

Covid-19 and war implications for skill formation in Ukraine

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This chapter aims to explore how the Covid-19 gained experience helped VET providers to acquire and develop their resilience to the disruptions and volatility of environment (e.g. obstacles brought by the war). Firstly, there are disclosed the nature and extent of disruptions of the VET provision caused by the pandemics and war. Secondly, there are analysed the public policies and strategies which facilitated resilience of the VET provision to the disruptions of pandemics and war. The essential part of the study explores strategic tools and management practices applied by VET providers as a response to significant social shifts caused by the war, for ensuring institutional flexibility and a set of new safety requirements.

Keywords: vocational education and training, skill formation, Covid-19, war in Ukraine

Introduction

The skill formation ecosystem of Ukraine since the collapse of the Soviet Union has experienced different transitions and critical junctures, including complicated transition of the VET provision to the conditions of the market economy, curriculum, reforms, trends of Europeanization of the VET institutions and processes after the Dignity revolution in 2014 and many others (Melnyk 2022; Tütlys et al 2021).

The critical junctures related to the disruptions caused by Covid-19 and military aggression of the Russian Federation launched in February 2022 are exceptional in many senses – not only by their radical and abrupt character, highly disruptive and destructive impact on society and VET provision, but also by actualization previously accumulated unsolved problems, bringing important changes in the vectors of the future development of VET and its role in society. The closeness of these disruptions in the timeline also created opportunities for the VET system and VET providers of Ukraine to use the know-how of adaptation of VET provision to the Covid-19 closure conditions for the fast adjustments of the VET providers and their educational activities to the conditions of the war.

This chapter aims to explore how the Covid-19 gained experience helped VET providers to acquire and develop their resilience to the disruptions and volatility of environment (e.g., obstacles brought by the war). Firstly, there are disclosed the nature and extent of disruptions of the VET provision caused by the pandemics and war. Secondly, there are analysed the public policies and strategies which facilitated resilience of the VET provision to the disruptions of pandemics and war. The essential part of the study explores strategic tools and management practices applied by VET providers as a response to significant social shifts caused by the war, for ensuring institutional flexibility and a set of new safety requirements.

The core set of research methods includes a historical analysis of regulatory documents, VET statistic mining, as well as targeted interviews with VET managers and teachers, forecasting methods and a scenario-building approach.

Institutional development of the skill formation system of Ukraine before disruptions

Covid-19 closure, and the military aggression of the Russian Federation constituted significant critical junctures of the institutional development of skill formation in Ukraine. Skill formation in this country is characterized by the specific development of VET providers, including specific linkages between education and employment, extra social responsibility of VET and fragmentation of social partners involvement (Melnyk 2022).

Starting from the collapse of the Soviet Union skill formation institutions in Ukraine experienced the transformations of post-communist transition and building of new skill formation institutions on the vestiges of the Soviet legacy or from the scratch (Melnyk 2022; Melnyk et al 2021). This implied rather protracted and complicated processes of dealing with the Soviet legacy of institutions and processes under the new (market-oriented environment) conditions. The main change in skill formation was shift from the planned system of skill formation oriented to the demand of skills in the state-led and planned economy to the school-based and skill supply-oriented system struggling with the challenges of meeting the skills needs in the emerging market (Melnyk 2022; Melnyk et al 2021). Increasing autonomy and power of skill formation institutions, together with the freedom in choosing skill formation pathways lead to the massification of the higher education and significant decline of VET provision. These processes were accompanied by the change in mass behavioural model of youngsters in favouring higher education pathway of skill formation, what in longer term has led to diploma inflation due to growing gap between provided academic degrees and demand of skills in the labour market.

The beginning of the 21st century was marked with differentiation of the skill formation pathways, development of new types of providers and standardization of the VET curricula by formal adoption of competence-based approach. It should be also noted that the system of occupations in the legal meaning was not able to suit real labour market needs and consequently it led to the separation of training practices from companies' requirements.

Another significant critical juncture was “Europeanization” of skill formation system and processes after signing of the Association Agreement between Ukraine and the European Union in 2014 resulting from the Dignity Revolution (Melnyk 2022; Melnyk et al 2021). This process brought important changes in the field of skill formation, including systemic approach of reforms in the field of VET and qualifications, orientation to the development of national system of qualifications, strengthening of the autonomy of VET providers in the curriculum design, efforts and steps towards decentralization of the design of qualifications and VET curricula, as well as focus on the regional and sectoral development of VET provision and support to capacity building of VET providers in the regions, international mobility of the VET professionals.

Overall, before the disruptions caused by the Covid-19 and the military aggression of the Russian Federation, skill formation system, and especially VET were on the track of highly ambitious, challenging and systemic transformations aimed to the development of open, learner-centred and market-oriented institutions and processes.

Covid-19 as critical juncture in the development of skill formation in Ukraine

Covid-19 pandemic related disruptions caused numerous implications to the skill formation, including deterioration in the quality and accessibility of education, development of “touchless” training approach, modification of equipment and communication models.

