

Research Article

Theoretical and Methodological Framework for Occupational Safety and Civil Protection Education in Higher Education Under War-Related Risks

Volodymyr Viktorovych Shevchenko* 

Department of Pedagogy, Mykhailo Dragomanov Ukrainian State University, Kyiv, Ukraine

Abstract

The full-scale war in Ukraine has fundamentally transformed the requirements for ensuring the safety of the educational environment and the professional training of higher education students. Under these conditions, occupational safety and civil protection education has become an essential component of developing professional competence, resilience, and preparedness for responding to emergency situations. The study aims to substantiate the theoretical and methodological framework for organising occupational safety and civil protection education for higher education students under war-related risks. The research is based on a comprehensive analysis of contemporary scientific literature, the regulatory framework governing occupational safety, civil protection, and higher education, as well as competence-based, systems, interdisciplinary, risk-oriented, and student-centred approaches. The study identifies the key principles, pedagogical conditions, organisational forms, methods, and digital tools that enhance the effectiveness of occupational safety and civil protection education in higher education institutions operating under wartime conditions. The findings demonstrate that integrating occupational safety and civil protection into the educational process contributes to the development of safety competence, risk awareness, emergency preparedness, decision-making skills in crisis situations, and psychological resilience among higher education students. Particular attention is paid to the implementation of innovative teaching methods, digital learning technologies, simulation-based training, and practical exercises aimed at strengthening students' readiness to respond effectively to military threats and other emergencies. The proposed theoretical and methodological framework may serve as a basis for improving educational programmes, modernising occupational safety and civil protection curricula, and enhancing the quality of professional training in higher education institutions under conditions of increased security challenges.

Keywords

Occupational Safety, Civil Protection, War-related Risks, Risk-oriented Approach, Professional Training, Wartime Education, Resilience

1. Introduction

One of the key priorities of state policy is to ensure the safety of life and health of the population, preserve national potential and protect the environment. The implementation of this task is of particular importance in the context of modern

*Correspondence: Volodymyr Viktorovych Shevchenko (ist-volodymyr@ukr.net)

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security challenges, among which the full-scale war of the Russian Federation against Ukraine occupies a decisive place.

Russia's military aggression has created unprecedented risks to the life and health of citizens, the functioning of critical infrastructure, educational and industrial facilities, and has also caused large-scale social, economic and environmental consequences. Missile and artillery shelling, the use of unmanned aerial vehicles, the destruction of civilian infrastructure, mine danger, man-made accidents and the emergence of emergency situations form a new risk environment in which security issues are gaining strategic importance.

Despite the rapid development of science, engineering and modern technologies, humanity does not have universal mechanisms capable of completely eliminating the threats associated with military conflicts. That is why the formation of a culture of security, preparedness for emergency situations, skills to prevent risks and minimize their consequences in society is of particular relevance. In these conditions, systematic training of the population, in particular higher education students, for safe behavior and effective response to military and emergency threats is of great importance.

In conditions of full-scale war and prolonged military threats, the problem of the safety of the educational process in higher education institutions of Ukraine has acquired a systemic nature. The functioning of universities takes place in circumstances of increased risk to the life and health of participants in the educational process, disruption of the usual work regime, the need for prompt response to air raid sirens, power outages, threats of infrastructure destruction, as well as increased psychological stress on students and scientific and pedagogical workers.

2. Section 1: Occupational Safety System in an Educational Institution

Under such conditions, labor protection and civil protection cease to be only a regulatory and organizational direction of the activity of a higher education institution and appear as an important component of the professional training of applicants, which requires scientifically substantiated updating of the content, forms, methods and means of training.

The relevance of the study is due to the fact that a modern higher education institution must not only ensure compliance with the requirements of legislation in the field of labor protection, life safety and civil protection, but also organize effective training of higher education applicants in actions in emergency situations, form skills of safe behavior in conditions of military risks, readiness to comply with evacuation algorithms, use protective structures, provide first aid, psychologically balanced response to crisis events and a responsible attitude to personal and collective safety. In this context, occupational health and safety and civil protection training should be considered as a holistic pedagogical process aimed

at students acquiring knowledge about hazards, risks and methods of protection, as well as at forming practical readiness to act in non-standard and threatening situations.

