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Development of the Vocational Education and Training System in Extreme Conditions: The Case of Ukraine

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Abstract

Context: The aim of the research is to analyze the state of the national labour market in Ukraine, including the alignment of the volume and sectors of workforce training with labour demand and supply at international, national, regional, and local levels, as well as the impact of labour migration flows and volumes. In Ukraine, this issue is further complicated by the aftermath of the pandemic, long-standing challenges related to employment and qualifications, and the new realities brought about by military aggression from a neighboring authoritarian regime in Russia. The research was significantly constrained by the lack of official statistical data – due both to the impossibility of data collection under war conditions and to the classified nature of many indicators.

Approach: The methodological basis of the research involved a comprehensive analysis of all available sources, including relevant international and national publications, operational data from the State Employment Service, and estimates of labour demand and supply by occupation, qualification, and region. In-depth sociological surveys and structured interviews were conducted with key stakeholders – leading employers, providers of educational services, representatives of central and regional authorities, and social partners at national and regional levels.

Findings: Despite significant and ongoing losses to the country, economy, and population, the research reveals emerging positive trends starting from 2023 across employment, the labour market, and the fields of education and qualifications. The survey results indicate a growing awareness among stakeholders – employers, education providers, and policymakers – regarding the importance of aligning interests in the labour market. Notable developments include improvements in vocational training, recognition of the need for more flexible and modern educational approaches, and a shift toward systemic transformation in adult learning and reskilling.

Conclusions: Key recommendations include harmonizing the National Qualifications Framework with best EU practices; consolidating educational institutions into clusters, corporate universities, hubs, and international centres; abandoning outdated and bureaucratic models in education content and delivery; and creating an independent, transparent system for assessing the quality of educational services and the recognition of professional qualifications. The results of the study are proposed for use in drafting legislative, regulatory, and methodological initiatives, as well as launching targeted awareness campaigns among key decision-makers.

Keywords

vocational education and training system, VET institutions, labour market of Ukraine, VET stakeholders

1 Introduction

Recent history shows that, unfortunately, no one is safe from natural (climate changes, earthquakes, other disasters), social (sudden massive increase in the number of refugees, migrants and displaced persons) and political (civil wars, conquests, liberation wars and conflicts) cataclysms. The example of Ukraine is a clear confirmation of that fact.

Emergency events (often completely unexpected) have a profound and destructive impact on the government, population, and economy of a country in general, and on most institutional components and processes in particular. This fully applies to the labour market and the professional training for employment. It should be noted that the research of the theoretical aspects of the impact of war on society and the main spheres of its life included mainly ancient and older military conflicts and their areas of influence. These general considerations of the nature and extent of the impact appear and are perceived to be quite convincing.

2 Literature Review

A significant body of academic literature explores the effects of warfare on employment, education, and institutional systems. While some studies focus on the Balkan conflicts of the 1990s (Wilmer, 2004), the majority examine guerrilla warfare in South America and armed conflicts across various African regions (Kapferer & Bertelsen, 2009). The theoretical implications of the United States' "war on terror" following the attacks of 11 September 2001 have also been widely discussed (Curtis, 2006). Among the most comprehensive contributions to this discourse is the seminal three-volume history of the Second World War, particularly its third volume (Dembitskyi et al., 2022; Geier & Tooze, 2015).

Nevertheless, the conceptual frameworks and empirical findings derived from these cases are of limited applicability to the context of Russia's full-scale military aggression against Ukraine, particularly in terms of understanding the adaptation of Ukraine's employment and vocational education systems to wartime realities. In this regard, the experience of Israel appears to be the most relevant comparative example. As analyzed by the Observatory of Democracy, Israel's education system – spanning from early childhood to higher education – is deeply integrated into national security strategy. It functions as a foundational non-military component, aiming to build civic, intellectual, and military resilience in the face of ongoing existential threats.

