнал зареєстровано	у Міністерстві юстиції України. Реєстраційний номер КВ № 24305-14145ПР від 27.12.2019. Наклад 200 прим. Зам. № 1. Підписано до друку 26.02.2024. Формат 60 × 90/8. Ум. друк. арк. 23,3. Папір офсетний.
Засновник та видавець	Національний технічний університет «Дніпровська політехніка», м. Дніпро. «Свідоцтво суб'єкта видавничої справи» ДК №1842 від 11.06.2004
Адреса видавця та редакції:	49005, м. Дніпро, просп. Д. Яворницького, 19, корпус 3, к. 24а Тел.: (056) 373 08 65, e-mail: nv.ngu@ukr.net; www.nvngu.in.ua; nv.nmu.org.ua
Виготовлення:	ПП КФ «Герда». 49000, м. Дніпро, просп. Д. Яворницького, 60. «Свідоцтво суб'єкта видавничої справи» ДК №397 від 03.04.2001

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*“Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu” is included in the Category A of the “List of Scientific Professional Editions of Ukraine” on geological and economic sciences (Order of Ministry of Education and Science of Ukraine No. 612 dated May, 7, 2019) and technical sciences (Order of Ministry of Education and Science of Ukraine No. 975 dated July 11, 2019)*

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*„Науковий вісник НГУ“ включений до категорії А „Переліку наукових фахових видань України“ з геологічних та економічних наук (Наказ МОН України від 07.05.2019 р. № 612) і з технічних наук (Наказ МОН України від 11.07. 2019 р. № 975)*



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## REGIONAL FEATURES OF UKRAINIAN HIGHER EDUCATION IN WARTIME CONDITIONS

**Purpose.** To describe the regional organizational features of educational services proposed by higher educational institutions (HEIs) of Ukraine in wartime.

**Methodology.** Normative documents regulating the educational process in Ukraine in wartime conditions were analyzed. Observations, interviews, online surveys, and questionnaires followed by mathematical and statistical analysis constituted the empirical basis of the research. The selection of respondents was carried out in HEIs which are not located in the zones of active hostilities or in the immediate vicinity of them.

**Findings.** Since the beginning of the full-scale war in Ukraine, students of higher education have had problems of an infrastructural, institutional, and personal nature. Mixed training has become the optimal form of training for HEIs which are not located in the zones of active hostilities or in the immediate vicinity of them. To ensure continuous learning, higher education institutions should offer students flexible options for education; establish communication between students and experienced and qualified teachers; guarantee access to relevant educational materials; create online learning platforms; provide students with mental health support; cooperate with other universities and educational establishments; and make any necessary adjustments to programs and services. For mixed learning formats, it is best to apply the following educational technologies: online learning platforms; virtual classrooms for lectures and group discussions; video conferencing tools; digital libraries; mobile learning software; and messengers.

**Originality.** Access to high-quality educational opportunities in higher education institutions in the conditions of war in Ukraine requires the introduction of flexible forms of education. Mixed training will be effective in certain regions of the country under acceptable safety conditions.

**Practical value.** Assessment of access for higher education learners to educational resources and technologies in the conditions of war in Ukraine has been performed. The effectiveness of distance education has been studied. Strategies have been developed to solve the problem of ensuring the continuity of education in active combat zones or in the immediate vicinity of them.

**Keywords:** *military state, higher education, mixed education*

**Introduction.** Education is a special sphere of society's life, which has a long-term impact on social, economic, and political development. Under the conditions of the war, which is becoming protracted, the preservation of educational potential plays an important role in the post-war future of the country.

With the beginning of the large-scale Russian invasion of Ukraine, all participants in the educational process face several problems. Thus, in March 2022, in almost all regions of Ukraine, higher education institutions were on forced vacations or were working remotely [1]. As a result of hostilities, 157 institutions of professional pre-higher and higher education were damaged, 21 were completely destroyed [2], 31 institutions of higher education, and 65 separate structural units of higher education were temporarily relocated [3]. The continuation of distance education practice, which developed in the conditions of the pandemic, was forced and expedient in the initial period of the war [4].

