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**TRANSFORMATION OF HIGHER EDUCATION IN UKRAINE
IN THE CONDITIONS OF MARTIAL LAW**

The article identifies the main problems of the higher education system during period of martial law: damage of the physical and mental health of participants in the educational process, the destruction of educational institutions, the outflow of teachers and students abroad, the inability to continue study in conditions of constant air raids and shelling, a decrease in educator's motivation and productivity. The existing changes in the education system made by the government and the Ministry of Education and Culture were analyzed: an increase in the education costs by an average of 10%, the introduction of the grants system for education if high NMT (national multidisciplinary test) scores are obtained, unification and reduction of the number of existing higher education institutions almost in 2 times. According to the authors, effective directions for transformation of the higher education system are proposed: support for students, reconstruction of affected higher education institutions, creation conditions for transformation the higher education system by moderating higher education institutions network, support of European partners, strengthening of interaction with practice bases for students (dual education), approximation of the content of educational and professional standards to EU standards, building a system of easy and effective access to higher education from all regions of our country and also from abroad, as well as strengthening requirements for the training level of applicants. According to authors, the primary steps should be: the preservation of the scientific and pedagogical composition and potential of higher education institutions, the acceleration of the development of higher education quality in today's difficult conditions and the increase of the quality of higher education through modernization of the institution's network and effective state support.

Keywords: higher education, higher education institutions, NMT, accreditation of educational programs, development, applicants, teachers, military operations, transformation, strategy.

Figures: 3, References: 25

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ТРАНСФОРМАЦІЯ ВИЩОЇ ОСВІТИ УКРАЇНИ В УМОВАХ ВОЄННОГО СТАНУ

У статті визначено основні проблеми системи вищої освіти за період воєнного стану: заподіяння шкоди фізичному та психічному здоров'ю учасників освітнього процесу, знищення закладів освіти, відтік викладачів та студентів за кордон, неможливість проводити навчання в умовах постійних повітряних тривог та обстрілів, зниження мотивації та продуктивності освітян. Проаналізовано існуючі зміни в системі освіти від уряду та МОН: підвищення вартості навчання, у середньому на 10%, запровадження системи грантів на навчання за умови отримання високих балів НМТ (національного мультипредметного тесту), об'єднання та зменшення кількості існуючих ЗВО майже у 2 рази. Запропоновано ефективні напрямки трансформації системи вищої освіти за думкою авторів: підтримка освітян, відбудова постраждалих ЗВО, створення основ ґрунтовної трансформації системи вищої освіти шляхом модернізації мережі ЗВО, підтримка європейських партнерів, укріплення взаємодії з базами практики для студентів (дуальна освіта), наближення змісту освітніх та професійних стандартів до стандартів ЄС, побудова системи легкого та ефективного доступу до вищої освіти з усіх регіонів нашої країни та із-за кордону, а також посилення вимог до рівня підготовки вступників. Але першочерговими кроками, на думку авторів мають бути саме збереження науково-педагогічного складу і потенціалу ЗВО для прискорення розвитку якості вищої освіти у складних умовах сьогодення, та підвищення рівня якості вищої освіти шляхом модернізації мережі закладів та ефективна державна підтримка.

Ключові слова: вища освіта, ЗВО, НМТ, акредитація освітніх програм, розвиток, здобувачі, викладачі, воєнні дії, трансформація, стратегія.

Statement of the problem. The full-scale war in Ukraine simultaneously changed not only the lives of the entire population of the country, but also became a negative trigger for changes in social relations and all spheres of life. Immediately, global movements took place in the economy of the state, fields of education, medicine, culture, social protection and the private sector. During the COVID-19 pandemic, Ukrainian higher education system was already forced to carry out a rapid structural and functional restructuring and to change virtually all components of the educational process from offline to online mode [1]. But if during the pandemic, the negative consequences only affected the health of participants in the educational process, higher education institutions now face the task of preserving not only the health of their members but also their lives. During the war, the vector of European integration in the field of higher education has practically not changed, even though difficult conditions, higher education institutions must ensure not only safe learning conditions but also guarantee proper quality and access to educational services, regardless of the applicants' location. In wartime, the social sphere of the state always suffers the most [2]. The war and its consequences will have a long-term impact on the education system because the war began in the middle of the academic year and no sphere of life was ready for it. Ukraine's higher education system immediately faced a range of problems, the main ones being the physical destruction of educational institutions, their damage, management and demographic problems that arose due to the significant emigration of students and teachers to foreign countries in the first months of the war. Fortunately, these problems were promptly identified and the government, the Ministry of Education and higher education institutions were able to effectively ensure the resilience of the higher education system of our country.