Modern scientific works testify to the growing attention to the problem of a safe educational environment, professional training of teachers and students for activities in emergency situations and martial law. In particular, the studies of N. Belyaeva emphasize the preparation of future teachers for the implementation of a safe educational environment and the need to update the content of professional education in accordance with new social challenges [1]. The works of E. Ivashkevych reveal the essence of the culture of safe professional behavior of a teacher, justify the need to form a safety paradigm of the educational process in emergency situations. [2]. Certain aspects of psychological safety, health protection and integration of safety components into the content of education are highlighted in the works of M. Butyrin and V. Butyrin. [3]. At the same time, the analysis of scientific sources gives grounds to assert that, despite the presence of significant developments in the field of a safe educational environment, professional training of teachers and safety culture of participants in the educational process, the problem of organizing training in occupational safety and civil protection for higher education students in conditions of military risks requires further theoretical and methodological understanding.

The need for such understanding is primarily due to the fact that the content of traditional courses on occupational safety, life safety and civil protection was in many cases formed in other social conditions and does not fully take into account the realities of martial law. [5]

3. Section 2: Preparedness and Response to Hazards in the Educational Process

Today, a higher education student must be prepared not only to comply with general safety requirements in the educational environment, but also to act in the event of missile danger, artillery shelling, prolonged stay in shelter, disruption of communications, fires, man-made accidents, information threats and psychologically stressful situations. [4]

Accordingly, the organization of training in labor protection and civil defense must take into account military-related risks, the specifics of blended and distance learning, the need for algorithmization of safe behavior, as well as the need to combine theoretical training with practical training. In the context of the theory and methodology of training, the definition of the content of such training, the selection of effective forms and methods of work, and the justification of pedagogical conditions for the formation of safety knowledge, skills and abilities of higher education students are of particular importance. [6] It is not only about familiarizing yourself with the regulatory and legal foundations of labor protection and civil defense, but also about practicing algorithms for actions during emergencies, developing skills in risk assessment, decision-

making in crisis situations, team interaction, using protective equipment, providing first aid, and maintaining psycho-emotional stability in dangerous conditions. That is why the organization of labor protection and civil defense training in a higher education institution should be based on competency-oriented, practice-oriented and risk-oriented approaches. [7] Given the specifics of military risks, it is advisable to consider the structure of labor protection and civil defense training as a multi-component system that includes cognitive, activity-practical, value-motivational and reflective components. [8]

The cognitive component involves the acquisition by students of knowledge about dangerous and harmful factors of the educational environment, legal principles of labor protection, tasks of civil defense, rules of behavior during emergencies.

The activity-practical component is associated with the formation of skills to act according to instructions and safety algorithms, use personal protective equipment, navigate in shelter, perform evacuation measures, and provide first aid.

The value-motivational component reflects the awareness of the importance of safety as a personal and professional value, and the reflective component reflects the ability to analyze one's own actions, assess the level of readiness to respond to dangers and correct safe behavior. [9]

The issue of improving the quality of professional training of pedagogical personnel is one of the priority tasks of the modern education system of Ukraine. The level of professional competence of the teacher, his readiness to act in conditions of uncertainty, risk and rapid social transformations largely depends not only on the quality of the educational process, but also on the formation of a safe, responsible and competent personality of the student. This problem acquires particular importance in the conditions of the full-scale war of the Russian Federation against Ukraine, which has radically changed the requirements for the organization of the educational environment and the professional activities of pedagogical workers.

A modern teacher works in conditions of combining traditional educational tasks with new challenges associated with military risks, man-made threats, mine danger, the possibility of missile and drone attacks, disruption of infrastructure, the emergence of emergency situations and the need to ensure the continuity of the educational process. Under such circumstances, the professional competence of a teacher can no longer be limited exclusively to subject, psychological-pedagogical or methodological knowledge. An important component of his professional readiness should be a formed culture of safety, the ability to assess potential risks, prevent dangerous situations and act correctly in the event of their occurrence. [10]

Along with military threats, the transformation of requirements for the teaching profession is caused by globalization processes, digitalization, the rapid development of information and production technologies, automation and technologization of social production. The transition to a new

technological system changes the nature of work, the structure of professional competencies and the requirements for safe human activity. The use of modern equipment, electrical systems, digital tools, automated technological complexes and information resources simultaneously expands the capabilities of the educational process and creates new potential risks. Therefore, the training of a future teacher should include not only mastering modern technologies, but also understanding the principles of their safe use.