The new "military" 2022/2023 academic year began for higher education institutions of Ukraine under the influence of security factors – 37 % of students studied remotely (online), full-time (offline) – 9 %, 54 % of higher education institutions preferred a mixed form of education [2].

It is worth noting that in the conditions of martial law, each region has its specific features that must be considered in the educational process [5], including:

- proximity to the theater of hostilities;
- the intensity of shelling and bombing with long-range weapons;

- destruction or damage to the premises of HEIs, their relocation to safer regions;

- use of classrooms, campuses of "rear" higher education institutions by evacuated institutions and internally displaced persons, etc.;

- the provision of shelters for the participants of the educational process, which ultimately determines the way of studying at the higher education institution.

HEIs which are not located in the areas of active hostilities or near them (Vinnytsia, Volyn, Ivano-Frankivsk, Zakarpattia, Lviv, Rivne, Ternopil, Khmelnytskyi, Chernivtsi oblasts) perform a special mission. They receive and provide available opportunities to ensure housing and premises of evacuated students of higher education and scientific-pedagogical and pedagogical workers, reception of administrations of other higher education institutions to restore the educational process [6].

Depending on the security situation in the regions, there are different forms of the educational process arrangement. In particular, the capital higher education institutions, most of which chose a mixed form of education (75 %), used the following combination: classes in the disciplines of professional training (professional) cycle are held in classrooms, and the disciplines of the general (theoretical) training cycle are held in an online format using synchronous and asynchronous modes [7].

In general, higher education institutions working in a mixed format prefer two forms: a combined calendar approach to education, in which for all applicants the formats (offline and online) change alternately with a certain frequency (several weeks or months) or by years of study – offline education –formats for junior courses, online for seniors.

The use of free digital resources, online educational platforms (Coursera, Udemy, and edX (from March 2022)), and the possibility of free access to licensed training organization tools from Google and Zoom (from August 2022) became a lever for active implementation in higher education institutions' distance learning (37 %) and blended learning (25.1 %). However, according to every fourth (25.1 %) of the interviewed higher education applicants, the level of security of the organization of the educational process in the offline format is low. The insufficient level of protection during full-time studies was indicated by 17.3 % of students from higher educational institutions [2].

Therefore, ensuring high-quality educational and scientific activity, and competitive higher education, which has specific models of implementation, depending on regional characteristics, is an urgent problem today [3].

**Literature review.** Scientists note the importance of remote technologies for students of Ukrainian universities in wartime conditions. At the same time, the authors' attempt to evaluate distance learning as a large-scale innovation seems quite debatable. In our opinion, the use of exclusively distance learning in the educational process during the war does not contribute to the solution of all educational tasks and depends on the influence of security factors [8].

However, it should be noted that the innovative distance learning technologies which were tested during the pandemic can be used by Ukrainian universities. In particular, the combination of interactive online review and the flipped classroom method made it possible to improve students' academic performance, and tendency to critical and reflective thinking [9].

Academics are increasingly paying attention to dynamic learning tools. However, the use of dynamic visualization to convey the content of education (virtual whiteboard) during online learning can be complicated due to insufficient signal speed in the network. Therefore, researchers propose the method of segmentation of educational material as one of the ways to solve the problem [10].

In general, distance learning can be successful when it is aimed at maintaining interaction between students and an experienced teacher using video conferencing tools such as Zoom, Google Meet, etc. In this situation, the delivery of content to the consumer is facilitated by integration with the learning management system [11].

The forced transition to distance education revealed several consequences for teaching and learning of natural sciences and mathematics. Traditional synchronous forms of education, which are used during offline classes, are successfully complemented by asynchronous ones, provided that appropriate methodical and infrastructural support is provided [12].