Within the Ukrainian academic context, research on the adaptation of the labour market and educational services – particularly vocational education and training (VET) – to the conditions of martial law and the COVID-19 pandemic includes a number of contributions by the author in collaboration with the Institute of Educational Analytics under the Ministry of Education and Science (Melnyk, 2022, 2023, 2024; Melnyk et al., 2023; Tütlys et al., 2021).

Since Ukraine's independence, the VET sector has experienced profound – and often unpopular – reforms associated with the transition from a planned to a market-based economy. These reforms entailed substantial restructuring of legal, financial, institutional, and methodological frameworks. Between 1991 and 2021, the number of VET institutions declined from 1,246 to 711 (a 43% reduction), while the number of enrolled students fell from 643,400 to 246,900 – a 2.6-fold decrease. Annual first-year enrolment shrank from 377,400 in 1991 to 127,900 in 2020.

The full-scale invasion of Ukraine by the Russian Federation in February 2022 has exacerbated existing challenges. As of 1 February 2025, 183 out of 665 functioning VET institutions

(27.9%) had been either severely damaged (171) or completely destroyed (12) (Освіта під загрозою, 2024).

Despite these extraordinary circumstances, Ukraine's labour market, educational providers, institutional leadership, and workforce have demonstrated remarkable resilience. Economic and professional activities have continued across multiple sectors, testifying to the adaptability and determination of the Ukrainian people. Understanding the nature and scope of this resilience, and the conditions that enabled it, formed the core objective of the present study.

This research examines the dynamics of the Ukrainian labour market and vocational education sector under conditions of military conflict. It focuses on the shifting balance between qualification demand and supply, access to vocational education, inclusion of vulnerable groups, and the mechanisms of learner selection and retention. The study was conducted within the framework of the first implementation year of the Horizon Europe project 101132435 – SKILLS4JUSTICE (Topic: HORIZON-CL2-2023-TRANSFORMATIONS-01-03, Skills Partnership for Sustainable and Fair Migration) (SKILLS4JUSTICE, 2024; SKILLS4JUSTICE – Ukraine, 2024).

3 Methods

The methodological framework of this study integrates a wide array of analytical tools and approaches tailored to the unique socio-economic conditions of Ukraine during wartime. Given the profound disruption caused by Russia's full-scale military aggression since 2022, conventional research methodologies had to be adapted to accommodate the extreme volatility of indicators and trends, many of which became obsolete or incomparable with the pre-war period.

The study employed the following research methods:

1. Analysis of available data sources, including both domestic and international sources;
2. Statistical methods, such as comparative, descriptive, and time-series analysis;
3. Sociological methods, including structured interviews, surveys, and focus group discussions.

Standard methodological designs had to be modified due to the bifurcation of Ukraine's development into two distinct phases: pre-2022 and the wartime period. Many pre-war strategies, indicators, and benchmarks were no longer applicable due to drastic declines in GDP, employment, and living standards – in some cases, by one-third to one-half.

The following country-specific adaptations were implemented:

1. Statistical and bibliometric analyses focused on the period from early 2022 to mid-2024.
2. For comparative analysis, such as employment and educational attainment levels, historical data from previous years (but not earlier than 2014) were considered.
3. Labour demand and surplus by sector were determined using an original methodology based on current operational data from the State Employment Service of Ukraine (Melnik, 2024).
4. Four standard international questionnaires were adapted to reflect the Ukrainian wartime context. Adjustments included the redefinition of categories such as labour migrants, refugees, IDPs, and pre-2022 emigrants. Approximately 20-25% of each questionnaire was expanded with additional questions on: the impact of war on workforce development and employability; use of female labour in hazardous conditions; return migration of refugees; enterprise relocation; and the role of digitalization in adapting education and work environments during wartime.