In this context, the training of pedagogical personnel to organize a safe educational environment and ensure labor protection for all participants in the educational process is of particular importance. A teacher must be able not only to comply with the established safety requirements in his own professional activities, but also to systematically form in students the appropriate knowledge, skills, abilities and value attitude towards safety. This involves awareness of potential dangers, understanding the causes of risks, the ability to predict their consequences, correctly use protective equipment and act in accordance with established algorithms in dangerous and emergency situations.

This problem becomes particularly relevant during the professional training of future teachers of technology, since the specifics of their activities are directly related to the use of various equipment, tools, materials, electrical installations and technological processes. During practical and laboratory classes, the teacher must simultaneously ensure the achievement of educational results and monitor compliance with the requirements of labor protection, industrial sanitation, fire safety and safe handling of equipment. The prevention of injuries and the formation of a stable model of safe behavior in students largely depend on his professional preparedness.

It is also important to consider that in wartime, the concept of safety in the educational process becomes complex. It covers not only traditional issues of occupational health and safety, but also readiness to act during air raids, shelling, fires, man-made accidents, detection of explosive objects and other emergencies. Therefore, a modern teacher must possess not only professional and methodological competencies, but also practical skills in organizing safe behavior of students in conditions of increased risks.

At the same time, an important component of a teacher's professional training is the formation of a responsible attitude in students to their own lives and the health and safety of other people. When introducing young people to modern technologies, a teacher should focus not only on their functionality and practical application, but also on potential dangers that may arise during their use. This approach contributes to the formation of conscious behavior, responsibility for one's own actions, the ability to assess risks and make informed decisions in specific production and life situations. [11]

In this regard, the traditional model of teaching occupational safety, which is mainly based on the assimilation of regulatory provisions and theoretical knowledge, needs

further improvement. Modern training of future teachers should be practice-oriented, situational and as close as possible to the real conditions of professional activity.

It is advisable to use problem-based learning, modeling of dangerous situations, analysis of real production and emergency cases, practical training, digital simulations and interactive technologies. [12] This allows not only to master regulatory requirements, but also to form a readiness to apply them in specific conditions.

The relationship between occupational safety training and modern production also requires special attention. The educational process should reflect real changes in the field of labor, the introduction of new technologies, automation of production processes, the use of digital management systems and corresponding changes in the structure of professional risks. This approach ensures the relevance of the content of training and contributes to the formation of the ability of future teachers to transfer the acquired knowledge into practical professional activities. [13]

Thus, modern social, technological and security challenges, primarily the full-scale war of the Russian Federation against Ukraine, necessitate a rethinking of the content of professional training of pedagogical personnel. Occupational health and safety, safety techniques, and emergency preparedness should not be considered as secondary elements of professional education, but as integral components of the professional competence of a modern teacher. [14] This highlights the need to develop and scientifically substantiate new methodological approaches, update the content of educational components, introduce innovative teaching technologies, and strengthen the practical orientation of training future teachers for safe professional activity in conditions of war and peace challenges. [15]

The effectiveness of organizing such training largely depends on the use of modern methodological tools. Martial law conditions require a combination of traditional forms of education with interactive and practice-oriented methods, among which situational analysis, emergency modeling, case method, trainings, practical classes on evacuation and first aid, and the use of digital platforms for working out safe behavior algorithms are of particular value. At the same time, the content of the education should be adapted to the profile of the applicants' training, the specifics of the higher education institution, regional security risks, and the real possibilities of the educational environment.

4. Conclusions

Therefore, in conditions of war risks, training in labor protection and civil defense in a higher education institution should be considered as a purposeful theoretical and methodological process, focused on the formation of knowledge, skills, abilities and models of safe behavior in higher education students, necessary for preserving life and health and ensuring the continuity of the educational process

in crisis conditions.

The analysis conducted gives grounds to assert that the modern system of training higher education students should take into account a qualitative change in the nature of security threats, caused by the full-scale war of the Russian Federation against Ukraine. Military operations, missile and drone attacks, fires, destruction of infrastructure, mine danger, man-made accidents and other emergencies form fundamentally new requirements for the readiness of participants in the educational process to act in conditions of increased risk. Under such circumstances, knowledge of labor protection and civil defense acquires not only professional, but also direct life-supporting significance.