The researchers' attention is also drawn to the peculiarities of using modern mobile devices to support contextual learning. They conclude that the success of mobile learning depends on the preparation of students, predictable and stable technology, as well as compatibility of educational content [13].

The flipped class method is quite effective during distance and blended learning. In this case, the structure of the lesson, the logic of the course, and the communication infrastructure are critical to success [14]. However, the success of using computer technologies in mathematics education is somewhat overestimated [15].

An important factor that must be considered is the deliberate destruction of the energy infrastructure of Ukraine by Russian troops in the winter of 2022–2023. This led to difficult access to electricity supply and the Internet for students. Residents of rural regions of Ukraine were even more limited in their access to online education. In this case, the experience of some countries in Africa and Asia, which experienced a situation with similar consequences during the coronavirus pandemic, becomes relevant. Researchers believe that, under these conditions, blended learning technologies, which reduced the risks of socio-economic inequality, showed themselves best [16, 17].

The opinion regarding the direction of the transformation of higher education deserves attention. The authors believe that changes in the organization of the educational process are inevitable and will take place based on a mixed learning model. At the same time, the experience of the university as a social institution will be preserved and modern means of mass communication will be used [18, 19].

**Unsolved aspects of the problem.** While the war in Ukraine continues, we set the task to value higher education applicants' access to educational resources and technologies, to study the distance forms effectiveness of education, to develop strategies for solving the ensuring continuity problem of training higher education applicants in regions, where higher education institutions are not in zones of active hostilities or near them.

**Purpose.** The goal of this study is to describe the regional organizational features of educational services proposed by higher educational institutions (HEIs) in Ukraine during wartime.

**Methods.** The basis of the research is the mathematical and statistical analysis of qualitative and quantitative data obtained through observations, interviews, online surveys, and questionnaires.

**Results.** An important feature of this study is the consideration of regional features, where HEIs are not located in the areas of active hostilities or near them. The survey was conducted after intensive shelling of the Ukrainian energy infrastructure in December 2022–January 2023, which may have affected the results. Students of 5 higher education institutions in the city of Vinnytsia were covered by the study in approximately equal numbers. We organized the collection of statistical data, following a systematic approach. The main stages are presented in Fig. 1.

In the first stage, our goal was to find out the main changes in the access to the educational process for higher education seekers since the beginning of the full-scale war in Ukraine. For this purpose, Questionnaire Google Form No. 1 was created, which was answered by 318 applicants (56.9 % from urban areas and 43.1 % from rural areas).

According to the results of the study, it was found that since Vinnytsia was a relatively safe region during the war, there were no significant changes in the educational trajectories of the applicants. As a result, only 17.3 % of applicants had to change their place of residence due to the war. Only 38 % of the respondents indicated that they had to take breaks from studying, while 62 % did not take them at all.

The vast majority – 96.5 % of respondents indicated that they had access to relevant educational resources. Only a small part of students had limited access to such resources as textbooks, methodical materials and online platforms. About 75 % managed to attend classes regularly.

83.8 % of respondents were satisfied with the support and resources of HEI during the war, 96.2 % had access to online learning, 86.7 % regularly communicated with their teachers and classmates, and 37.5 % managed to combine studies and work.

At the same time, about 13 % of applicants stated that due to the lack of communication with teachers, it became difficult for students to receive support and recommendations during their studies.

However, given the constant threat to the safety of participants in the educational process, and frequent air alarms, 75 % of respondents noted that increased stress and anxiety affected their ability to concentrate and participate in the educational process, 58.7 % had to change their educational goals (Fig. 2).

In the process of conversations, interviews, and observations, it became clear that the main challenge was problems with the electricity supply and, due to this, failures in the Internet, and difficulties with obtaining or supporting technologies. Almost half of the respondents noted a decrease in participation and involvement associated with increased stress and anxiety, as well as decreased motivation (Fig. 3).