To assess labour market relevance of qualifications, a 17-question instrument was developed and grouped into five thematic blocks. Respondents were selected from 3-5 economic

sectors (e.g., ICT, energy, finance, and healthcare). Criteria included company size (SMEs, digital/freelance enterprises), market position (industry leaders, major labour consumers), and regional coverage or decentralized structures.

A separate 19-question tool was developed for educational service providers, grouped into seven thematic blocks. Selection criteria for higher education institutions included diversity in type (e.g., national, municipal, private), breadth of academic programs, regional representation, and faculty-level respondents. For vocational training institutions, the focus was on multidisciplinary programs, relevance to regional economic needs, and institutional reputation among learners and employers.

A broad range of national and regional policymakers and labour market intermediaries were surveyed, with attention to education, employment, migration policy, and stakeholder coordination. The total sample included 76 experts:

- 22 company representatives from five key sectors: manufacturing (12), ICT (5), utilities (3), and financial services (2). Notably, manufacturing and ICT accounted for 77.2% of enterprise respondents.
- 12 educational institutions: six universities and six vocational schools/colleges.
- 14 policy stakeholders and social partners: seven from each group.
- Additionally, 35 enterprise-level stakeholders were interviewed to explore digitalization in work and adult learning contexts, especially during crisis conditions such as war and pandemic.

This comprehensive methodological framework provided a robust foundation for analysing the current state of Ukraine's labour market and qualification system in times of war, and for identifying strategic pathways for resilience and transformation.

4 Results

The sociological survey and expert interviews revealed several important findings regarding the state of the labour market, vocational and higher education systems, and the impact of war-related disruptions on employment and training in Ukraine.

Employers generally reported a sufficient supply of labour in certain qualification areas, which, under the current wartime circumstances, can be considered a relatively positive development. However, at least 53 occupations are currently in shortage, and this trend is evident across all sectors of economic activity, not only within enterprises. Regional labour markets experience considerable difficulties in attracting qualified workers for a wide range of positions, particularly those requiring on-site presence and rapid recruitment. While some regional education systems had successfully adapted to changing labour market needs prior to the war, the evacuation and relocation of vocational and higher education institutions due to hostilities have severely undermined this responsiveness. Employers also indicated a persistent need to update training programs and strengthen cooperation with educational institutions to ensure the relevance and applicability of acquired qualifications.

Educational service providers noted that most of their graduates find employment successfully after completing their studies. Curricula and educational standards are regularly reviewed and adapted in accordance with national guidelines, regional economic needs, and labour market fluctuations. Nevertheless, several issues persist. Among these are the lack of unified indicative educational programmes for certain qualifications or professions, difficulties in organising internships under martial law, and insufficient funding for the development of modular or partial qualifications. At the same time, educational institutions reported actively collaborating with local employers and business associations to enhance the relevance of training content.

Such cooperation plays a critical role in improving employment prospects and long-term career development for graduates. The average dropout rate across vocational and higher education institutions over the past five years was reported to be low, ranging between 4.0% and 6.0%.

Experts representing public authorities and social partner organisations at national and regional levels emphasized that the consequences of forced displacement and labour migration caused by the war have created a serious and ongoing challenge for Ukraine's labour market. Current employment policies are largely focused on reintegrating military veterans into the workforce, which enjoys broad societal and institutional support. However, support for other vulnerable or displaced groups remains insufficiently developed. Respondents underscored the growing importance of the National Qualifications Framework (NQF), particularly as it becomes more aligned with international and regional standards. They also stressed the urgent need for reliable, dynamic, and disaggregated labour market statistics. According to these experts, the education system must respond more rapidly and flexibly to the evolving needs of employers, particularly in terms of emerging skills and competencies. Furthermore, they advocated for assigning employers a leading role in the development of professional standards, with active involvement from educational institutions in the co-design of programmes and curricula. In their view, Ukraine's accelerated transition to a system based on professional standards is both justified and achievable.