Analysis of the latest research and publications. Among the latest publications on the challenges facing the higher education system during the war and the ways out of the crisis, the research of some scientists deserves particular attention. Y. Nikolaev, H. Riy and I. Shemelynets

in their work «Higher Education in Ukraine: Changes Due to the War: An Analytical Report» provided a general description of the system of higher education in Ukraine and public policy in the field of higher education after February 24, 2022. They characterized the losses of the Ukrainian higher education system due to the COVID-19 pandemic, analyzed the experience, challenges and directions for supporting displaced educational institutions, proposed directions for the recovery and transformation of Ukraine's higher education system [3]. I. Sologub, Y. Horodnichenko and Beatrice Weder di Mauro in the work «Rebuilding Ukraine: Principles and Policy» analyzed the state of Ukraine's European integration and post-war recovery, with particular attention to the reforms of state governance and educational reforms during and after the war [4]. A general overview of the humanitarian situation in Ukraine, including the education system, is presented in an analytical note by O. Pyshchulina [2]. The «Education 4.0: Ukrainian Dawn» program reflects the features of Education 4.0, which corresponds to the requirements of human recourses of Industry 4.0 and harmonizes the domestic and European educational spaces [5]. However, the issues of restoring the domestic education system, integrating it into the European educational space, resolving the funding for the repair of damaged higher education institutions, preserving the teaching staff and students under the conditions of constant air raids, shelling and life threats, as well as conducting classes in these terrible conditions, remain unresolved.

The aim of the research is to analyze the functioning of the higher education system in Ukraine, to identify the main problems and challenges that arose in the first days of full-scale war and continue nowadays, as well as to find the most effective ways to solve them, stabilize and preserve the domestic higher education system, and bring it closer to European standards.

Presentation of the main material. According to statistics, before the war, Ukraine's higher education system had about 1 million people who studied at bachelor's and master's educational programs in institutions of all forms of ownership. In February 2022, according to operational data of the Ministry of Education and Culture of Ukraine, the higher education system had 275 institutions. According to experts' estimates, the amount of damage caused to the infrastructure of Ukraine currently is almost 136 billion US dollars, of which 8.2 billion or 6% was caused specifically to the Ukrainian educational infrastructure [6]. At the end of the first year of the war, a total of 361 educational institutions were destroyed and another 2.556 were damaged. The largest percentage of destroyed higher educational institutions (HEI) is in Zaporizhzhia and Donetsk regions, and damaged ones are in Kharkiv region [7]. According to the calculations of the Kyiv School of Economics (KSE Institute), at least 533 educational institutions, 300 kindergartens, 196 medical institutions, 129 factories and enterprises were damaged, destroyed or captured in Ukraine during the year since the beginning of the military aggression [2]. These educational institutions were mostly located in the regions that suffered from a massive and long-term enemy attack: Kharkiv region (28 HEI), Dnipropetrovsk region (22 HEI), Odesa region (17 HEI), Zaporizhzhia region (13 HEI), Donetsk region (10 HEI). According to the Ministry of Education and Science of Ukraine, as of December 2023, 3.798 educational institutions were affected by bombing and shelling, 365 of them were fully destroyed [8].

After the declaration of martial law in Ukraine, in order to preserve the lives of all participants in the educational process, the Ministry of Education and Culture of Ukraine sent an instructional letter № 1/3276-22 to the heads of educational institutions on February 25, 2022 with a recommendation to suspend the educational process and introduce additional vacations, during which it was necessary to prepare the necessary normative – legal bases for the further functioning of educational institutions in the conditions of war [9]. This holiday period was effectively used by HEI to adapt to the situation depending on the distance to the front line. HEI was divided by regions – remote from the line of active hostilities (Vinnytsia, Volyn, Ivano-Frankivsk, Zakarpattia, Lviv, Rivne, Ternopil, Khmelnytsky, Chernivtsi region) and front-line regions (Zaporizhzhia, Dnipropetrovsk, Kyiv, Kharkiv and others) or temporarily occupied territories, in order to decide how to continue the educational process.