In addition, about a quarter of the respondents noted an inadequate learning environment, for example, inappropriate

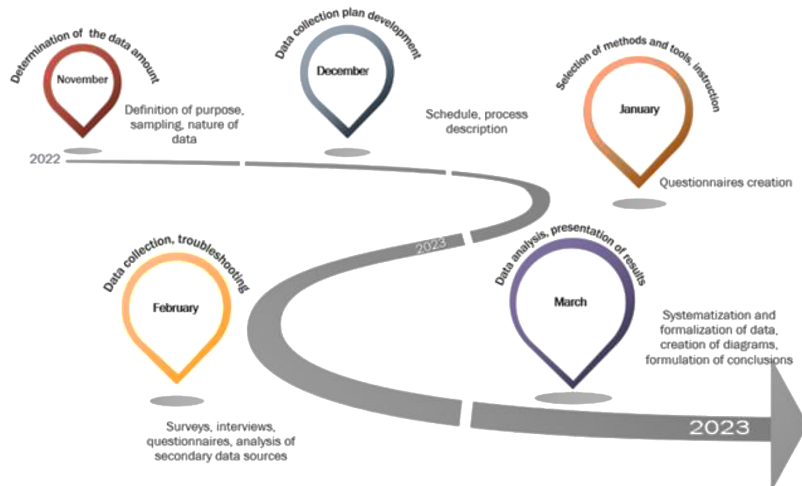


Fig. 1. The main research stages

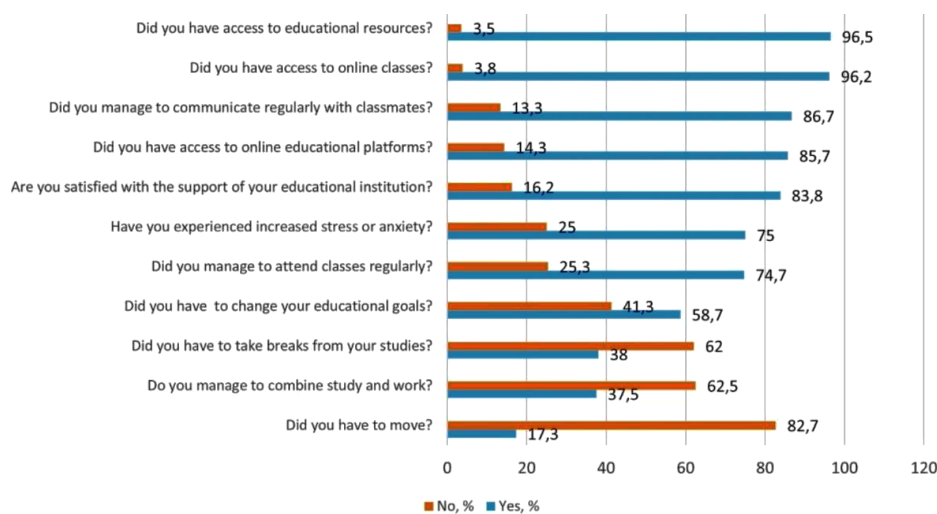


Fig. 2. Answers of higher education applicants regarding the main problems and challenges they encountered while receiving educational services

learning conditions due to damaged infrastructure of universities, lack of a personal place to study (privacy, silence, or comfortable study spaces), reduced participation and involvement (increased stress and anxiety, reduced motivation), reduced education funding (reduced resources available for learning and support).

War and lack of access to educational resources did not affect 42.6 % of respondents, while almost half of respondents were negatively affected.

Therefore, we found out that the problems are mainly infrastructural (infrastructure damage, communication, and transport failures, power outages, economic instability), a little less – institutional (failures in the educational process, reduced access to resources and teachers, inappropriate learning conditions, decrease in education funding, lack of resources available for training and support) and personal nature (relocation or evacuation, decrease in student engagement caused by increased stress and anxiety, decrease in their motivation to participate in the educational process).

