Enhancing Ukrainian High School Teachers' Professional Development through Innovative Leadership and Cooperation with European Universities in Wartime

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ABSTRACT

The article examines the critical challenges and strategic directions for transforming Ukrainian teacher education in the post-pandemic and wartime context. Following the global COVID-19 crisis and amid the ongoing war with Russia, Ukrainian Higher Education Institutions (HEIs) face disruptions in financing, the need for adaptation to online and hybrid learning, and the psychosocial well-being of educational participants. Despite these hardships, the current situation also offers opportunities for systemic reform and internationalization. The study emphasizes that innovative approaches to teacher training, active international cooperation with European universities, and the preservation of scientific potential are pivotal for the sustainable development of Ukrainian teacher education. The research focuses on identifying effective mechanisms for enhancing teacher education through strengthened partnerships with European HEIs. Methodologically, the study applies a combination of theoretical analysis, empirical surveys, structured interviews, and document analysis, underpinned by systemic, activity-based, and constructive approaches. Key findings highlight the importance of integrating European best practices, expanding academic mobility programs, promoting joint pedagogical research, and advancing digitalization processes in education. Particular attention is paid to the alignment of Ukrainian teacher education with European standards, such as the Bologna Process and competence-based approaches, which enhance the competitiveness of Ukrainian graduates in the European labor market. The conclusions underscore that international cooperation is vital for ensuring the resilience, quality, and modernization of Ukrainian teacher education under crisis conditions. The article also outlines perspectives for further research, including the long-term effects of digitalization, comparative analysis of pedagogical practices, and the mobility and employability of Ukrainian graduates. Overall, the study contributes significantly to the discourse on internationalization, crisis-responsive educational reforms, and sustainable innovations in pedagogical training.

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With the post-pandemic period following the global COVID-19 crisis, Higher Education Institutions (HEIs) have faced significant challenges related to restoring their normal functioning. This issue has become even more pressing in Ukraine, where the higher education system must simultaneously adapt to the realities of wartime. Many processes that occurred in connection with military operations throughout the territory of Ukraine are similar to those that occurred with the beginning of the annexation of the Crimean peninsula and part of the eastern regions – the temporary relocation of universities to safer territories, the transfer of universities to the structure of other educational institutions, the mobility of students and teachers from universities in the occupied territories of the country to universities operating under the Ukrainian Ministry of Education and Science of Ukraine, and not quasi-formed "republics". All this determines the features of the structural and conceptual transformations of university education in Ukraine as a whole, therefore the task arises of analyzing all these processes from the point of view of stabilizing and destructive factors that are overcome in conditions of unpredictability and the need to flexibly respond to such processes, both at the administrative and managerial levels, both in the context of organizing the educational process and environment, and in the context of forming the readiness of all participants in the educational process in Ukrainian universities.

Literature Review

The main challenges include: material: physical damage to the premises of the HEI caused by the full-scale invasion of the Russian Federation into the territory of Ukraine, and all

infrastructure losses – computer, software, access to the Internet, databases, technical developments, developments, etc. (Litvin & Kopytko, 2017); *psychological wellbeing of educational process participant*: lack of direct contact with colleagues both within the university and in the context of the country and international interaction during the pandemic, inability to restore this contact due to the war (Pomytkina et al., 2022; Zakharova, 2020); *human resources*: reduction of human capital provoked by the destruction of the HEI infrastructure and location in temporarily occupied territories, loss of student potential due to the destruction of universities and loss of the possibility of organizational support from universities; loss of scientists due to their movement within the country and travel abroad due to the war; low level of foreign language training of the Ukrainian educational community; insufficient competitiveness in the international dimension; low motivation to establish international cooperation of the university community (universities teachers and students) due to stress associated with the war; o*rganizational and pedagogical*: inconsistency of Ukrainian educational programs in individual universities with foreign educational strategies of professional training in the higher education system, as a result of which it is impossible for students to flexibly build an educational route in foreign institutions; insufficient compliance of students' and universities teachers competencies with the requirements of the modern Ukrainian and foreign labor markets, loss of established or absence of partnership relations with foreign institutions, inability to attract new partners and develop new international projects (Andriichenko et al., 2021; Filipovych, 2023; Zaskaleta & Oleksyuk, 2021); a*daptation to Online and Hybrid Education:* The necessity of online learning emerged during the pandemic, and in wartime, ensuring a balanced approach to blended and hybrid formats of teaching and learning remains critical. This approach integrates the benefits of traditional and online learning to maintain accessibility and quality education (Penrod, 2023; Sato et al., 2024)*; financial*: foreign financial support is limited and extends to previously known partners, peripheral HEIs are ignored due to a lack of experience in international cooperation, etc. Russia's military aggression against Ukraine, combined with the economic disruptions caused by the pandemic, has resulted in substantial financial losses. The economic instability of the post-pandemic and wartime conditions threatens the financial sustainability of HEIs, which may, in turn, affect the quality of education and research activities (Lupenko & Radionov, 2024; Totska & Tytarenko, 2023).