Since the beginning of March 2022, the Ministry of Education and Science of Ukraine has introduced the monitoring procedure for informing about the current situation in higher education institutions, current forms and principles of education. The main directions of monitoring the operation of HEI under wartime conditions were: the protection of the lives and health of students and university employees, the evacuation of HEI from combat zones, the possibility of their relocation to safer regions, the introduction of special learning conditions for participants in military operations and the operational adjustment of educational process schedules.

A noteworthy fact is the simplification of the accreditation procedure for educational programs in higher and professional pre-higher education institutions. On March 16, 2022, the government extended the validity of existing accreditation certificates for educational programs until July 1 of the year following the year in which martial law is terminated or lifted in Ukraine. From March 2022, it was allowed to conduct accreditations online and make decisions about conditional accreditation without conducting accreditation expertise or paying for it [10]. In April of the same year, the National Agency for Higher Education Quality Assurance approved a temporary accreditation procedure for educational programs, which included the provisions of the mentioned government resolution [10].

In March-April, almost all higher education institutions resumed distance learning. The Ministry of Education advised students of non-graduation courses to transfer part of the educational components, which are difficult to complete, in a distance or mixed format to next year and allowed to end the year early. During the war, the requirements for certification of higher education applicants also decreased. For example, the government canceled the Unified State Qualification Exam (USQE) for medical students as a certification and replaced it with a comprehensive, practice-oriented qualification exam [11]. It should be noted that medical students in Ukraine take the USQE, which includes the integrated test exam «KROK», the Objective Structured Practical (Clinical) Exam, and a professional English exam. Later, a similar decision was made in 2022 to cancel the USQE for other specialties [12].

The Ministry of Education also allowed vocational pre-higher and higher education institutions to independently choose the form of certification for graduates during the first year of the war. This allowed institutions to replace the preparation and defense of bachelor's and master's theses with other forms of control. Additionally, the percentage of plagiarism checks on theses was reduced. Regarding admission to higher education institutions, changes were also made – the traditional External Independent Testing (EIT) was replaced by the National Multidisciplinary Test (NMT) for bachelor's level admission, and the Unified Professional Entrance Test (UPET) and Unified Entrance Exam in a foreign language (UEE) were replaced by the Master's Test of Academic Competence (MTAC) and the Master's Comprehensive Test (MCT). Conduction these exams online opened more opportunities for applicants from frontline and occupied territories, and certain privileges were also provided to them. A very important step at present is the possibility of applying to Ukrainian higher education institutions by taking exams abroad. As of 2024, temporary exam centers abroad were established in 57 localities across 32 countries (EU countries, UK and Moldova) for the NMT and in 35 localities across 26 countries (EU countries, Switzerland, UK, Georgia, Canada, Moldova, US and Turkey) for the additional session [13]. By the end of the 2023-2024 academic year, 20.204 people took the NMT abroad during the main session and 2.894 took it during the additional session [13]. The NMT is the most viable option under the conditions of war since conducting full-fledged external testing is very difficult. The only drawback of the NMT, according to experts, is the inability to choose subjects, making math unnecessary for humanity students and Ukrainian history unnecessary for engineering students. Another important aspect is the absence of threshold scores for the NMT, MCT and MTAC in 2022. Thus, graduates could enter higher education institutions with only one correct answer per subject or by guessing blindly during the test.

Another significant issue is the funding of the higher education sector from the state

budget, which was reduced by 10% for certain budget programs, with the main administrator being the Ministry of Education and Science of Ukraine (budget program 2201160 «Personnel training by higher education institutions and ensuring the functioning of their practical bases» and higher education institutions under the Ministry of Health of Ukraine). Overall, in 2022-2023, the state funded higher education institutions proportionally to the number of students. Unfortunately, many students who studied with contract lost the ability to pay for their education due to the war. In this case, educational institutions provided deferments or granted academic leave to students. Later, the government decided to transfer students living in regions where military actions were taking place to state-funded places. At the end of 2022, based on this decision, an additional 13.000 students were studying at state-funded places [12, 13].