Respondents gave the following advice for improving access to educational resources and technology for university students in war-affected areas: “Transition to blended learning”, “Ensure offline modes on educational institutional platforms”, “Maintain asynchronous learning with constant support from teachers”, “Provide access to information resources of other educational institutions”, “Create “break-even points” for learning”, “Implement blended learning, especially in the last weeks of studies, to stay at home and do tasks and not be ner-

vous about anxiety”, “Ensure a stable electricity supply, access to the Internet, equipment, as well as the timely provision of educational resources and materials”, “Take into account not only the availability of resources and technologies but first of all the moral exhaustion of higher education seekers”.

Overall, 67.4 % of students believe that the existing education system in their region can cope with the challenges associated with war.

Taking into account previous studies, the next goal was to find out organizational, professional challenges and needs, the level of technical support of applicants during distance education in the conditions of war in Ukraine. 394 students of higher education institutions in the city of Vinnytsia took part in this survey.

In the existing conditions, the respondents’ opinions were divided as follows: 46.3 % noted the remote form as optimal in the existing conditions, 32.8 % – mixed, and only 20.9 % – face-to-face.

In general, the vast majority find it convenient to use technologies for distance learning (very convenient – 47.1 %, mostly convenient – 43.2 %).

As for the effectiveness of distance education, opinions are divided roughly in half. From much more effective (11.5 %) to less effective (11.2 %).

During distance learning, about 90 % of respondents experienced almost no technical difficulties, consider resources and support which are necessary for success in learning to be good (excellent rated by 36.3 %, mostly good by 36.3 %), and are

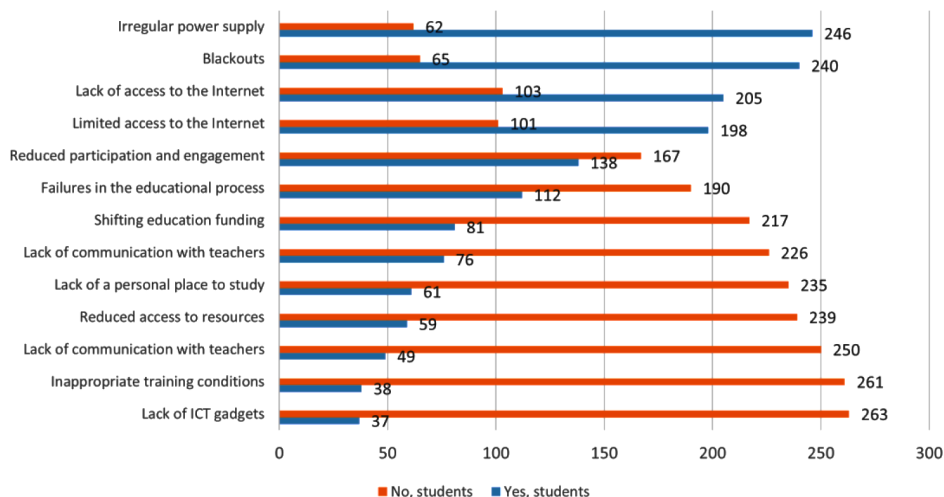


Fig. 3. Answers of students of higher education regarding the main factors that affected the quality of their education

confident in their ability to perform tasks and assessment. In general, they rated the overall quality of their distance education experience as excellent (35.3 %) or mostly good (52.8 %).

About 80 % of students note the presence of such indicators during online classes as responsible attitude, regularity, lesson content understanding, sufficient amount of questions and answers, sufficient quality of assessment, sufficient quality of educational materials remote exchange, and sufficient efficiency (Fig. 4).

In general, the respondents dispelled several myths about the groundlessness of distance education. In particular, only 165 respondents agree with the opinion that distance

learning is worse than face-to-face, as opposed to 203 who do not agree with it.