One of the most significant implications of pandemics to labour market is fostering of digitalization of the work processes, especially in the sectors of services, retail trade, logistics. what increased the risk of technological unemployment for the low-and-medium skilled people working in these sectors, predominantly women, as well as increased the demand of continuing training and reskilling of these population groups (Yuzkiv Sakhno Kobernik 2021). What regards the supply of human capital and skills, the pandemics further exacerbated demographic crisis and emigration of the population: the data of International Organization of Migration the total volume of emigrants from

Ukraine in 2021 constituted 1 million 167 thousand persons or by 11 percent more than in the pre-Covid year 2019 (Kolomiyets Samoyliuk 2021).

Closure of schools exacerbated educational inequalities because of significant differences in accessing the online learning measures, as well as due to regional differences in switching from distance learning to mixed learning during the adaptive quarantine period, when the country was divided into epidemiological safety zones: "green", "yellow", "orange" and "red" (Nazarenko Polishchuk 2021). Like in many other impacted countries, students, teachers and lecturers also experienced various problems related to mental health: increased anxiety, depression, stress, fear. Meanwhile, employers' requirements were changing in a more dynamic manner and simultaneously with VET adaptations.

Fast transition to the online and mixed formats of education was one of the key organizational changes brought by Covid-19 to all educational institutions, including VET (Nazarenko Polishchuk 2021; Kolomiyets Samoyliuk 2021). It also brought the educational institutions dependent on the instructions and guidelines from the Ministry of Education and Science of Ukraine, lack of resources and HCD capacities. Having in mind specificities of the institutional settings of skill formation, such as lack of trust of education and training providers in the central government authorities and their dependence on these authorities as a consequence of strongly centralized education system, the cooperation between the schools and governmental authorities in dealing with challenges of closure was quite fragmented, and specific needs of support from the VET schools were often ignored, neglected or satisfied with significant delays (Schreyer et al 2022). VET institutions often suffered from the unpreparedness for a sharp transition to distance learning because of a lack of material and technical base, shortages of expertise and know-how of teachers and trainers, as well as a lack of appropriate training and methodological recommendations on the organization of educational and practical training processes (Schreyer et al 2022). At the beginning of the pandemic the performance of educational processes depended a lot on parents' and educators' abilities. However, in the academic year of 2020/2021 the government and education system implemented different national and local level distant education support measures, such as the information campaign "School, we are ready" (together with UNICEF-Ukraine), an online program for vocational training and exchange of experience between teachers on distance education issues (EdCamp Ukraine), majority of schools have acquired distance learning technologies (such as Google Classroom, Zoom, Microsoft Teams, etc.) provided on free-basis with the government support (Nazarenko Polishchuk 2021). The Ministry of Education and Science of Ukraine issued "Recommendations on the implementation of blended learning in institutions of professional pre-higher and higher education", which, among other things, considered ways to prevent plagiarism in education (Association of the Ukrainian cities 2020). The deepening of educational

inequality due to the closure of educational institutions has been especially noticeable in the differences of accessibility and quality of online resources in the rural and urban schools. For example, in the winter of the study year 2021/2022, in the communities of 5 regions of Ukraine, difficulties were recorded with providing students and teachers with computer equipment and access to the Internet, and therefore, there were problems with equal access to education in conditions of distance learning for students from low-income families and children with special needs, for children in regions with different IT infrastructure (Nazarenko Polishchuk 2021).

In December 2020 the Ministry of Education and Science together with the Ministry of Digital Transformation launched an updated version of the "All-Ukrainian School Online", which was hosted on a specialized online resource (<https://osvitoria.org/en/the-all-ukrainian-online-school/>). This national wide tool became used by an increasing share of teachers and students engaged in online learning. Overall, during the pandemics there were implemented different initiatives in the field of digital education together with the different international organizations and partners. Seeking to promote development of digital skills, the Ministry of Digital Transformation (DT) of Ukraine was established in 2019, and DT Officers (Deputy Minister responsible on digitalization was appointed) were appointed in 2020 at the Ministry of Education and Science (MoES) to drive the digital transformation in education. In 2021, the Directorate of Digital Transformation in Education was established within the MoES. Around this time, over 90 projects were launched, including EU initiatives such as the SELFIE – a free, customizable tool to help schools to enhance capacity to use digital technologies in learning. Moreover, the ILO, in collaboration with the MoES, developed e-learning solutions for VET institutes focusing on the hospitality, mechanical, electrical, and garment sectors. Some of these solutions include a national e-learning platform to make digital learning materials more accessible, e-courses for instructors on e-learning, teacher training, or interactive training modules for students (ILO 2022).

The support of international donors has been very important for the adjustment of VET provision to the new requirements. For example, under the international support project EU4Skills coordinated by GIZ there were implemented different instruments, like informational management system for VET schools, websites of VET schools were upgraded, teacher training in IT area were conducted, e-learning materials were developed as pilots in seven regions.