We would also like to note the unpleasant, in our opinion, changes in the higher education system during the war: an increase in tuition fees and the government's plans to reduce the number of higher education institutions and reorganize them. According to Education.ua, in 2023, the average annual tuition fee in higher education institutions increased by 2.959 UAH, or 14.4%, compared to 2022. The average annual fee was 23.491 UAH in 2023, compared to 20.532 UAH in the previous academic year, and the prices are expected to rise even more in 2024 (Fig. 1) [14].

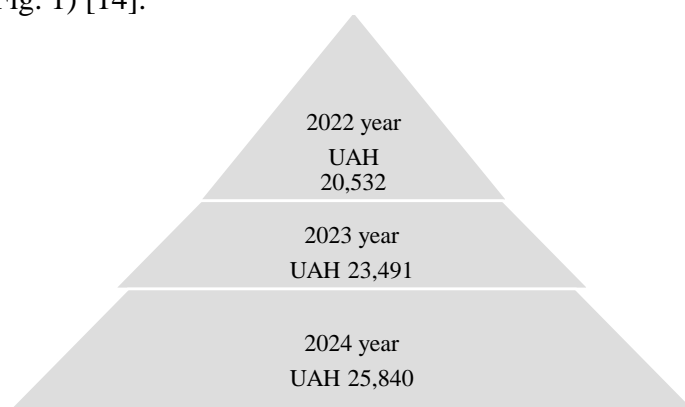


Fig. 1. The increase in the price of education at higher education institutions in 2022-2024 [15]

The specialties in which the tuition fees increased the most are presented in fig. 2.

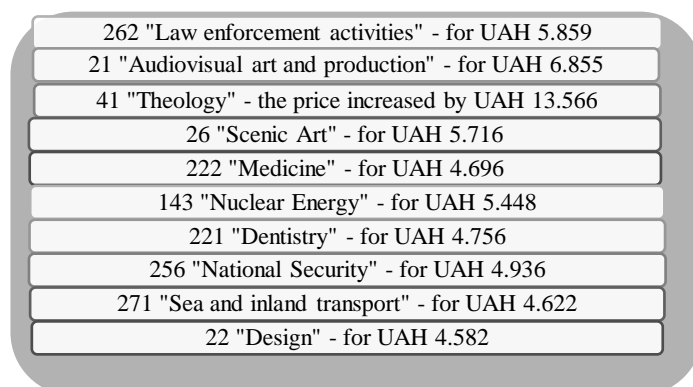


Fig. 2. Specialties for which the cost of education has increased the most [16]

This year the Ministry of Education and Science is offering students grants for tuition ranging from 15.000 to 50.000 UAH. However, to qualify for a grant students need to score 150 or 170 points on two of four NMT subjects, depending on the specialty and grant level [16]. A student can receive a grant if: they are applying for a bachelor's degree (or a medical, veterinary or pharmaceutical master's degree) after school or college; they are applying for full-time or dual education on a contract basis; they have NMT results of at least 150 points in any two subjects (for a first-level grant) or at least 170 points (for a second-level grant). The grant amount is

determined based on the NMT result and the specialty coefficient. With the NMT score of 150 points or higher in any two subjects, it is possible to receive a grant of 15.000 UAH. A second-level grant provides 25.000 UAH for applicants with a score of 170 or higher in any two subjects. Depending on the specialty, the grant amount may be larger (multiplied by the corresponding coefficient) [16]. According to the Ukrainian Center for Educational Quality Assessment, in the last year only 415 NMT participants scored 200 points on two subjects during the main test session [16].

We also consider the government's initiative to consolidate and reduce the number of higher education institutions as a sad change. According to the rules, two higher education institutions are enough for a population of 350.000. From the 170 state higher education institutions the government plans to leave 100, and the process of consolidation will continue this year after the admission campaign. For example, there are plans to merge Mykolaiv National University named after Sukhomlynskyi with the National University of Shipbuilding to form a multidisciplinary University of Shipbuilding and Southern Development; Odesa State Environmental University with the Physico-Chemical Institute of Environmental Protection and Human Health with Odesa National University named after Mechnikov; the Ukrainian Research Institute of Ukrainistics with Taras Shevchenko National University of Kyiv; the Ukrainian Academy of Printing with the National University «Lviv Polytechnic»; Polissya National University with Zhytomyr State University named after Ivan Franko; Lutsk National Technical University with Donetsk National Technical University [16].