In addition, distance education mostly meets students' needs for interaction and cooperation in the educational environment (32.3 % rated it as excellent, mostly meets – 45.4 %). At the same time, half of the respondents have problems with feeling isolated and detached from the team. Only 51.8 % of applicants do not have this feeling.

It is worth noting that about 80 % of respondents noted such an advantage of distance learning as flexibility.

To assess the demand for educational resources, we asked students to rate the importance of the most mentioned ones on a 10-point scale (the higher the importance is, the higher the score will be). What was unexpected for us is that students pre-

ferred different messengers among educational technologies. Thus, for messengers (Telegram, Viber, Facebook), the average score (M) turned out to be 7.6 with a mean square deviation ( $\sigma$ ) of 3.1. Google Meet stands out next in the ranking ( $M = 5.8$ ,  $\sigma = 3.78$ ). It is also worth noting the steady popularity of YouTube ( $M = 5.71$ ,  $\sigma = 3.32$ ). Comparatively lower importance was given to such popular platforms as Zoom ( $M = 4.53$ ,  $\sigma = 3.7$ ), Moodle ( $M = 4.1$ ,  $\sigma = 3.58$ ), Microsoft Teams ( $M = 3.8$ ,  $\sigma = 3.59$ ), Google-class ( $M = 3.7$ ,  $\sigma = 3.43$ ). In comparison, corporate educational platforms have the same significance ( $M = 4.4$ ,  $\sigma = 3.55$ ). The least popular was Skype ( $M = 1.97$ ,  $\sigma = 2.12$ ).

A significant proportion of students noted that, first of all, they need a laptop or computer, a smartphone, and headphones for distance learning. In the vast majority, they are provided with them. Only 24 of 376 students stated that they do not have a laptop or computer, 38 persons do not have headphones and 13 of them do not have a smartphone. The presence of a tablet and a graphic tablet did not significantly affect the quality of distance education.

At the same time, it is worth noting that about 20 % of students still note certain difficulties during distance learning, noting that it is difficult for them to ask the teacher questions, study at home, and concentrate on classes. About half are uncomfortable when the teacher asks to turn on the webcam. Greater loneliness, isolation, and lack of informal communication are also noted. Therefore, in the future, we decided to

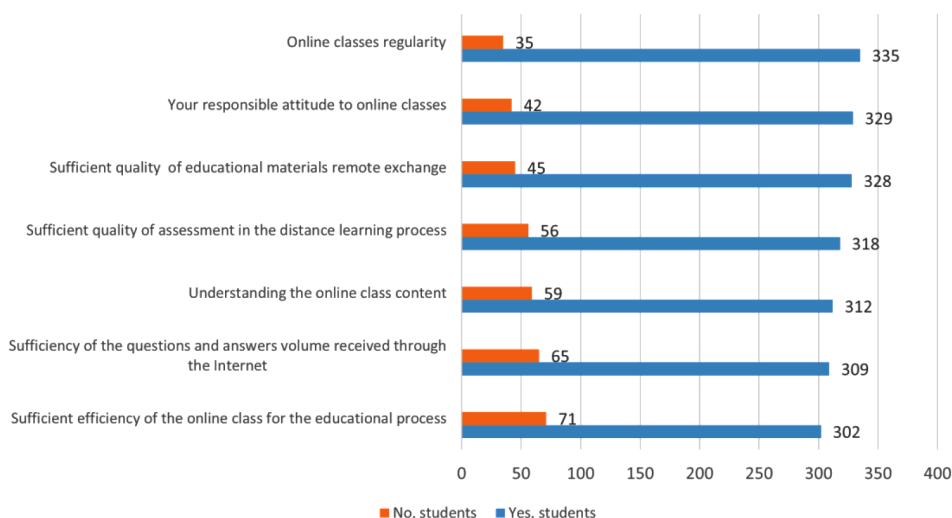


Fig. 4. Applicants' answers regarding the availability of indicators that were monitored during online classes