It is substantiated that the effectiveness of such training largely depends on its integration with the professional training of future specialists. The content of educational components should be oriented not only to the assimilation of regulatory requirements and theoretical provisions, but also to the formation of practical readiness to predict dangers, assess risks, make safe decisions and organize one's own behavior and the behavior of other people in emergency situations. Of particular importance is the approximation of training situations to real conditions of professional activity, which makes it possible to ensure the practical orientation of training.

An important result of professional training should be the formed culture of safety as an integral characteristic of the personality of a higher education applicant. It involves not only possession of relevant knowledge and practical skills, but also awareness of personal responsibility for one's own safety, life and health of other people, compliance with established rules, readiness to prevent dangerous situations and responsible response to their occurrence. It is this approach that allows us to move from formal assimilation of safety requirements to their conscious application in professional and everyday activities.

In the context of training future teachers, their ability to form a safe educational environment and an appropriate culture of behavior of students in their further professional activities is of particular importance. A teacher must be not only a carrier of relevant knowledge, but also an organizer of safe activities, able to timely identify potential dangers, carry out preventive work, ensure compliance with labor protection requirements and organize the actions of participants in the educational process in the event of an emergency. This is especially important during technological and practical training, where the use of equipment, tools, materials and modern production technologies is accompanied by potential professional risks.

At the same time, modern training in labor protection and civil protection must take into account the processes of digitalization and technologization of the educational and production environment. The use of digital platforms, multimedia tools, virtual simulations, interactive scenarios and emergency modeling technologies creates additional opportunities for the formation of practical competencies.

Such tools make it possible to reproduce dangerous situations without a real risk to the life and health of applicants, to model action algorithms and evaluate the correctness of the decisions made.

An important condition for the effectiveness of training is the systematic combination of theoretical, practical, training and situation-oriented components of training. The assimilation of regulatory provisions should be supplemented by the analysis of specific dangerous situations, practical exercises, algorithms of actions during an air alarm, fire, man-made accident, detection of suspicious or explosive objects, disruption of infrastructure and other crisis events. Such an organization of training contributes to the transition from declarative knowledge of the rules to the formed readiness to act in accordance with them.

Ensuring the interdisciplinary nature of training is no less important. It is advisable to integrate the issues of labor protection and civil protection with professional, natural, technical, information, psychological and pedagogical and other educational components. Such integration allows us to consider safety not as an isolated educational problem, but as a systemic characteristic of the professional activity of a modern specialist.

Therefore, improving the methodology of training in labor protection and civil protection should include updating the content of education in accordance with modern military, technological and production risks; applying practice-oriented and interactive methods; using digital technologies and modeling tools; strengthening the training component; integrating knowledge from different industries; and creating pedagogical conditions for the formation of sustainable motivation for safe behavior.

Thus, the training of higher education students in occupational safety and civil protection in modern conditions should be aimed at forming not only a set of normative knowledge, but also a holistic readiness of the individual for safe life and professional activity. Its final result should be the ability of the student to independently assess risks, predict possible consequences of dangerous events, act in accordance with certain algorithms, use means of individual and collective protection, provide necessary assistance and organize safe interaction with other participants in the educational and production environment.

The relevance of the outlined problem, its interdisciplinary nature and insufficient development of individual methodological aspects determine the need for further scientific substantiation of the content, forms, methods and pedagogical conditions for organizing the training of higher education students in occupational safety and civil protection in conditions of military risks. A promising direction for further research is the development of a holistic theoretical and methodological system of such training, the determination of its structural components, criteria and indicators of the formation of security competencies, as well as experimental verification of the effectiveness of the proposed pedagogical

conditions and technologies.

In conclusion, it can be noted that in conditions of a prolonged military threat, the issue of security in the higher education system must move from the plane of formal compliance with established requirements to the level of systematic training of an individual capable of acting responsibly, competently and effectively in conditions of uncertainty and danger. It is this approach that meets the modern social needs of Ukraine and creates the basis for the formation of a specialist who is ready not only to professionally perform his functions, but also to ensure the safe organization of activities, the preservation of people's lives and health, and the stability of the educational environment in conditions of war and peace challenges.

Author Contributions

Volodymyr Viktorovych Shevchenko: Conceptualization, Data curation, Formal Analysis, Methodology, Resources, Writing – review & editing

Conflicts of Interest

The author declares no conflicts of interest.

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