War as critical juncture in the pathway of EU integration reforms of VET and skill formation in Ukraine

Military aggression of the Russian Federation against Ukraine launched in February 2022 impacted significant changes in the institutional development of skill formation in the country at the different levels. In terms of timing the disruptions of war followed the disruptions brought by the Covid-19 pandemics, when the population and skill formation institutions were already progressing in adjusting to the conditions and requirements imposed by the lockdowns from the one side, but the accessibility and quality of public VET provision significantly compromised. What have been the implications of war for the VET provision and qualifications system in Ukraine and what were the policy responses?

Implications of the war for VET provision

With the beginning of war, the public VET system of Ukraine faced extreme additional pressure (to that imposed by Covid-19) due to factors such as migration, dynamic economic changes caused by war (e.g., relocated business from Eastern regions to Western part of Ukraine), and lack of funding, exacerbated by the sharp increase of funding need for national defence. Displacement of people is one of the key specific challenges faced by the VET system of Ukraine during the war compared to the Covid-19 closure. Over 8,5 million persons fled from war in Ukraine between February and mid-June 2022 – 12% of its population, and more than 7 million people are estimated to have been internally displaced within Ukraine (UNOCHA 2023; UNHCR 2023). Despite such global and complex challenges, Ukraine's VET system managed to stabilize the situation and adapt the activities of specialized management bodies and VET schools to new conditions in about three months period since the beginning of the active phase of the war. This section will review implications of war to VET related to infrastructure, VET provision regimes, learners conditions, VET teaching staff.

Implications for VET infrastructure

War inflicted damage and long-term effects for human capital, infrastructure and social-institutional settings of VET provision. During the war, as for January 2023 13 VET schools were completely destroyed, and 15 institutions could not be relocated from the temporarily occupied territories (State Scientific Institution Institute of Educational Analytics 2022; 2023). That is, the direct loss of the number of VET schools in the country is 28, or 4.0% of the total number the beginning of 2022 (694 schools). In the conditions of martial law, the infrastructure of VET institutions continues to suffer significant losses. According to the operational information of the departments of education and science of the regional and Kyiv city military administrations, as of August

1, 2023, 13 such institutions were destroyed, 146 institutions have been damaged with varying degree (State Scientific Institution Institute of Educational Analytics 2023). As of the end of January 2023, 80.0% or 536 VET schools were teaching in mixed and full-time format, 31.0% or 208 VET schools have been teaching in face-to-face format (State Scientific Institution Institute of Educational Analytics 2023). According to the operational information of the departments of education and science of the regional military administrations, as of January 25, 2023, the educational process has been carried out by 93% of VET institutions, of which: 49% – in a mixed format; 31% – in the direct contact format; 20% - remotely (State Scientific Institution Institute of Educational Analytics 2023). In 2022/2023 172 VET institutions carried out the educational process according to the dual form of training, 10438 students studied under it, 1003 enterprises, institutions, and organizations were involved in this process (State Scientific Institution Institute of Educational Analytics 2023).

Implications for the geographical accessibility of VET

In the war mostly impacted Donetsk, Luhansk, Zaporizhzhia and Kherson regions, 70 out of 108 VET schools are in the temporarily occupied territory (State Scientific Institution Institute of Educational Analytics 2023). Out of these 70 VET institutions, 55 institutions were relocated to the Ukraine controlled territory. Given the existing threat to life and health, many VET learners from these regions were forced to move to other regions of Ukraine and/or beyond its borders. In addition, some students live in the areas impacted by combat actions or are under temporary occupation and encirclement. Premature graduation of graduates in the academic year of 2022/2023 took place in 22 VET schools of the Kherson region and 16 institutions of the Zaporizhzhia region (except the city of Zaporizhzhia) (State Scientific Institution Institute of Educational Analytics 2023). Some VET schools redistributed their students from the combat affected areas to the VET schools in the safe regions. The MoES in this regard supported transition and recognition of the learning outcomes as an induced response for internal mobility of students.

Another faced challenge has been preparedness of the infrastructure of school in the war impacted regions for the functioning under the war conditions. According to the information available in the Ministry of Education and Science, only 31 VET schools were equipped with 38 civil defence facilities (State Scientific Institution Institute of Educational Analytics 2022). According to operational information as of June 15, 2022, 463 VET schools have dormitories, in which live 82163 people. 20% of them (16443 persons) are internally displaced persons (State Scientific Institution Institute of Educational Analytics 2022).

Implications for VET students conditions

As of January 1, 2023, the total contingent of VET learners numbered 230.5 thousand people, of which 12.7 thousand people were internally displaced persons, 17.5 thousand people are abroad, continuing their studies in VET schools in Ukraine remotely, 5.5 thousand people - in the temporarily occupied territory were enrolled (State Scientific Institution Institute of Educational Analytics 2023). Nevertheless, there is noticed recovering volume of enrolments in VET: in 2023, the approved volume of admission of VET applicants according to the quotas from regions is 92 799 persons, by 4672 persons or 5% higher compared to enrolment in 2022 (State Scientific Institution Institute of Educational Analytics 2022; 2023). The new management of the MoES was defined as one of the key priorities for the nearest future and for the strategic perspective of the Ukrainian VET development.

