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DIAGNOSING THE LEVEL OF PROJECT AND TECHNOLOGICAL SKILLS OF FUTURE SPECIALISTS OF THE CIVIL DEFENSE SERVICE FORMATION

Abstract. The essence of project and technological skills in the context of the future specialists of the civil defense service training is described. It was determined that the structure of project and technological skills consists of the ability to: identify a problem, define a task, outline various ways of its implementation, focused on the development and justification of measures to strengthen fire protection, planning preventive measures, etc.; determine the expected result of the educational project aimed at improving the quality of fire prevention, emergency rescue and management activities of the industry; ensure the achievement of the result; to carry out analysis, systematization and generalization of the normative regulation of the industry in the process of working on the implementation of the task of the educational project; monitor the performance of tasks and duties; organize work in a team and involve experts in solving individual issues; to form and provide a moral and psychological climate that contributes to the fulfillment of the tasks of the educational project; carry out effective professional communication; creatively design the result of the educational project and present it using information and communication technologies; objectively evaluate, self-evaluate and mutually evaluate; carry out an examination; to reflect.

It is proposed to determine the level of project and technological skills of future specialists of the civil defense service development in accordance with the
criteria and indicators of the motivational and cognitive components-prerequisites and the operational-active formative component. The criteria for the formation of the specified skills of the future specialists of the civil defense service according to the motivational and cognitive components-prerequisites and the operational-active formative component are respectively defined as: motivational and value, cognitive and operational-active. The levels of design and technological skills formation are defined as elementary, sufficient and high.

**Keywords:** project and technological skills, diagnostic criteria, future specialists of the civil defense service, professional training.

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**ДІАГНОСТУВАННЯ РІВНЯ СФОРМОВАНОСТІ ПРОЄКТНО-ТЕХНОЛОГІЧНИХ УМІНЬ І НАВИЧОК У МАЙБУТНІХ ФАХІВЦІВ СЛУЖБИ ЦИВІЛЬНОГО ЗАХИСТУ**

Анотація. У статті охарактеризовано сутність проєктно-технологічних умінь і навичок у контексті підготовки майбутніх фахівців служби цивільного захисту. Визначено, що структуру проєктно-технологічних умінь і навичок складають уміння: виокремлювати проблему, визначати завдання, окреслювати різноаспектні шляхи його виконання, орієнтовані на розроблення і обґрунтування заходів з посилення протипожежного захисту, планування запобіжних заходів тощо; визначати очікуваний результат навчального проекту, спрямований на підвищення якості пожежно-профілактичної, аварійно-рятувальної і управлінської діяльності галузі; забезпечувати досягнення результату; здійснювати аналіз, систематизацію та узагальнення нормативного регламентування галузі у процесі роботи над виконанням завдання навчального проекту; забезпечувати контроль за виконанням завдань та обов’язків; організовувати роботу в колективі і залучати експертів до вирішення окремих питань; формувати і забезпечувати морально-психологічний клімат, що сприяє виконанню завдань навчального проекту; здійснювати ефективне професійне спілкування; творчо оформлювати результати навчального проекту і презентувати його із застосуванням
інформаційно-комунікаційних технологій; об'єктивно оцінювати, самооцінювати та взаємооцінювати; здійснювати експертизу; рефлексувати.
Запропоновано визначати рівень сформованості проектно-технологічних умінь і навичок у майбутніх фахівців служби цивільного захисту відповідно до критеріїв та показників мотиваційного і когнітивного компонентів-передумов та операційно-діяльнісного формувального компоненту. Критеріями сформованості зазначених умінь і навичок у майбутніх фахівців служби цивільного захисту за мотиваційним і когнітивним компонентами-передумовами та операційно-діяльнісним формувальним компонентом відповідно визначено: мотиваційно-ціннісний, когнітивний і операційно-діяльнісний. Рівнями сформованості проектно-технологічних умінь і навичок визначено початковий, достатній і високий.

Ключові слова: проектно-технологічні уміння і навички, критерії діагностування, майбутні фахівці служби цивільного захисту, професійна підготовка.