Regarding the impact of digitalisation, experts noted that the COVID-19 pandemic significantly contributed to a productive shift toward the use of digital tools in the workplace. This transformation has enabled employees to perform work tasks more efficiently, particularly under the severe constraints of wartime. Since the onset of the war, both workers and educators have increasingly adopted and mastered digital technologies, devices, and software solutions. Online learning and remote work have become widespread across all sectors, and the country has witnessed significant progress in the digitalisation of various domains, particularly document management, financial services, online education, and simulation-based assessments.

Finally, the study found that despite the enormous challenges posed by the war, Ukraine's vocational education and training (VET) system has maintained a considerable degree of resilience. As of 1 September 2024, the number of VET institutions had declined only slightly, from 694 in 2021 to 655 institutions, representing a decrease of 5.4%. During the same period, student enrolment dropped by 24,500 individuals, or 9.1% (from 243,820 to 219,320), while the number of personnel employed in the VET sector fell by 2,900 persons, or 9.2% (from 31,460 to 28,560). These figures suggest that, despite notable reductions, the VET system has retained its core capacity to function and contribute to national socio-economic recovery.

Several key factors explain the relative stability and resilience of Ukraine's VET system, despite the destruction or damage of nearly one-third of vocational institutions due to the ongoing war. One of the primary drivers was the rapid adaptation of national legislation at the onset of the full-scale invasion, which enabled individuals to access budget-funded vocational education and training multiple times throughout their lives.

Another contributing factor was the extensive experience that both instructors and students had gained in remote learning during the COVID-19 pandemic. This facilitated the swift transition to distance and hybrid learning models. Additionally, the growing interest among men in vocational education – motivated by the opportunity to obtain deferrals from military mobilisation – further boosted enrolment. This trend was particularly pronounced among those with previous experience in industrial work.

Labour market dynamics also played a critical role. Employers, especially in the defence sector, demonstrated high demand and offered competitive wages for workers in shortage occupations. This demand stimulated interest in vocational programmes directly aligned with labour market needs.

Table 1*Vocational education institutions in Ukraine in 2020-2024: institutions, students, staff*

	Years				
	2020	2021	2022	2023	2024
Dynamics of the number of vocational education and training institutions in Ukraine, 2020-2024 (units)	711	694	670	664	655
Dynamics of the number of vocational education and training students in Ukraine, 2020-2024 (persons)	240701	243825	230474	225194	219327
Dynamics of the number of vet institution staff in Ukraine, 2020-2024 (as of the beginning of the year, persons)	31859	31457	30201	29441	28558

Note. Source: SSI “Institute of Educational Analytics” of the Ministry of Education and Science of Ukraine, official annual administrative reporting.

The decentralisation reform implemented between 2016 and 2020, which transferred most VET institutions under the governance of regional authorities, contributed to institutional flexibility and responsiveness. These institutions became more agile in tailoring programmes to regional labour market demands, introducing new and in-demand training areas, and recognising prior learning – both formal and informal.

Another notable trend is the increasing share of adults among VET graduates. As of September 1, 2024, adults constituted 21.0% of all graduates – nearly double the figure from a decade earlier. Employment rates among graduates remained high, with 76.7% working in jobs related to their field of study.

The relocation of some VET institutions, along with part of their student and staff populations, from frontline areas to safer regions also helped to preserve educational continuity. Furthermore, access to vocational training became more inclusive, supported by coordinated efforts from the state, regional authorities, international partners, and volunteer organisations. Special training programmes were developed for war veterans, persons with disabilities, internally displaced individuals of working age, and other vulnerable groups.

Finally, a growing integration between VET institutions and defence training units has emerged. This includes simplified educational standards, more diverse training formats and equipment, and flexible staffing approaches – though many details of such cooperation remain classified due to wartime restrictions.