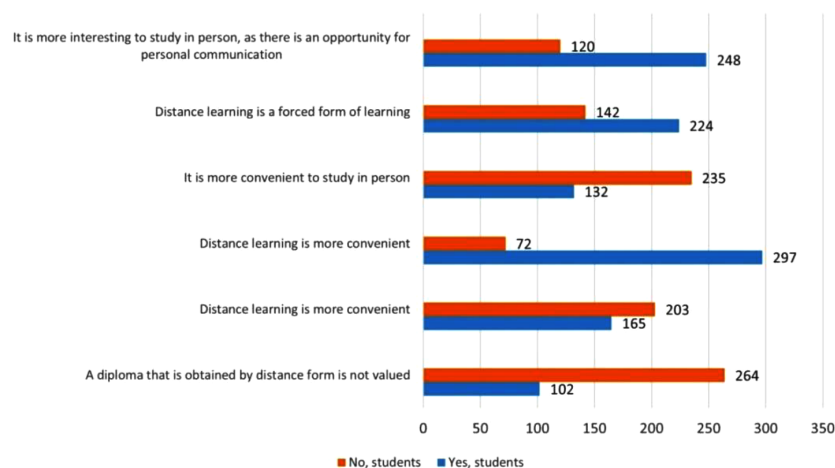


Fig. 5. Answers of applicants regarding their attitude to distance forms of higher education

find out the attitude of respondents to mixed forms, as an alternative to remote ones.

A little more than half of the students treat this form as excellent or mostly good, mostly not good – 17.3 %, and only 19.9 % – bad.

Respondents noted flexibility (65.8 %), convenient feedback (43.8), equally – greater educational opportunities (35.3 %), convenient control (36.1 %), and an individual approach (33.1 %).

According to the respondents, to organize wartime training successfully with a guarantee of a high-quality education, it is necessary to develop online platforms for training, to provide access to experienced and qualified teachers, as well as to relevant and up-to-date training materials. Students also indicated the importance of providing access to university technologies and resources, implementing flexible schedule options (for example, alternation of face-to-face and distance learning, evening and weekend classes), mental health support, counseling on emotional and psychological problems, cooperation with other institutions to share resources and best practices, monitor and assess the situation to make adjustments to their educational services.

Below are typical suggestions for improving distance education: “I believe that students whose training requires presence in laboratories should have a mixed form of education. Everyone else needs to be involved in the remote form for the period of the war and in the winter time”, “Here everything depends on the teacher. If the teacher presents the material in an interesting way, then his classes will be productive both face-to-face and remotely”, “Distance education is great, as it is possible to combine education and work”, “Allow students to choose platforms for conducting the educational process independently during distance learning”, “Stop using Zoom, which requires additional registration, an additional application, and may store data in the PRC; Moodle, which does not provide the necessary flexibility and privacy, compared to Google Classroom and other analogs. Contribute to the provision of educational institutions with “corporate spaces” and conduct communication with international service companies (Notion, TickTick, Coursera, Udemy, JetBrains, etc.), so that educational opportunities for students from EU/NATO countries are also available to Ukrainian students”, “Prepare more detailed and simple programs that will help students better understand the material they are studying and provide opportunities for individual support from teachers”.

**Conclusions.** Therefore, mixed training is the use of optimal form in military training centers that are not located in active combat zones or in the close proximity to them.