Despite these challenges, overcoming them and gaining experience in operating under unpredictable social and economic conditions creates a platform for optimizing and enhancing the educational system in Ukraine and positive influence on these processes, which include:

Adaptability and flexibility of the higher education system, efficiency in making management decisions, and effective institutional and legal regulation of the higher education system under martial law. Higher education institutions, in turn, have demonstrated adaptability by introducing flexible schedules of the educational process and control measures, alternative teaching methods, and developed plans for activities in conditions of uncertainty in order to minimize and overcome disruptions. *Providing technological infrastructure*, adjusting approaches to organizing the educational process, *introducing innovative teaching methods, and deepen the digitalization of education*. Universities have provided teachers and students with digital platforms, technologies and tools for implementing the educational process in online learning. Among the digital tools, we note those that, according to the educational

community, are the most effective in the distance professional training of future specialists. Microsoft Teams, Google Meet, Zoom, Webex Meetings provide a platform for conducting sessions in real time using audio, video, and a shared screen. Miro is an online platform (virtual whiteboard) used for brainstorming, building associative diagrams and maps (mind mapping), designing, demonstrating concepts, etc. Moodle is an educational platform that allows you to create effective sites for online learning. Various online resources for creating presentations, infographics, interactive posters are actively used as well as communication tools, creating tests, tasks, information resources. The need for clarity when studying material has led to the popularity of immersive technologies, the essence of which is to reproduce the necessary material in virtual, augmented, and mixed realities to simulate a real situation. Distance platforms also play an important role in mastering informal education. During a large-scale invasion, a list of distance platforms for learning, self-development, and obtaining help and verified information was published on the website of the Ministry of Education and Science of Ukraine. Among them, we note the online education platform Prometheus, where students have the opportunity to familiarize themselves with video lectures and interactive tasks, ask questions to the teacher on the forum, and in case of successful completion of the training, receive an electronic certificate confirming the knowledge gained. The online education studio EdEra (Education Era) aims to provide high-quality and accessible education in Ukraine. During lectures, notes are provided, accompanied by illustrations and explanations. The process of mastering the educational material is completed by taking an exam; upon successful completion, the student receives a certificate. Other popular distance learning platforms include the distance learning platform for civic education VUM online (Open University of Maidan), the platform for personal and social development for youth based on values, the Ukrainian Leadership Academy, the online learning platform Coursera, online courses from Google, Meta, IBM, Microsoft, Amazon Web Services, as well as such leading universities in the world as California Institute of the Arts, Yale University, Duke University, Erasmus University Rotterdam, etc. The Stanford Open Edx platform provides the opportunity to participate in free online courses taught by Stanford faculty.

Higher education in Ukraine, particularly in teacher education, plays a pivotal role in the recovery and development of society in the post-pandemic and post-war era. Addressing current challenges requires the implementation of systematic changes that ensure accessibility, innovation, psychosocial support, and international cooperation. This study is relevant and significant as it highlights the theoretical and methodological foundations and practical strategies for overcoming the existing challenges through enhanced collaboration with European universities.

Renewal of Ukrainian science, the innovation sphere and technology transfer, deepening the integration of Ukrainian higher education into the European educational and research space. In the period after the pandemic and martial law, thanks to the active work of the Ministry of Education and Science of Ukraine, the efforts of the Ukrainian educational and scientific community, and the unprecedented support of Ukraine from the international scientific community, Ukrainian science, the innovation sphere and technology transfer received a powerful impetus in their development.

All the mentioned above indicates *the actuality of the research* devoted to the problem of how higher teacher education in Ukraine can be transformed, not only passing through

challengers inside of the country, but also by international cooperation, which European scientific community provide for Ukrainian scientists in the conditions of russian aggression and war against Ukraine. In the aftermath of the global COVID-19 pandemic and amidst the ongoing war in Ukraine, the higher education system, particularly teacher education, faces unprecedented challenges. Disruptions in institutional functioning, limited access to educational resources, psychological distress among academic communities, and the urgent need for systemic adaptation have highlighted critical areas requiring reform. In this context, enhancing the quality and resilience of teacher education through innovative, sustainable, and cooperative mechanisms becomes vital. The development of strategic partnerships with European universities opens new avenues for academic support, resource sharing, dual programs, and joint research initiatives that can foster modernization and stability in teacher training. Addressing the transformation of teacher education within such turbulent sociopolitical conditions makes this study both urgent and highly relevant.

*The research on the topic "*Enhancing Ukrainian High School Teachers' Professional Development through Innovative Leadership and Cooperation with European Universities in Wartime*" will significantly contribute* to the scientific discourse on internationalization, crisis-responsive education reform, and innovation in pedagogical training. It provides a theoretical and methodological framework for integrating European best practices into Ukrainian teacher education programs through sustainable cooperation models. *The study also explores mechanisms for preserving and strengthening academic and scientific potential* during wartime, offering a blueprint for resilient, inclusive, and future-oriented teacher education. By systematically analyzing and adapting cross-border educational models, this study enriches the comparative pedagogical field and provides empirically grounded recommendations for policymakers, educators, and university leaders.

The purpose of the study is to substantiate and propose effective mechanisms for improving and enriching teacher education in Ukrainian universities through enhanced cooperation with European higher education institutions under the conditions of post-pandemic recovery and wartime challenges. Therefore, *the object of the study* is the system of teacher education in Ukrainian universities in the context of sociopolitical and educational transformation. *The subject of research* is the mechanisms of international cooperation with European universities aimed at improving and enriching high school teachers' education in Ukraine under post-pandemic and wartime conditions.