In the first year of the war an online survey was conducted among Ukrainian higher education institutions, that were affected by military aggression: Kyiv Taras Shevchenko National University (heavy artillery shelling took place), V.N. Karazin Kharkiv National University (buildings were destroyed by heavy bombings), National University «Chernihiv Collegium» (was under blockade for several weeks, with no water, electricity or heat) and Rivne State University for the Humanities (located in a city that experienced bombings during the early months of the war). Classes continued online, students and teachers were divided into three groups: those who stayed in Ukraine (the largest group), those who went abroad and those who remained in occupied territories [17]. According to the online survey, 97.8% of respondents reported a deterioration in their psycho-emotional state, 84.3% noted depression, 86.7% complained of exhaustion, 84.4% felt nervousness, 51.8% felt loneliness, and 76.9% reported anger. Unlike teachers, students experienced higher levels of depression and exhaustion due to the war, women felt more nervous and tired. Along with worsening mental and emotional health, respondents exhibited high levels of fear, burnout and feelings of isolation [18]. Throughout the war, teachers also noted an increase in their workload up to 50% compared to the pre-February 2022 period. They name the main reasons: the need for additional time for preparing tasks and psycho-emotional support for students, loss of time during the learning process due to air alarms, reduced productivity due to sleepless nights, etc.

In our opinion, the pandemic timely prepared the Ukrainian education system for further challenges, as everyone had experience with online learning and using the necessary tools for work, as a significant number of students and teachers were in shelters or abroad. If the right decisions in the higher education sector had not been made at the start of the war, the consequences of existing challenges could have been even more destructive and costly. Certainly, some things could have been done better, but with the existing resources, time and capacity constraints, the made decisions seem the most balanced at the present time. Thanks to the systematic, coordinated and motivated work of higher education institutions, educators, and students, it was possible to minimize the negative impact of military aggression and preserve the human capital as much as possible. The educational system survived, continues to function and provide educational services, has become more stable and reformed. People played a huge role in this: their cohesion, motivation, desire to support each other, as well as the coordinated internal policy of Ukrainian higher education institutions.

The international community's assistance to Ukrainian educators has also been

invaluable. The Association Agreement between Ukraine and the EU outline principles of active cooperation in the field of higher education aimed at reforming and modernizing the system, introducing innovations within the Bologna Process, improving the quality of higher education at all levels, facilitating access to higher education, strengthening ties between higher education institutions, also enhancing student and teacher mobility [19]. For the development and rebuilding of the higher education system in the post-war period, full consolidation of efforts by the Ukrainian education community and international partners will be crucial for implementing innovative approaches. The existing European Commission program for 2023 has allocated €100 million in financial aid for rebuilding Ukrainian educational institutions. Additionally, funding for student and academic mobility has been increased, and a new project for Ukrainian researchers – «Marie Skłodowska-Curie Actions for Ukraine» has been launched within the «Horizon Europe» program [20]. During the war, many EU countries accepted Ukrainian students and researchers, provided them with support and continue to expand connections, which is critically important due to the increasing number of Ukrainian students in Europe [21]. First and foremost, domestic education representatives are Ukraine's ambassadors in Europe, serving as «bridges of communication» and conducting Ukraine-related research that helps spread knowledge and present Ukraine on the international stage. Having stayed abroad, integrated and achieved success, they will form a unifying core for the Ukrainian diaspora, which was previously dominated by labor specialists. This is important, as we see in the current situation, because an educated and elite Ukrainian diaspora will create a more positive impression abroad and enable states to make more favorable decisions for us. A very important step is creation of joint master's programs, for example: International Financial Management (Donetsk National University named after Vasyl Stus – Tsenov Academy of Economics, Bulgaria), «EMJM ChEMoinformaticsplus – Artificial Intelligence in Chemistry» (Kyiv Taras Shevchenko National University), «Resource and Energy Efficiency and Circular Economy» and «International Master Degree Program Design: Sustainable Transport Engineering» (Kyiv-Mohyla Academy and National Aviation University) [21].

The main list of directions for actions in the field of education and science that emerged due to the introduction of martial law in Ukraine was formulated by the relevant committee of the supreme council of Ukraine, based on the submission of the Ministry of Education [22].