Implications for the VET teaching staff

The contingent of VET teaching staff has been also strongly impacted by the Covid-19 and the war-related factors. As of July 1, 2022, 23905 teachers worked in the field of vocational education and training in the country, of which 1258 (5.3%) were internally displaced, 904 (3.8%) were outside Ukraine, 472 (2.0%) persons were on leave without pay during martial law or on layoff, 654 persons (2.7%) were serving in the Armed Forces and the Military Academy. 372 persons (1.6%) resigned from the positions of VET teaching staff during the martial law (State Scientific Institution Institute of Educational Analytics 2022). As of January 1, 2023, 30201 teaching staff were still employed by the VET schools (State Scientific Institution Institute of Educational Analytics 2023).

Policy responses to the implications of war: systemic level adjustments of VET provision

Above-described implications of war required urgent responses of policy and legal regulation. On June 19, 2022, the Verkhovna Rada (Parliament) of Ukraine adopted a draft law providing for amendments to the current Law of Ukraine "On Vocational (Vocational and Technical) Education" No. 1312 (Verkhovna Rada of Ukraine 2022). The adopted changes make it possible to adjust the VET considering the realities of the war, the requirements of the modern labour market and the focus on the post-war development. One of the key changes of legislation is movement to the expansion of accessibility of VET and liberalization of the enrolment to VET, increasing role of adult education in VET and growing influence of the employers. Suggested new interventions are targeted to the reduction of the unemployment rate, ensure the rapid retraining of those who have lost their jobs, and most importantly, vocational training centres have acquired the right to enrol for practical training the learners of all age groups. In accordance with the adopted legislative norms, it is provided for the possibility of

obtaining vocational training without full general secondary education on the second level of the Ukrainian qualification framework. Citizens obtain the right to get a second vocational qualification via state funding in 3 years after obtaining the previous qualification if there are employment insurance and free places in the VET schools. There is also introduced the possibility to get permission to acquire VET qualification in another professional area with state or regional (municipal) funds, even in the absence of confirmed unemployment insurance in two cases: if due to the state of health a person has lost the opportunity to perform work in a previously acquired profession, as well as for the purpose of urgently meeting the needs of the labour market. Enrolment in VET institutions is detached from the place of registration of candidates, what enables internally displaced persons to access vocational education and vocational qualifications in the places where they have been temporarily settled.

Due to the war an educational cycle was considered as the national priority to ensure skilled labour force provision on the national level. The issue of waiving students and teachers of VET schools from conscription for military service during mobilization was approved by the government. Corresponding changes were made by the Law of Ukraine dated 04.14.2022 No. 2196-IX "On Amendments to Article 23 of the Law of Ukraine "On Mobilization Training and Mobilization" regarding the postponement of conscription for military service during the mobilization of certain categories of citizens", which entered into force on June 12, 2022 (Verkhovna Rada of Ukraine 2022). This amendment created equality of students and their rights at the different levels of education. The issue of certification of VET schools has been settled, namely, the state validity of certificates has been extended for the period of martial law.

There has also been approved the Regulation on the interruption of studies by vocational (vocational and technical) students and granting them academic leave in conditions of martial law, state of emergency or state of emergency (special period) (Ministry of Education and Science of Ukraine 2023). 365 people have already used the right to academic leave during the war period. Also, there have been introduced legal provisions concerning recognition of nonformal VET via the National Qualification Agency and newly established qualification centres.

Amendments were also made to the Standard Rules for Admission to Vocational (Vocational and Technical) Education Institutions of Ukraine, which regulate the admission of certain categories of persons to VET schools and define the list of documents to be submitted through the online application (Ministry of Education and Science of Ukraine 2023). From the 1st of July 2023, documents for admission to VET schools can be submitted online. Online enrolment tool was introduced for VET applicants in Ukraine via the State Database on Education (EDEBO) and the state operator AIKOM, creating equal opportunity for children from different regions.