**Formulation of the problem.** Rapid global social, economic, political and ecological changes directly or indirectly provoke natural disasters, catastrophes and cataclysms. The events taking place in Ukraine during the last year (russian military aggression against Ukraine) caused large-scale destruction, injury and death of thousands of civilians and soldiers, forced evacuation and internal/external displacement, destruction of fauna and flora, etc. Considering this, the training of highly qualified specialists of the Unified State Civil Defense Service, capable of effective rescue, emergency rescue and other emergency operations under martial law conditions; the organization and application of various systems for the protection of the population and elimination of military actions consequences in settlements and territories affected by the means of destruction is a priority task of the national level.

The ability to identify hazards and their possible sources, to assess the probability of dangerous events occurrence and their consequences; to evaluate technical indicators and determine the condition of emergency and rescue equipment, etc.; to provide safety operation of the gas and smoke defense service; to choose optimal measures and means aimed at reducing professional risk; to analyze the interrelationships between processes in the past and at the present stage, etc. are program results of future specialists of the civil defense service professional training. Achieving the optimal level of project and technological skills development of future specialists of the civil defense service is an urgent problem, which necessitates the selection of correct criteria and tools for diagnosing the level of the specified skills development.

**Analysis of recent research and publication.** Psychological and pedagogical aspects of professional training of future specialists of the civil defense service were

**The goal of the article** is to determine the optimal criteria for diagnosing the level of project and technological skills of future specialists of the civil defense service formation and to characterize their indicators.

**Presentation of the main research material.** According to the main types of future specialists of the civil defense service activities, the skills in the following areas can be distinguished as those of fire-preventive, emergency-rescue and management activities.

The analysis of the educational program for the future specialists of the civil defense service training [6] made it possible to single out the following skills of fire-preventive activity: planning decisions carrying out; the compliance of engineering solutions in buildings and structures with the requirements of fire regulations evaluating; building projects examining, etc.; means of fire protection providing; documents for monitoring compliance according to fire prevention regime drawing up; educational events in order to promote fire prevention knowledge among population organizing; texts on fire safety issues for conducting explanatory work on fire safety rules composing; professional communication carrying out, etc. These skills are mostly aimed at fire prevention measures designing; work planning, its organization and professional communication.

The skills necessary for emergency and rescue activities carrying out are: fire scouting; gas and smoke defense service units safe operation controlling; forces and means managing during fires; rescue operations organizing and conducting; evacuation organizing; height rescue work organizing, etc.; victims transporting; first aid providing, etc. Each of the above listed skills requires obligatory practical training of theoretical knowledge and consolidating the technology of rescue operations performing.

In the field of management activity, the relevant skills are; occupational health and safety managing; briefings on occupational health and safety issues conducting; relevant documentation drawing up; moral and psychological climate in the unit providing that stimulates the performance of professional tasks; factors that lead to the emergence of conflicts in interpersonal communication determining, and the level of their influence reducing; professional communication at the appropriate level carrying out, etc. The managerial skills of future specialists of the civil defense service are mostly aimed at organizing and managing activities, ensuring a favorable
psychological microclimate in the group, eliminating conflict-causing factors and, accordingly, promoting the efficiency of professional activity. The performed analysis actualizes the need to develop design and technological skills of the future specialists of the civil defense service as a component of professional skills.

According to E. Lytvynovskyi [7, p. 112], the skills of diagnosing, forecasting, modelling, structuring, constructing and evaluating are considered to be the components of project and technological skills. In S. Yashchuk’s study, the concept of ‘project and technological skills’ is interpreted as ‘ways of creative and transformative, technical and design activity learned by a person on the basis of acquired knowledge, in accordance with the achieved level of scientific and technical progress’ [8, p. 12]. We interpret the concept of ‘project-technological skills’ as the ability to carry out algorithmized creative project-activity operations in order to achieve a predetermined result.