For the purpose of achievement, the three-based tasks are defined in this issue:

−   to analyze the current state and key challenges of high school teachers' education in Ukraine under wartime and post-pandemic conditions;

−   to identify and adapt effective models of international cooperation and best European practices in teacher training;

−   to develop practical recommendations for improving high school teachers' education through innovative institutional mechanisms and international partnerships.

Method

The research methodology involved the gradual application of a set of interrelated methods, such as: *theoretical* – analysis, systematization, and generalization of scholarly sources in the fields of comparative pedagogy, international education, and teacher training to determine the

theoretical and methodological foundations of improving teacher education through international cooperation; *empirical* – electronic surveys, structured interviews, and analysis of official documents and cooperation agreements between Ukrainian and European universities aimed at joint teacher education initiatives during wartime and post-pandemic recovery.

The research methodology was based on systemic, activity-based, and constructive approaches to analyzing the development of higher education systems in Ukraine and globally. The methodological tools employed to achieve the study's objectives included: the analysis of statistical data from Ukrainian and selected European statistical and research centers; examination of European frameworks supporting Ukrainian academic colleagues, particularly the provisions on "temporary protection and asylum", as well as statements and policies of European and international organizations on "scholars at risk", and institutional policies of individual universities aimed at supporting academic staff and students from Ukraine.

Furthermore, the methodology included the systematization of empirical data through monitoring the destructive factors affecting the development of higher education, which was conducted via interviews and surveys with participants in the educational process across various regions of Ukraine (Kyiv, Cherkasy, Mykolaiv, Odesa, Luhansk, Vinnytsia, Sumy, Ivano-Frankivsk, Dnipropetrovsk, and Kharkiv regions). The selection of these regions was determined by the intention to cover both relatively safe areas and those frequently exposed to dangers due to their proximity to active combat zones. The validity and objectivity of the survey results are determined by the sample: the number of participants surveyed and interviewed from the educational process totaled over 300 individuals from universities across all regions of Ukraine. These included: National Aviation University (Kyiv), Vasyl Stefanyk Precarpathian National University (Ivano-Frankivsk), Sumy State Pedagogical University named after A. S. Makarenko (Sumy), Sumy College of Arts and Culture named after D. S. Bortnyansky (Sumy), Kharkiv Humanitarian Pedagogical Academy of the Kharkiv Regional Council (Kharkiv), Pavlo Tychyna Uman State Pedagogical University (Uman), Cherkasy Medical Academy (Cherkasy), Cherkasy State Technological University (Cherkasy), South Ukrainian National Pedagogical University named after K. D. Ushynsky (Odesa), Pavlo Tychyna Uman State Pedagogical University, Uman Humanitarian-Pedagogical Vocational College named after T. G. Shevchenko of the Cherkasy Regional Council (Uman), Mykolaiv National University named after V. O. Sukhomlynsky, and the Chornomorsk National University named after Petro Mohyla (Mykolaiv) and others.

Limitations of the study. The presented study highlights certain aspects of increasing the professional development of university teachers through mechanisms of international integration in the post-pandemic period and wartime. This was done to represent the general dynamics of changes in organizational, pedagogical, and technical conditions in higher education institutions of Ukraine and to outline the responses of the university community to the new and new challenges that arise for higher education as a whole against the backdrop of martial law in the country. The description and other transformations in higher education institutions in Ukraine for the teaching community can certainly be expanded, clarified, and analyzed in detail, and scientific discussions can be conducted, which also creates a basis for further research into the outlined problem and is a prospect for analyzing the dynamics of changes in the psychological readiness of the university community for further work and study in the post-pandemic and wartime conditions.

The research methodology involved three stages:

–   the first stage – monitoring the current state and key challenges of teacher education in Ukrainian universities during wartime and post-pandemic recovery;

–   the second stage – conducting comparative analysis of models and practices of teacher training and international academic cooperation in selected European and Ukrainian universities (with the development of a comparative matrix of similarities and differences);

–   the third stage – developing evidence-based recommendations for enriching teacher education in Ukraine through innovative cooperation mechanisms with European partners.

Results

Ukrainian higher teachers' education reality. Under the conditions of war and global transformational processes, education plays a decisive role in ensuring societal stability, restoring human capital, and shaping future generations of highly qualified professionals. The training of pedagogical staff is one of the key factors in ensuring the quality of the educational process; therefore, its improvement acquires strategic significance. In analyzing the state of higher teacher education amidst the ongoing Russian aggression, which has persisted for over three years, several *negative impacts* on Ukraine can be identified:

–   The forced displacement of university faculty and students, resulting in staff shortages and disruption of the educational process (Nuzhna et al., 2023a).

–   Insufficient funding for the education sector due to the need to reallocate state resources to military needs (Ministry of Education and Science of Ukraine, 2024).

–   The psychological consequences of war for participants in the educational process, which require additional support measures and the adaptation of educational practices (Melnyk et al., 2023).