Policy responses to the implications of war: organisation of VET provision

There were also provided different guidelines and recommendations to the VET establishments on how to organize the VET provision in the conditions of war. The martial law introduced after the Russian invasion forced many educational establishments to shift to emergency remote teaching which had been adopted during the Covid-19 pandemics. During the war one of the key challenges in providing online education is often occurring blackouts caused by the damages to the energetic infrastructure of the country. According to the recommendation issued by the Ministry of Education and Science, VET providers should provide theoretical lessons online, and practical training – in the school workshops, enterprises, and, where possible, in the online mode (Ministry of Education and Science of Ukraine 2022). When these opportunities are absent, practical training is postponed until the end of the martial law. This creates obvious difficulties and risks for both learners and for their future employers. One of the solutions of emerged problem is flexibilization of the existing qualifications and curricula by introducing micro-qualifications and micro-credentials. Ministry of Education and Science of Ukraine also prepared guidelines for VET teacher and school managers on the organisation of the online education, including special online course for development of needed competencies “On the distance and mixed learning formats” (Ministry of Education and Science of Ukraine 2022). VET teachers are advised and encouraged to use online educational materials, which they developed during the pandemics and to elaborate new materials by using YouTube platform and WordSkills Ukraine master classes. The Regional VET Methodological Centres of under the MoES significantly built on their Covid- 19 experience in supporting schools and teachers in re-arrangement of the training process, especially in assisting of creation of the e-content and electronic lessons, as well as facilitating teacher training in the different projects implemented with the support of international organizations. For instance, the project "E-TVET in Ukraine: Training continuity and modernization during COVID-19 and beyond", which was implemented by the ILO in 2020 and 2021 (ILO 2022). Representatives of regional educational methodological centres have been trained as support staff in the deployment of Microsoft Office 365 instruments of online education in 2020, Moodle usage, video conference software implementation in VET and now they continue providing such support to the VET schools. VET schools, universities and general education establishments was granted free access to the "G Suite for Education" service by Google corporation. In case of absence of possibilities of electronic training and learning other means of communication are used to get in contact with learners, including sending of the learning tasks and materials my emails, various messengers and phone conversations. One of the major problems is organization of the practical training in the war conditions due to significantly reduced availability of the training workplaces in the regions affected by the military actions. Virtualisation and ‘remotisation’ of the VET processes, including enrolment of students is one of the key strategies in coping with restrictions brought by

the war, for example by using chat-bots and virtual tours of the VET establishments (Verkhovna Rada of Ukraine 2023).

Resilience of VET providers: key factors

How VET institutions of Ukraine become resilient to the disruptions of war? OECD policy brief (2022) claims, that traditions of strong VET provision and interest of youth to VET in this country are important factors for both adaptation of the war refugees in the host countries, as well as for the post-war reconstruction of the country. Despite massification of higher education provision, the choice of VET pathway is quite controversial amongst the Ukrainian youth. The changes in the demand of skills caused by the war could further strengthen this trend. There is a high match in the demand of skills and qualifications provided by the VET in Ukraine both in the host countries, as well as in Ukraine, what also create opportunities for the host countries to invest in the training of war refugees thus contributing both to the economies of host countries and to the future recovery of Ukraine (OECD 2022).

Reforms in strengthening the VET provision and its orientation to the market needs before the Covid-19 pandemics and war, including implementation of the dual apprenticeship programmes, also contributed to development of resilience of the VET provision. In the context of martial law, the beginning of the decentralization of the management of the VET system of Ukraine launched in 2018 played a very positive and decisive role in terms of its preservation in the conditions of disruptions. The biggest share of effective VET support measures are carried out within the framework of the high autonomy of regional management bodies and VET schools. There can be indicated various examples supporting this statement. VET schools have effectively taken care about safety conditions for education of students by using the assistance of international partners. In 95% of VET schools, shelters have been arranged in accordance with the Requirements for the use and accounting of the fund of civil defence protective regulation, approved by the order of the Cabinet of the Ministers. Despite the military difficulties, 260 career centres have been launched in the state VET schools, whose activities are aimed at helping graduates of job-placement, in line with their right to get the first workplace, as well as popularizing VET and career guidance among children (International Labour Organization 2022; Schreiyyer at al 2022). There can also be outlined effective organization of communication activities in the VET schools which included holding open door days and other career guidance events in VET, running information sessions on the rules of communication in social networks for VET institutions (involving more than 1000 participants), launching in the social networks different sessions and platforms, such as "Vocational guidance", "Lifelong Learning hacks" and "Advantages of vocational education", organization of the All-Ukrainian Week of Vocational Education on the 22-26th of October 2022 with the events on the

national and regional levels and involving different actors: "Students' Day", "Employers' Day", "Teachers' Day" and "Profession Day" (State Scientific Institution Institute of Educational Analytics 2023).

The national wide VET promotion campaign was launched with support of international donors (EU4Skills project coordinated by GIZ) targeting at work gender stereotypes, popularization craftsmanship, supporting self-employment. The agency of VET schools has also been important in creating conditions for the rehabilitation and adaptation of military veterans in society. According to the operational information of the departments of education and science of the regional military administrations, as of January 1, 2023, 101 veterans and 5,327 children of war veterans received appropriate education in 414 VET schools, namely: 101 persons with the status of a war veteran: combat participants - 57, persons with disabilities caused by the war - 4, participants of the war – 40, children of combatants – 5,015, children of deceased combatants – 270, children of persons with disabilities caused by the war – 42 (State Scientific Institution Institute of Educational Analytics 2023). There are certain patterns discovered by the conducted national social survey in training ex-combatants and veterans (Kirillova Znoviak Kazanska 2023). For instance, males in the war-affected families have around 3 months to be reskilled or upskilled according to new labour market requirements. Females usually need 6 months for gaining a qualification with same complexity due to household duties carried in traditional Ukrainian family.