The main ones include:

- 1) audit of infrastructure losses;
 - 2) development of a plan to restore educational infrastructure;
 - 3) organization and implementation of the introductory campaign;
 - 4) formation of a state order for the personnel training in war conditions;
 - 5) audit of displaced higher education institutions;
 - 6) introduction of changes and loyalty programs in payment for the contractual form of education;
 - 7) making necessary amendments to the Law of Ukraine «On Higher Education» regarding the extension of the temporary composition of the National Agency for Higher Education Quality Assurance and the policy of creating corporate higher education institutions;
 - 8) launch of pilot projects for the creation of corporate training centers on the basis of public-private partnership in the post-war period;
 - 9) regulation of academic mobility programs in wartime conditions;
 - 10) development of measures to attract foreigners to enter domestic higher education institutions;
 - 11) development of motivational programs for higher education graduates who went abroad due to the war to return to Ukraine;
 - 12) standardization of licensing conditions for admission to regulated specialties
- [23].

In the Strategy for the Development of Higher Education in Ukraine for 2022–2032, which was approved the day before the war began, the directions and goals of the overall

transformation of the higher education system are outlined. This strategy was developed over a year with the involvement of many experts and analytical centers and is designed to form the foundation for an effective higher education system and outline directions for future development. The strategy includes five major strategic goals, 25 smaller operational goals and indicators for their achievement (Fig. 3).