It is important to emphasize that an extremely valuable tool for scientific research on identifying destructive factors affecting the functioning of higher education in Ukraine during the post-pandemic period and in wartime conditions for our working group was the surveys conducted among participants in the educational process at various stages of the study, starting from 2019–2020 and continuing until now (spring-autumn 2023). This approach ensures the validity of the data obtained and allows us to track the dynamics of changes and their relevance at the time of the survey. In our research (Melnyk, 2022; Melnyk et al., 2022; Melnyk et al., 2023), the surveys and interviews were structured using a block-based approach: general information, psychological block, and methodological block. The latter two blocks, through direct live communication and online questionnaires, enabled the analysis of destructive factors not only from the perspective of analytical documents but also in terms of the relevance of the information received "here and now".

It is worth noting that the results from the first block indicated that the survey covered all regions of Ukraine; the age of student respondents ranged from 17 to 40 years, with respondents pursuing "Bachelor" and "Master" degrees. The age range of faculty respondents was from 24 to 65 years.

Analyzing the responses presented in the psychological block, we can conclude that both faculty members and students indicated that the most challenging aspect was psychological readiness – preparing for academic or professional activity, physical exhaustion due to lack of sleep, and stress related to interruptions in the educational process due to air raids. Respondents'

answers and the analysis of the methodological block confirmed that the obstacles to the normal functioning of the educational process, in the broadest sense of the term, included: technical issues – some faculty members (13.2%) were unable to teach online and react flexibly to changes; insufficient methodological preparation of faculty and some students to work with information and communication technologies in the context of distance education, and obtaining education in a mixed and hybrid format (Melnyk et al., 2023).

One of the aspects of destructive changes in the process of hastily implementing remote learning was identified by both students (56.9%) (Melnyk et al., 2023) and faculty (39.4%) as a decrease in the quality of education. Specifically, students believe that the quality of education has decreased because they feel tired and stressed, which has led to less profound and systematic knowledge (61.7%), although they consider the quality of educational services to be high (87.7%). Both faculty and students agree that the quality of education also suffers because of the lack of direct contact (over 56% of faculty have their cameras off (Melnyk et al., 2022); 51% of students reported the absence of "live communication"), which hinders effective and coordinated communication, the establishment of interaction between universities both within the country and with the academic and student communities abroad, and the development of flexibility in international partnership interactions due to the inability to freely travel abroad from Ukraine and vice versa.

The constructive factors of higher teachers education development in the post-pandemic and wartime conditions in Ukraine include the following: 1) adaptability and flexibility of the higher education system, the promptness in decision-making, and effective institutional and legal regulation of the higher education system in wartime conditions; 2) improvement of technological infrastructure, optimization of approaches to organizing the educational process, implementation of innovative teaching methods, and deepening the digitalization of education; 3) renewal of Ukrainian science, the innovation sector, and technology transfer, as well as integration of Ukraine's higher education into the European educational and research space; 4) strengthening the resilience of the educational community. And in this investigation, we closely point out the European context as a factor of improvement and which helps to develop higher teachers' education through different ways and mechanisms of cooperation.

European perspective and the state of Ukrainian scientists' integration. From a European perspective, it is crucial to address the provisions of the European University Institute (EUI), which actively mobilizes its networks of university cooperation, including the Open Society University Network (OSUN), Scholars at Risk (SAR), and the Scholars Rescue Fund (SRF), to advocate for and implement coordinated actions to support the Ukrainian higher education sector. These programs and organizations are seeking resources to assist the EUI in providing a safe academic environment for Ukrainian scholars during their exile. The European University Association expressed its solidarity with Ukrainian universities, students, and staff following Russia's invasion of Ukraine on February 24, 2022. Numerous statements of support, initiatives for providing specific assistance to those in need, and other forms of solidarity have been issued. Currently, working groups are being formed for the post-war recovery of the country's university sector. The European Commission has provided greater flexibility for the Erasmus+ program to accommodate Ukrainian students and staff for up to 12 months, along with other targeted programs supporting researchers and students. The Commission has also

adapted its EURAXESS network, which supports researchers globally, to assist Ukrainian scientists arriving in Europe (European University Association, n.d.).

However, despite the comprehensive support from European and global higher education institutions, research centers, and organizations, challenges for the Ukrainian academic community forced to leave Ukraine due to the war have emerged, including bureaucratic procedures in European universities (such as document submission issues, which 4.6% of respondents mentioned, mismatch of qualifications or university profiles with the location of respondents (4.6%), lack of practices for attaching doctoral students from other countries by request or initiative (1.2%), low motivation among Ukrainian students and faculty due to stress and the war (14.7%), in some cases, the inability to provide full funding for the salaries of at-risk researchers, language preparation, etc.), and a lack of flexibility in European educational institutions regarding employment for Ukrainian scientists, who required rapid responses to the situation and financial support.
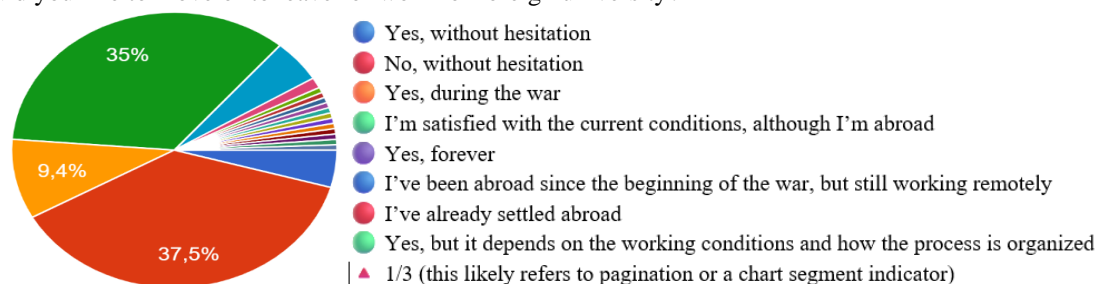
A destructive factor in the context of flexible integration is the low level of adequate foreign language proficiency within the Ukrainian academic community (62.4% of respondents indicated that low foreign language skills hindered their ability to study or work in foreign higher education institutions), especially in the fields of pedagogy, social sciences, and natural sciences. This has contributed to the fact that not all Ukrainian educators were able to find work in their field abroad (it should be noted that the percentage of scholars remaining in foreign educational institutions to carry out research or teaching work significantly decreased in 2023, as many of the faculty members who had left returned to Ukrainian universities).