Autonomy of the VET schools and regional stakeholders also significantly contributed to the effective implementation of the national policy measures aimed to adjust the VET system to the conditions of the martial law. Here there can be mentioned implementation of the distance learning platform "Vocational Education Online". With the support of international partners, more than 80 online training courses have been developed, which are already posted on the specified platform. In the period from December 23, 2022 to July 14, 2023, 4000 users of this Platform were registered. The internal academic mobility program, introduced in 2022 also became an important tool for maintaining the contingent VET learners (Ministry of Education and Science of Ukraine 2022). In 2022, 316 people used the right to internal academic mobility, in 2023 - 222 people (State Scientific Institution Institute of Educational Analytics 2022).

Process and national priority for decentralizing of VET school system is also playing a significant role for enhancing closer partnerships of VET schools with regional communities and local employers. In average, 13-20 VET schools are transferring annually from the state funding to the regional budgets. It also helps to diversify resource pressure during the wartime.

National and international projects supporting the reforms of VET in Ukraine has also become highly important factor of resiliency by helping to mobilise both national and international expertise and resources in creating and developing needed measures. All national and international VET development projects since the beginning of the war have shifted their interventions from the reforms of the national policy to the direct support for learners and teachers and people-targeted measures. During the war the main priority is to satisfy the needs of suffering population and army, whereas political reforms are postponed or significantly redirected. The support from the international, especially EU funded programs is oriented to the strategic goals of development of VET, which include not only preparation of the VET provision to the needs of war time and post-war reconstruction, but also development of the VET system and provision in line with the requirements of the EU accession (reforms of EU candidate country). For example, the implemented EU4Skills program funded by the EU and the member states Germany, Finland, Poland, and Estonia aims to support the implementation of vocational education reform in Ukraine. This program is implemented by GIZ and other institutions of partner countries within the framework of co-financing. Despite of these impediments caused by the war, this programme together with the policy makers and stakeholders from Ukraine prepared "Conceptual foundations for the development of human capital in the field of vocational education and training". This strategic document approved by the decision of the Board of the Ministry of Education and Science of Ukraine in December 2022 determinates key directions of the VET reform until 2027 around three priorities: modernization of the content of education, strengthening of institutions and mechanisms of their activity, and reconstruction of the educational infrastructure. The modernization of the content of education involves the improvement of the national system of qualifications, the introduction of independent assessment of educational results and the digitization of the field, such as the development of different online VET sources and platforms established by the state and private investors and the development of digital skills of students. Improving the institutional capacity of vocational education institutions involves strengthening of the institution's autonomy, that is, the creation of a more open model of vocational education management with the active involvement of employers, the community, and other stakeholders. It is also planned to improve the financial legislation of professional education and the development of competence and skills of managers and teachers of vocational schools. "Smart reconstruction" is the restoration of vocational education institutions for the training of professional workers who meet the needs of the labor market. Within this direction, it is planned to create a more optimal and durable network of professional education institutions with new educational spaces. Within the framework of the EU Program "EU4Skills: Best skills for modern Ukraine" a number of trainings were held for teaching staff of the VET schools, namely: "Self-management", "Creative thinking", "Prevention of professional burnout, stress management", "Emotional burnout: building resilience and sustainability", "Information security during martial law", "Conflict management", "Effective

negotiations". In total, more than 300 people were involved in these trainings. Also, 150 English language teachers at VET schools completed training in teaching methods.

Quality of practical training in VET was decreased due to the Covid-19 impact and war and it is big issue in regard general decline of business activities in almost all economic sectors. Employers are surviving and employability has increased, but due to the war it is difficult to arrange practical training part of the VET curricula.

Implications of the war for the development of the system of qualifications

In analysing the implications of the war for the VET provision it is not possible to ignore the resulting changes and adjustments of the skill ecosystem of this country. Perspective of skill ecosystem is highly relevant here, because it enables to take into consideration the implications of the war for the institutions, processes and socioeconomic context of skill formation, to consider implied systemic changes in the labour market, national system of qualifications and VET (Buchanan Anderson Power 2017). In this context the national system of qualifications is one of the central elements of skill ecosystem playing role of bridge between the supply and demand side (education and labour market). The national system of qualifications of Ukraine has had to adjust to the changing demand of qualifications in the labour market and changing supply of qualifications in the impacted systems of VET and HE. This system still contains post-soviet 'qualification characteristics' and grades (Melnik 2022). The state classifier of occupations will have to be reformed and updated according to the post-war structure of the Ukrainian labor market. The war also brought other, far bigger challenges to the Ukrainian qualification system.

According to the ILO (2022) about 4.8 million jobs (around 30 per cent of employment) has been lost due to the war (ILO, 2022). It is estimated that with the continuation of the war up to 7 million jobs can be lost, or 43.5 per cent of the total employment. War also led to the loss of the workforce, as 2.72 million of war refugees are people of working age, 43.5 percent of them were working before the war and 87 per cent were working in full-time jobs, two thirds have tertiary education (ILO, 2022).