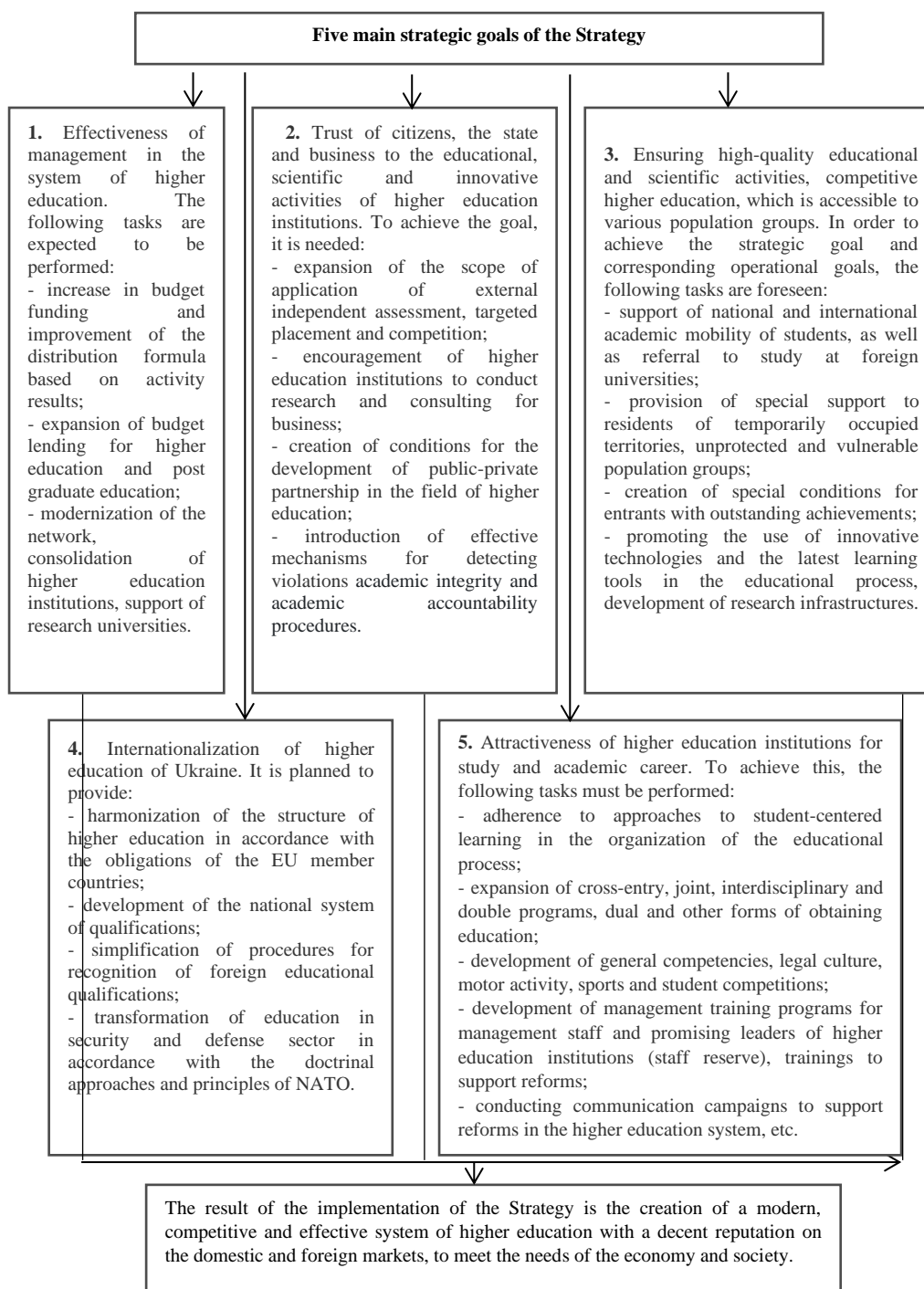


Fig. 3. Strategy of the development of higher education in Ukraine for 2022-2032 [23]

In the recently published analytical document «Reconstruction of Ukraine: Principles and Policies», there is a section titled «Educational Reforms During and After the War» which clearly describes the state of the domestic education system and proposed measures for its reform, some of which were partially implemented in Ukraine before the full-scale military invasion, along with the impact of the pandemic and war on these changes [24]. In April 2022, the president created the National Council for the Recovery of Ukraine from the Consequences

of the War. The main tasks of which was developing a system of measures for post-war recovery of the domestic education system and preparing strategies for priority reforms needed during the war and post-war periods [25]. In the summer of the same year, a draft Recovery Plan for education and science was developed, which includes a section on «Higher Education» with 7 main goals and tasks. This plan correlates with the Strategy for the Development of Higher Education for 2022–2032, especially concerning the modernization of educational institutions [23]. When discussing recovery, it is important to note that the process should begin with educational institutions that have suffered the most in terms of material, technical, organizational aspects and personnel losses. First, it is necessary to analyze the damage, identify the remaining human resources and set the following goals.

In late 2022, the government presented the «Education 4.0: Ukrainian Dawn» program, developed by the Ministry of Education and Science [5]. This program is based on the Recovery Plan provisions and aims to create an education system over the next 10 years that will harmonize the Ukrainian educational space with the European one and meet the human resource requirements of Industry 4.0. One of the primary goals of the higher education system today is to increase trust in the educational, scientific and expert activities of higher education institutions and to form a modern network and infrastructure of higher education.

Conclusions. According to experts, in the near future, Ukraine should focus on addressing the problems caused by war-related destruction; rethinking the principles of the education system's operation to ensure its comprehensive development; creating the necessary conditions for transforming the higher education network to meet the social and economic needs of the country; bringing the higher education system closer to European standards; ensuring a modern, innovative learning and research environment; strengthening cooperation with enterprises at various levels to involve students in practical training [24]. In turn, the state needs to take the following steps: ensure the transition from quantity to quality of educational institutions; to make only systematic balanced decisions and conduct a consistent balanced policy, if possible, combining all the higher education institutions into a single organically functioning system [24].

The measures proposed by the Ministry of Education and Science of Ukraine can be considered as first-line measures, as they do not address many other functional aspects of the higher education system in Ukraine. In addition to the main directions of public administrative activity mentioned by the Ministry, which correspond to the demands of the time, we suggest adding a few more important directions, that we believe, are also crucial for ensuring the resilience of the domestic higher education system.

The first direction is the preservation of the scientific and pedagogical potential of higher education institutions, which is an important direction for improving the quality of higher education in today's difficult conditions. Certain steps have already been taken by both the government and the Ministry. The second direction is improving the quality of higher education through the modernization of the higher education network, specifically the development and state support of a capable network of higher education institutions. Institutional leaders should influence to the organizational, scientific and education culture; motivate the development of distance education and introduction of educational innovations; stimulate the creation the industry of modern teaching aids, etc. The third direction is the use of modern educational programs, technologies, information resources, the partnership of higher education institutions with industry, science, other educational institutions, both domestic and foreign, the formation of an innovative environment, etc. Educational programs of domestic higher education institutions should adapt to the needs of the modern labor market, create a close communicative relationship between employers and institutions of higher education, both during the period of martial law and during the period of post-war reconstruction.

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