However, this issue is not only about low foreign language proficiency but also about the ability to establish international partnerships and realize the project potential of higher education. We must partially disagree with the assertion in the analytical document "Universities During War: From Educational Institutions to Social Missions" (2022) regarding the use of international academic mobility or internships for evacuation abroad. The document states that mobility opportunities were not used by those who had no previous experience of partnership cooperation with foreign higher education institutions (School of Political Analysis of NaUKMA & National Agency for Higher Education Quality Assurance, 2022, p. 69). However, responses to our surveys and discussions during academic events (conferences, round tables, etc.) have shown that some individuals, for the first time, tried to engage in international mobility and achieved results. While the percentage of such faculty members is low, there are representatives of the Ukrainian academic community who were able to seize the opportunity and, upon arriving in a country where they had evacuated, found an educational institution for cooperation and employment. Among the student population, we observe the opposite trend – a significant number of students remain in European higher education institutions and do not plan to return to Ukrainian universities during the war, and in some cases, possibly permanently. This brings up the destructive factor of losing student potential.

The statistics of the tendencies of cooperation show that Ukrainian scientists could be integrated into European universities and higher educational institutions, but a big percentage of the scientists would like to leave Ukraine for a lot of time, only 25% of respondents are willing to go for 1–2-week internships at foreign universities. These could be traced in diagrams in Figure 1. And as we observe Figure 2, 45.5% and 30.3% of Ukrainian scientist do not want to leave their universities at all, only 12.1% are willing to do it during a war period.

Figure 1

Ukrainian Scientists Willingness to Go or to Move to Work in Foreign University 1

Would you like to move or to leave for work for foreign university?

- 🔵 Yes, without hesitation
- 🔴 No, without hesitation
- 🟠 Yes, during the war
- 🟢 I'm satisfied with the current conditions, although I'm abroad
- 🟣 Yes, forever
- 🔵 I've been abroad since the beginning of the war, but still working remotely
- 🔴 I've already settled abroad
- 🟢 Yes, but it depends on the working conditions and how the process is organized
- ▲ 1/3 (this likely refers to pagination or a chart segment indicator)

Source: Compiled and calculated based on survey data

The other questionnaire shows that 44,1% do not want to go for an internship at all, and 39,7% are willing to have short-term internships in a foreign university (Figure 2).

Figure 2

Ukrainian Scientists' Willingness to Go or Move to Work at a Foreign University 2

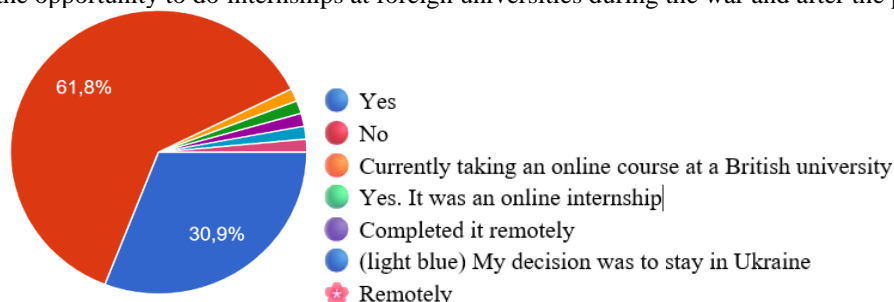Would you like to go on an internship at a foreign university during the war?

- 🔵 Yes, for a short period of 1 week to 3 months
- 🔴 No
- 🟠 Yes, until the end of the war
- 🟢 Yes, but only in an online format
- 🟣 Hard to say
- 🔵 (light blue) After the war
- 🌸 I have small children, so no

Source: Compiled and calculated based on survey data

The other aspect is that a lot of Ukrainian scientists (61,8%) did not have any internship in foreign universities (Figure 3), because, 45.6% do not know English or any other foreign language, 17.6% do not know that there are opportunities for them to apply in different scientific funds and if they know they do not want to bother themselves because of the burocracy and organization for support (Figure 4) and more than 23% of them do not want. Though 30.9% of Ukrainian scientists managed to get a foreign internship despite wartime conditions, quite a high number of scientists (61.8%) have not used the opportunity, and it is only because of the lack of knowledge about the programs and funding in the EU (Figure 3).