Fast growth of unemployment just after the launch of the military aggression was caused by the destructions and displacements of businesses and employees. The war also made significant change in the demand of qualifications. For example, the reduced demand of qualifications was caused by important decreases of production and employment in the sectors, which enterprises were concentrated in the occupied zones (metallurgy and machinery production, coal mining located in the currently occupied regions in the Eastern part of the country), or where activities were reduced by the direct impact of war

like reduction of agricultural production due to contamination of land with mines and bombs (Melnyk 2022). On the contrary, energy sector demands more skilled workforce to deal with the challenges of reconstruction after massive attacks on energy infrastructure. Qualifications of skilled industrial and construction workers are in high demand, as well as of professionals with higher education and higher professional qualifications (teachers, pharmacists, general practitioner-family doctors, educators, inspectors, engineers, economists, practical psychologists), equipment maintenance and operation workers (drivers, gas station operators, turners, tractor operators, machine operators, excavator operators, forklift drivers, machine operators with software control, milling operators, crane operators) (Melnyk 2022; Kuzyo 2023; GrowHow.in.ua 2023). During the war, the demand for workers in the financial and insurance spheres, in construction, and in the hotel and restaurant business decreased significantly. In addition, there is practically no demand in air transport, tourism, leisure and entertainment.

The greatest need for personnel was formed in those industries and spheres of economic activity which are critical in wartime, for example, in the fields of industrial production (especially military related sectors), transport and logistics, healthcare and pharmaceuticals, which are important for both military and civilian needs (Melnyk 2022; Kuzyo 2023). Demand of skilled workforce is also noticed in the labour market sectors least affected by the war, for example, the spheres of trade and catering. In some cases, businesses managed quickly to transform and adapt activities to the war conditions by digitizing of technological processes, more flexible forms of personnel work organization (in particular, the transfer of employees to a remote form of work), for example in the fields of IT, finance and audit also feel the need of skilled staff (Kuzyo 2023; GrowHow.in.ua 2023). Implemented under the Covid-19 managerial systems and tools (planning workload, meetings etc.) were also successfully realized under the circumstances of war.

What regards policies and strategies of the national system of qualifications, disruptions of pandemics and war have not caused derailing effects in this area. The volumes and rates of development of relevant occupational and educational standards and programs remain the same in comparison with the pre-pandemic and pre-war periods. During 2022–2023, 38 state VET standards were approved, including 29 in 2022, and 9 – in 2023 (Ministry of Education and Science of Ukraine 2022; 2023). One of the key changes in the field of qualifications, brought by our analysed disruptions, especially by the war, has been increased provision of partial, or micro-qualifications. There have been also rapidly established qualifications centres for recognition of different VET qualifications gained outside formal education. 34 sectoral qualification centres were established in the different sectors and without any financial support from the state budget.

Covid-19 pandemic and the war did not derail the legal implementation and development of the National System of Qualifications in Ukraine. For example, on the 1st of April

2022 there has been accepted the Law of Ukraine "On Amendments to Certain Legislative Acts of Ukraine Regarding the Functioning of the National Qualifications System" No. 2179-IX (Verkhovna Rada of Ukraine 2022). This Law does not aim at comprehensive regulation of the National System of Qualifications, but at regulating certain aspects of its functioning. It introduces micro-qualifications into the normative field, seeks to link occupational standards with the wage system, amends the functions of the National Qualifications Agency, introduces simplified procedures in the awarding of learning outcomes and qualifications through fast confirmation of the applicant's existing qualification level and the provision of employment opportunities, stipulates the activities of industry councils for the development of occupational standards. There could be noticed some impact of the disruption of pandemics for the attempts to liberalise and flexibilise the processes and procedures of design and awarding of qualifications in this legal act. These provisions would become even more necessary after the start of the war in February 2022. Of course, implementation and realisation of these legal provisions in the institutional practice of the national system of qualifications has been strongly compromised by the lack of capacities and resources of institutions (especially new institutions, such as National Qualifications Agency and industry councils) facing the challenges and deprivations brought by the war.

Besides, becoming of Ukraine a candidate country of the EU has fostered the processes of comparison and referencing of the Ukraine's National Qualifications Framework to the EQF, leading to the publication of the 'Comparison report of the European Qualifications Framework and the Ukrainian National Qualifications Framework' in February 2023 (European Commission 2023).

The introduced micro-qualifications are implemented in the system of education and training through free short-term courses for the adult population, in particular forcibly displaced persons, permitting them to obtain partial VET qualifications. The development of tailor-made training courses oriented on partial qualifications has become possible via amendments of the normative regulation from 2013 on the VET school level. VET providers are eligible to make entrance control of applicants and create partial-qualification programs on basis of accredited full programs. The Covid-19 and the war have stimulated searching new market-oriented mechanisms for earning revenue. More than 1,000 people have already completed such training, 30% of which are employed according to obtained partial qualification. In the organization of such courses, VET schools, in particular, are assisted by international partners in the purchase of consumables, payment of wages to VET teachers and workplace trainers, etc. Seven textbooks for VET schools with a total circulation of 167,000 copies were printed, namely: "Electrical materials science", "Fundamentals of safe work", "Technology of sheet metal works", "Grain harvesters", "Mining and tunnelling machines and

complexes" ", "Basics of information technologies", "Basics of economic knowledge" (State Scientific Institution Institute of Educational Analytics 2023).