The research conducted within the framework of Project 101132435 – SKILLS4JUSTICE, under the Horizon Europe call HORIZON-CL2-2023-TRANSFORMATIONS-01-03 "Skills Partnership for Sustainable and Fair Migration", in particular the sociological survey and expert interviews, allows us to draw several general conclusions:

- The war has significantly accelerated decision-making processes, prompting rapid changes in legislation, training durations, and administrative procedures. The labour market has adapted by prioritising proven and recognised professional skills, short-cycle training formats, and highly motivated individuals – both on the demand and supply sides.
- Simultaneously, the gap between vocational education and training (VET) institutions and the labour market has narrowed substantially. Under such circumstances, the responsibility for decision-making regarding personnel training – at levels 3 to 5 of the NQF/EQF – has effectively shifted toward regional authorities, professional associations, volunteers, and local governance structures. A genuine decentralisation of educational management is taking place.

- Practices developed during the COVID-19 pandemic, including distance learning, simulator-based assessment, access to a wide array of programmes and curricula, and thematic digital content available on educational platforms, have proven to be highly relevant and continue to play a crucial role under wartime conditions.
- Despite the numerous demographic and socio-economic challenges posed by war and displacement, the outflow of labour migrants and refugees has also contributed to easing the pressure on VET institutions and increased competition among applicants. This, in turn, has prompted quality improvements and more targeted educational offerings.
- The demand for professional qualifications has shifted markedly toward skills necessary for the Armed Forces and related support systems, the restoration of war-affected territories (including demining, environmental recovery, housing reconstruction, and infrastructure repair), and social, physical, and psychological rehabilitation of veterans and civilians.
- The private sector – particularly small and medium-sized enterprises established over the past 10-15 years – has demonstrated resilience, adaptability, and flexibility. These businesses have shown the capacity to continue, reorient, or relocate their operations while retaining and recruiting staff under difficult conditions.
- Adult learning – especially its non-formal and informal components – has moved to the forefront of the education and training ecosystem. International partners have played a vital role not only by supporting the rehabilitation of damaged VET infrastructure but also by introducing innovative approaches and training methodologies, particularly for veterans and forcibly displaced adults.
- An important future resource for the development of the VET system in the post-war period will be returning refugees who have gained valuable work, teaching, or training experience abroad and who are ready to reintegrate into the national economy.
- Notably, nearly all structural barriers that previously restricted women's access to traditionally male-dominated professions have been dismantled. This is largely due to male mobilisation and subsequent labour shortages, and the shift has been actively supported by the state, employers, and volunteer organisations.

5 Conclusions

The trends outlined above indicate that both the labour market and the vocational education and training (VET) sector in Ukraine are undergoing rapid and flexible transformations in response to wartime challenges. These shifts require continuous adaptation and the application of innovative approaches by employers, employees, and educational institutions alike. In light of the urgent need to align VET with the post-war reconstruction agenda, several key proposals merit attention.

First, there is a pressing need to harmonise the National Qualifications System (NQS) with leading EU models. This includes a comprehensive reform aimed at adopting modern practices in the forecasting, planning, assessment, allocation, and utilisation of qualifications across labour markets.

Second, a strategic consolidation of VET institutions is recommended, based on a cluster model and involving the establishment of corporate universities, educational hubs, and international centres of excellence. Such a structure would enhance institutional resilience, resource efficiency, and quality assurance.

Third, it is essential to move away from outdated and bureaucratic approaches to curriculum design and pedagogy. In both wartime and post-war contexts, particular attention should be given to transforming adult education to make it more responsive, modular, and inclusive.

Fourth, a new, autonomous, and transparent system for internal and external quality assurance must be created. This system should cover the evaluation of educational services and ensure fair and reliable processes for the recognition and awarding of professional qualifications.

Finally, the findings of this study – as well as subsequent research – should be actively incorporated into the development of draft legislation, regulatory frameworks, and methodological guidance. Dissemination through targeted information campaigns and policy dialogue with national stakeholders will be critical to securing the necessary political and institutional support.

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