Figure 3

The Opportunity to Work in a Foreign University

Did you have the opportunity to do internships at foreign universities during the war and after the pandemic?
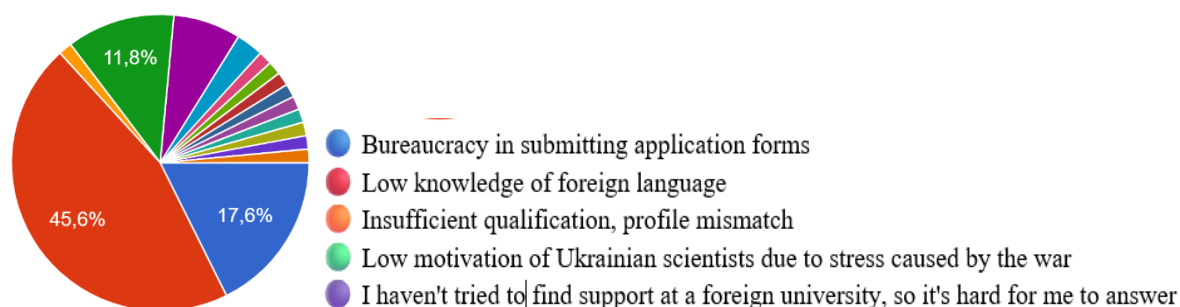

- 🔵 Yes
- 🔴 No
- 🟠 Currently taking an online course at a British university
- 🟢 Yes. It was an online internship
- 🟣 Completed it remotely
- 🔵 (light blue) My decision was to stay in Ukraine
- 🌸 Remotely

Source: Compiled and calculated based on survey data

Figure 4

The Most Difficult Obstacles in Finding Support at a Foreign University, According to Ukrainian Scientists' Opinion

In your opinion, what are the most difficult obstacles in finding support at a foreign university as a Ukrainian scientist?

Source: Compiled and calculated based on survey data

All these also demonstrate that the Ukrainian scientific community is in high need of support, and tracking them in the process of European science and higher education integration.

In this context, we need to emphasize that foreign educational and scientific institutions have introduced numerous programs, funds, and resources to support the Ukrainian educational and scientific community. These programs are widely covered in various informational sources and analytical reports, so we will focus only on the main ones. National agencies across all European countries have created dedicated webpages to provide informational support to Ukrainian students and researchers. Practically every European university has posted information on its resources for Ukrainian students and scholars regarding grant opportunities for mobility or participation in other programs. A general information page, "ERA4Ukraine", with resources to support Ukrainian higher education, has been created on the European Commission's "EURAXESS" website. A special program, "Horizon for Ukraine", has been launched within the framework of the overall European program, "Horizon Europe". The European Centre for Modern Languages (ECML) of the Council of Europe has developed a website to support the linguistic integration of Ukrainians. Significant decisions have been made in the field of academic mobility, including the development of special recommendations for national agencies of "Erasmus+" and "European Solidarity Corps" regarding the prioritization of funding within student mobility grant programs (KA131 Staff/student mobility in HE), international mobility for staff (KA107 Staff/learners mobility in HE – international), youth mobility (KA153 Mobility of Youth workers, KA152 Mobility of young people (Youth exchanges), KA154 Youth participation activities), and volunteering (ESC51 Volunteering activities). Various forms of support have been proposed for students to continue their studies online in Ukraine, as well as for faculty members to continue teaching in Ukrainian institutions, alongside various types of support for adaptation in new countries. As a result, many representatives of Ukrainian higher education have been able to participate in international projects, establish cooperation with professional communities, and gain experience in internships and teaching at foreign educational institutions. For example, the European Commission offered an additional competition for representatives of Ukraine within the "Jean

Monnet Action" project. Through budget reallocation, 38 Ukrainian projects were funded instead of projects from the Russian Federation, and 93 projects were recommended for signing. A comparable number of projects (121) were implemented from 2014 to 2020. In general, Ukrainian students, researchers, and academic staff were provided with assistance and support at two levels: at the pan-European level, where they were granted equal rights with EU citizens, including access to educational services in their host countries; and at the institutional level, where flexibility was introduced to address the participation of Ukrainians in EU grant programs and increased support was provided.

Of course, there is a risk that not all students, educators, and researchers will return to Ukraine, which may result in a form of "brain drain". At the same time, we agree with the opinion of the authors of the analytical report "War in Ukraine: Reshaping the Higher Education Sector" that Ukrainian students and faculty abroad are a kind of "bridge" (ambassadors) between their Ukrainian institutions and the host university, which has positive consequences for both sides. Even in the case of not returning to Ukraine and continuing education/work at a foreign institution, such ambassadors will conduct research related to Ukraine, which will undoubtedly contribute to the dissemination of scientific knowledge about our country and serve as a form of promotion for Ukrainian studies and Ukrainian scholars.

Another important aspect of support for Ukrainian researchers and educators is access to advanced scientific resources. Several foreign publishers and companies have provided Ukrainian educational institutions and research organizations with free access to their electronic resources. For example, Ukrainian researchers gained access to over 115,000 books, nearly 40,000 journals, and dozens of databases on the Research4Life portal, including full-text resources from leading academic publishers such as Elsevier, Springer Nature, Wiley, Taylor & Francis, Oxford University Press, Emerald, and many others.

An additional focus of international cooperation has been and remains the active advocacy for initiating sanctions and other types of restrictions by international partners regarding cooperation with representatives of the aggressor country.