Conclusions

Education and skill formation in Ukraine in the recent years have been significantly impacted both by the Covid-19 pandemics and by the military aggression of the Russian Federation. This double impact has had significant and specific repercussions for the institutional and processual development of skill formation, VET and qualifications in Ukraine. Despite the harmful impact of Covid-19 on the Ukrainian VET, it has also created the potential for VET providers to face the subsequent war challenges.

There can be presumed that the war further contributed to the sharpening traditional transitional problems in VET, the deterioration of the quality of VET provision brought by the Covid-19 by bringing in new negative factors and further expanding the ones brought by Covid-19. Significant differences of this disruption from Covid-19 closure have been loss or damage of the part of infrastructure of VET, as well as loss or dispersion of the part of learners and teaching staff for the different reasons. One of the key implications of the war was further disruption of the normal face to face educational process by rearranging it to the remote format or blended format, depending on the situation in the region. The dynamic shifts in the whole structure of the national economy have led to the reconsidering of the whole structure of the Ukrainian labour market and tasks of the skilled workforce formation.

Among the tools for dealing with the implications of the pandemic for VET, which were used during the war period the organizational transition to distance learning has been of critical importance. Here the organizational and methodical experience gained during Covid-19 closure by the VET providers and stakeholders as well as their developed solutions were highly useful. Transition to the online training during the war further led to simplification of the content and methods of learning, as well as digitalization of educational content. Additionally, the martial law conditions significantly contributed to the expansion of the continuing training provision in the initial VET establishments and strengthened regional orientation of the VET provision referring to the concrete skills needs in the regions and sectors of economy. The state responded to these challenges by reduced bureaucratization and state control of the VET provision and further implementing the policy of decentralization launched before the disruptions of Covid-19 and the war.

Tuning the economy to the wartime needs and adaptation of the sectors of economy to the constraints of war change the demand of skills in many sectors of economy, what

fosters flexibilization of the design of qualifications (implementation of partial or micro-qualifications) and training provision processes (development of short-term courses in continuing vocational education and training). In this context the priorities of the policies shift towards fostering autonomy of VET providers and their capacities in the curriculum design and provision of training, enhancing constructive competition on the market of VET provision between the providers and between the formats of the IVET and CVET, investments in the infrastructure of VET provision and teaching staff, especially in work-based learning, according to the regional and sectoral needs of reconstruction, ensuring equal access to the employment in professional areas (all formats, unified value of qualifications without discrimination according to education form) and further strengthening lifelong learning, digitalization and sustainability dimensions of VET provision.

Skill formation and VET will also be strategic factors in the post-war reconstruction of Ukraine. Here the support of the EU and international community to the current reforms of VET and system of qualifications play the strategic role in creating capabilities for the sustainable recovery of the Ukrainian society and its significant contribution to the future development of the Central and Eastern European region.

On the basis of this research there can be suggested few recommendations on the further steps in strengthening the resilience of VET provision during the war and fostering its readiness for the post-war reconstruction. With the continuation of war there is a need of further simplification of obtaining vocational qualifications, educational programs, procedures, standards, tools and other mechanisms of training, retraining and advanced training of citizens who already have educational and professional qualifications (adult population). The benchmark should be a 2-5-times reduction in training duration, which can be achieved through recognition of previous work experience (results of non-formal education and informal training), training for partial (most in-demand) qualifications.

It is necessary to temporarily cancel the regulatory norms regarding the licensing and accreditation of the relevant educational programs, any inspections by the controlling authorities, as well as temporary suspension of activities for a certain VET quality control and inspection institutions. To ensure better fit of the offer of VET to the needs of economy and state under martial law, the practice of forming a regional order for the initial and continuing vocational training of all forms and types should be further disseminated, by actively involving enterprises, VET schools, vocational training centres of the State Employment Service and other stakeholders. What regards qualifications and VET curricula, the expansion of provision of the micro-credentials and micro-qualifications is a clear priority.

What regards the preparation of the VET provision for the post-war reconstruction, the Europeanization can be regarded as a key factor ensuring needed institutional, human, and methodological capacities of the VET system for this challenge. It will require not

only to ensure compliance of the VET provision and qualifications to the requirements of the EU accession, but also to make the Ukrainian VET system really open for the creative and mutually beneficial partnerships with the EU counterparts in creating effective and sustainable institutional settings for the formation of human capital needed for the post-war reconstruction, including opening the possibilities for the VET providers from the EU to operate in Ukraine by opening of their branches, subsidiaries, creating international consortia and clusters.

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