In order to ensure the continuity of education, the following steps should be taken by the applicants of higher educational institutions:

- to offer students flexible options for educational trajectories to make maximum use of the available infrastructural resources of higher education institutions (generators, access to the Internet, laboratories, other material and technical bases) and to take into account their personal circumstances that developed during the crisis;

- despite the challenges associated with the war, the university must seek optimal forms of providing students with a high-quality education equivalent to what they would receive through traditional training. This requires establishing communication between students and experienced and qualified teachers, as well as access to relevant educational materials;

- explore the possibility of creating an online learning platform that students can access from anywhere and at any time, ensuring that their studies will not be interrupted by an escalation of hostilities;

- if necessary, provide students with the technologies and resources necessary to participate in online learning so that students can continue their studies and achieve their academic goals;

- provide students with mental health support and counseling;

- cooperate with other universities and educational institutions to share resources and best practices for providing educational services during wartime;

- regularly monitor and evaluate the situation and make any necessary adjustments to their educational programs and services to ensure that students continue to receive a high-quality education in rapidly changing circumstances.

We also concluded that during the war, educational technologies play a decisive role in providing applicants with quality education. Thanks to this, HEIs can provide students with the resources they need to continue their studies and achieve academic goals under various security situations in the region.

For mixed forms of training, it is best to use the following educational technologies:

- online learning platforms that provide students with access to course materials, virtual classrooms, and video conferencing tools;

- virtual classrooms for lectures and group discussions, allowing students to participate in real-time learning;

- video conferencing tools for individual or small group meetings between teachers and students. This allows students to receive personal attention and support from teachers;

- digital libraries that provide students with access to a wide range of scientific journals and books;

- mobile learning programs to provide students with access to educational resources and courses on the go;

- messengers for the prompt delivery of information.

Addressing the issue of higher education in war-torn Ukraine is critical to the country’s future and requires a concerted effort by the government, the international community,

and higher education institutions to ensure that students, faculty, and staff have access to quality educational opportunities.

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## Регіональні особливості вищої освіти України в умовах воєнного часу

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**Мета.** Встановити регіональні особливості організації надання освітніх послуг закладами вищої освіти (ЗВО) України в умовах воєнного часу.

**Методика.** Проаналізовані нормативні документи, що регламентують освітній процес в Україні в умовах військового часу. Емпіричну базу дослідження становили спостереження, інтерв'ю, онлайн-опитування та анкетування з подальшим математико-статистичним аналізом. Вибірка респондентів проводилася у ЗВО, що не перебувають у зонах проведення активних бойових дій або в безпосередній близькості від них.

**Результати.** Із початком повномасштабної війни в Україні у здобувачів вищої освіти виникли проблеми, що мають інфраструктурний, інституційний та особистісний характер. Оптимальною формою підготовки у ЗВО, що не перебувають у зонах проведення активних бойових дій або в безпосередній близькості від них, є змішане навчання. Щоб забезпечити неперервність навчання, ЗВО мають запропонувати студентам гнучкі варіанти освітніх траєкторій; налагодити комунікацію студентів із досвідченими та кваліфікованими викладачами; гарантувати доступ до актуальних навчальних матеріалів; створити платформи онлайн-навчання; надавати студентам підтримку психічного здоров'я; співпрацювати з іншими університетами й навчальними закладами; вносити будь-які необхідні корективи до своїх освітніх програм і послуг. За змішаних форм підготовки найкраще використовувати такі освітні технології: онлайн-навчальні платформи; віртуальні класи для проведення лекцій і групових обговорень; інструменти відеоконференцій; цифрові бібліотеки; мобільні навчальні програми; месенджери.

**Наукова новизна.** Доступ до якісних освітніх можливостей у ЗВО в умовах війни в Україні передбачає впровадження гнучких форм навчання. В окремих регіонах країни, за допустимих безпекових умов, буде ефективним змішане навчання.

**Практична значимість.** Здійснена оцінка доступу здобувачів вищої освіти до освітніх ресурсів і технологій в умовах війни в Україні. Досліджена ефективність дистанційної освіти. Розроблені стратегії вирішення проблеми забезпечення неперервності навчання здобувачів вищої освіти в регіонах, де ЗВО не перебувають у зонах проведення активних бойових дій або в безпосередній близькості від них.

**Ключові слова:** воєнний стан, вища освіта, змішане навчання

*The manuscript was submitted 31.07.23.*