The article under discussion highlights the profound challenges and opportunities faced by Ukrainian higher education in the context of war and the broader global transformation process. It provides a comprehensive analysis of the impact of the ongoing Russian aggression, which has significantly disrupted the Ukrainian education system, while also examining the potential of European cooperation in fostering recovery and resilience in higher education.

Discussion

The article outlines several key negative impacts on Ukrainian higher education during the war*: forced displacement of faculty and students.* One of the most pressing issues is the forced relocation of both students and faculty members. This has resulted in faculty shortages, disrupted the continuity of teaching, and impacted the overall stability of educational processes. The displacement has also made it difficult for many institutions to maintain normal operations, especially in regions under direct threat (Nuzhna et al., 2023b). *Insufficient funding:* As a consequence of reallocating state resources to military needs, the education sector has suffered from inadequate funding. This financial strain has hindered the capacity of educational institutions to maintain their infrastructure, invest in digitalization, and support faculty development (Ministry of Education and Science of Ukraine, 2024). *Psychological*

consequences: both students and faculty have faced significant psychological challenges due to the war. The trauma of living in a conflict zone, combined with the stress of frequent disruptions such as air raids, has created an environment where academic activity is hampered by fatigue, anxiety, and uncertainty. The research conducted by Melnyk et al. (2023) employed surveys and interviews to gather data from both faculty and students, offering valuable insights into the realities of teaching and learning under war conditions. The survey covered participants from various regions of Ukraine, with respondents ranging from 17 to 65 years old. Key findings from the surveys include: *psychological readiness and stress:* faculty and students reported that the most challenging aspect of education during wartime was the psychological readiness required to cope with the stresses of academic life amidst the ongoing conflict. Physical exhaustion, stress, and interrupted educational schedules were all major factors affecting the participants' well-being (Melnyk et al., 2023). Another significant challenge identified was the inadequate *technical and methodological preparedness for online and hybrid learning formats.* A portion of faculty (13.2%) struggled to adapt to online teaching, and some students faced difficulties in engaging with distance learning due to a lack of technological access or skills. Furthermore, many respondents indicated that the quality of education had declined due to the lack of in-person communication, which is crucial for effective learning and teaching.

Despite these challenges, the article also identifies several constructive factors contributing to the development of Ukrainian higher education during the war: *the ability of Ukrainian institutions to quickly adapt and adjust to changing* circumstances has been a key strength, decision-making processes within higher education institutions have proven to be resilient, allowing them to continue operations despite the ongoing conflict. The *push towards greater digitalization* has facilitated the continuation of education during wartime. The integration of innovative teaching methods and technological infrastructure has allowed for some level of continuity in teaching, even if the quality has suffered in some areas (Abbatiello et al., 2017). *Renewal and Innovation* in the conditions of war have acted as a catalyst for the renewal of Ukrainian science, particularly in terms of technology transfer and integration into the European research space. Ukrainian institutions have made strides in deepening their connections with European universities and research centers, which is crucial for long-term recovery (Melnyk et al., 2022).

The article underscores the importance of European cooperation in supporting Ukrainian higher education during the war. European institutions have been actively involved in assisting Ukraine's educational and scientific communities through various programs. The European University Institute (EUI) and other networks such as the Open Society University Network (OSUN) and Scholars at Risk (SAR) have provided critical resources to help Ukrainian scholars continue their research and teaching activities in exile. In addition, the European Commission has implemented flexible measures for the Erasmus+ program, allowing Ukrainian students and staff to engage in mobility programs, which has provided much-needed support in a difficult time. However, the article also highlights challenges faced by Ukrainian scholars abroad, such as bureaucratic hurdles, mismatched qualifications, and inadequate language skills, which have hindered full integration into European institutions (European University Association, n.d.).

In the context of the ongoing challenges faced by Ukrainian higher education institutions due to the war and global transformations, international cooperation with European universities plays a crucial role in stabilizing and modernizing teacher training systems. The collaboration

not only fosters educational innovation but also strengthens the capacity of Ukrainian universities to adapt to new global standards and demands.

1. International cooperation as a mechanism for improving the training of pedagogical staff is multifaceted. One of the primary benefits is the integration of best practices in teacher preparation through the introduction of contemporary educational technologies. European collaboration, supported by initiatives such as Erasmus+, DAAD, and Horizon Europe, significantly contributes to improving the qualifications of Ukrainian educators through academic mobility programs. These programs provide teachers with access to cutting-edge knowledge and pedagogical methodologies, ensuring that they are well-equipped to meet the evolving demands of the educational sector.

Moreover, (2) *partnerships with European institutions expand opportunities for joint research* initiatives in the fields of pedagogy and teaching methodologies, which is crucial for the advancement of Ukrainian higher education. This collaborative approach enhances the quality of teacher education and the relevance of curricula, aligning them with contemporary educational trends and challenges.

In particular, (3) *the digitalization of the educational process has gained significant importance*, especially in light of the crisis caused by the war. European universities have played a vital role in supporting Ukraine's educational institutions by introducing modern online courses, distance learning platforms, and interactive teaching methods. The integration of digital tools into the educational system ensures that learning continues even under difficult conditions, fostering continuity and stability in the education process (OECD, 2023).

Furthermore, (4) *the alignment of Ukrainian teacher education programs with European standards enhances* the competitiveness of Ukrainian graduates in the European labor market. Reforming teacher training by the Bologna Process is a key step toward achieving academic and professional mobility for graduates. By ensuring that educational programs meet the demands of the labor market, Ukrainian universities are creating a more flexible and responsive educational system that prepares students for the challenges of a globalized world (European Commission, 2022).

The competence-based approach in higher pedagogical education, which is increasingly emphasized in European practices, is another critical aspect that Ukraine is adopting through its cooperation with European partners. This approach not only enhances the quality of teaching but also better aligns educational outcomes with the needs of the labor market (ENQA, 2023). By incorporating the best European practices, Ukrainian universities can improve the quality of teaching and make significant strides toward modernization.

Thus, international cooperation serves as a vital driver for improving teacher education in Ukraine. It allows the country to overcome the challenges posed by war and crisis and ensures the long-term integration of the Ukrainian educational system into the broader European space. The cross-border exchange of knowledge, experiences, and resources enriches the Ukrainian education sector, enabling it to remain competitive and responsive to the demands of the global educational landscape. Through this cooperation, Ukraine is not only preserving the continuity of education during difficult times but also positioning itself for a stronger, more resilient future in European academia.

Conclusion

The integration of Ukrainian higher education institutions into the European educational space represents a critical strategy for the stabilization and modernization of teacher training systems, especially in the context of the ongoing war and global challenges. This international cooperation facilitates the exchange of knowledge, best practices, and resources, which significantly enhances the quality and relevance of Ukrainian pedagogy. Key mechanisms contributing to the improvement of teacher preparation include the adoption of modern educational technologies, the expansion of academic mobility programs, and the implementation of joint research initiatives in pedagogy and teaching methodologies. These collaborations not only improve the qualifications of educators but also ensure the continuous development of curricula that are aligned with the latest European standards and labor market demands.

One of the most significant outcomes of this cooperation is the digitalization of the educational process, which ensures continuity in learning despite the challenges posed by the war. The introduction of modern online courses, distance learning platforms, and interactive teaching methods has been instrumental in adapting to the crisis while maintaining high standards of education. Additionally, the alignment of Ukrainian teacher education programs with European standards, particularly those outlined in the Bologna Process, enhances the mobility of graduates and contributes to the competitiveness of Ukrainian higher education in the European labor market.

The implementation of a competence-based approach, as promoted by European educational systems, also holds promise for improving the quality of teaching and better aligning educational outcomes with the needs of the labor market. By incorporating these approaches, Ukrainian universities can enhance the flexibility and responsiveness of their education systems, preparing graduates for a globalized and rapidly changing world.

Perspectives for further investigation. The ongoing collaboration between Ukrainian and European universities offers rich opportunities for further research, particularly in areas where gaps in knowledge remain. Future investigations could focus on the long-term impact of digitalization. While the digitalization of education has been an immediate response to crisis conditions, its *long-term impact on teaching quality*, student engagement, and academic outcomes in Ukraine requires further study. Research could explore the effectiveness of various digital tools and teaching methods and their impact on different educational contexts. Comparative Analysis of Pedagogical Practices: comparative research on the pedagogical practices and methodologies employed by Ukrainian and European universities could offer deeper insights into how best to integrate European standards into the Ukrainian educational system. Special attention could be paid to the challenges and successes of implementing these practices in a post-crisis context. *Academic and professional mobility of Ukrainian graduates*: as Ukrainian higher education aligns more closely with European standards, the mobility of students and graduates within the European educational and labor markets will become increasingly important and research could investigate the experiences of Ukrainian graduates in European countries, focusing on their integration into the academic and professional spheres. Competency-based education models in the field of teacher training could provide valuable insights into their effectiveness in meeting the demands of the labor market and *exploring how competency-based models can be adapted to different disciplines* and educational contexts

would be crucial. *The role of international partnerships in post-war recovery*: given the unique context of Ukraine's post-war reconstruction, research could explore the role of international academic partnerships in facilitating the recovery and development of the education sector, which includes international cooperation in rebuilding infrastructure, developing new educational policies, ensuring sustainability in the long term etc.

In conclusion, it is important to emphysise, that the Ukrainian higher education system has largely managed to cope with the challenges after the pandemic and martial law. The management decisions taken (taking into account the available resources and capabilities and time constraints) were aimed at maximally preserving the system from possible significant losses and can be considered optimal for the higher education system. Under martial law, domestic higher education institutions responded promptly to the difficult situation, promptly adapted to new requirements, and developed and implemented adequate measures to transition to distance and blended models of organizing the educational process, using modern digital technologies. Due attention in the higher education system is paid to the use of innovative technologies and the latest learning tools in the educational process, and the development of research infrastructures. This makes it possible to ensure a high level of organization in the educational process, effective interaction between students and teachers, and to maintain the proper level of teaching quality and academic success of students.

In scientific and research activities, the institutional and legal foundations for conducting scientific and innovative activities in Ukraine are being strengthened, trends are noted towards the formation and implementation of new scientific and innovative projects within the framework of the EU research and innovation program "Horizon Europe", the development of human capital, the return of scientists to Ukraine and the further integration of Ukraine into the European Union and the European Research Area. Positive trends are also observed in the direction of supporting national and international academic mobility of students, providing special support to residents of temporarily occupied territories, from zones where active hostilities are underway, unprotected and vulnerable population groups, etc.

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