In the context of the future specialists of the civil defense service training, we consider the following skills to be project and technological:

− the problem identifying, task defining; various ways of its implementation, focused on the development and justification of measures to strengthen fire protection outlining; preventive measures planning, etc.;
− the expected result of the educational project aimed at improving the quality of fire prevention, emergency rescue and management activities of the industry determining; the achievement of the result ensuring;
− the analysis, systematization and generalization of the normative regulation of the industry in the process of working on the implementation of the task of the educational project carrying out;
− the performance of tasks and duties monitoring; the teamwork organizing and experts in solving individual issues involving; to a moral and psychological climate that contributes to the tasks fulfillment providing; effective professional communication carrying out;
− creative result of the educational project designing and its presenting using modern information and communication technologies;
− objectively evaluating, self-evaluating and mutual evaluating; examination carrying out; reflecting.

We consider project and technological skills to be an integrated component of the necessary competencies of the specified specialists.

Naturally, the question about diagnosing the level of design and technological skills of future specialists of the civil defense service development arises. Based on the analysis of scientific sources (N. Briukhanova, V. Martyniuk, V. Nyshcheta, I. Osadchenko, N. Pakhomova, N. Polikhun, N. Samoilenko, V. Titova, A. Tsimbalaru, V. Shapar, S. Yashchuk, etc.) we can conclude that the awareness of existing knowledge should be the prerequisites for the skills formation. That is why
we single out the motivational and cognitive components that are prerequisites for the development of project and technological skills of future specialists of the civil defense service.

Therefore, the determination of the level of project and technological skills of future specialists of the civil defense service development should be carried out in accordance with the criteria and indicators of the motivational and cognitive components-prerequisites and the operational activity formative component. The criteria for the formation of the specified skills of the future specialists of the civil defense service according to the motivational and cognitive components-prerequisites and the operational active formative component are, respectively: motivation and value, cognitive, and operational active.

The motivation and value criterion for diagnosing the level of project and technological skills formation of future specialists of the civil defense service requires the existence of a stable interest in future professional activity, the awareness of its essence and specificity, the awareness of the need to develop project and technological skills, and the desire for self-development and self-improvement.

The indicators of the motivation and value criterion of project and technological skills formation (according to the motivational component - prerequisite) are:

− the awareness by future specialists of the civil defense service of the future professional activity specification as a project-technological one;
− the awareness by the specified specialists of the need to develop project and technological skills and of the development of qualities necessary for the implementation of fire-preventive, emergency-rescue and management activities;
− showing interest in cooperation, initiative and responsibility for decision-making;
− striving for self-development, self-improvement, self-education.

Methods of diagnosing the level of project and technological skills of the future specialists of the civil defense service development according to the motivation and value criterion are observations, conversations, questionnaires with subsequent discussion, answers to motivational and problematic questions, testing, etc.

As knowledge is the basis for the skills formation, we believe it appropriate to single out the cognitive component as a prerequisite. The criterion for the project and technological skills of the future specialists of the civil defense service formation according to this prerequisite component is cognitive, which involves knowledge of the essence of the main concepts and categories of professional training.

Indicators of the level of project and technological skills formation in accordance with the cognitive criterion for the cognitive component-prerequisite are considered to be the correct operation of categories and concepts of general scientific
knowledge (the essence of project and technological skills; the interdependence of the concepts ‘project technology training’, ‘educational project’, ‘project and technological skills’, ‘professional training’, etc.) and specific content (goals and tasks of professional training; the essence of the main concepts and categories of the professional training, etc.).

The methods of diagnosing the level of project and technological skills of future specialists of the civil defense service formation according to the cognitive criterion of the cognitive component-prerequisite are discussions, answers to educational questions, testing, control tasks within the limits of individual educational projects, etc.

As a formative component of project and technological skills, we single out the operational-activity component. The criterion for the formation of project and technological skills according to the formative component is operational-activity, the indicators of which are:

− the quality of actions and operations performance (accurate identification of the problem of the educational project, definition of the task of the educational project and the ways of their implementation, presentation of the material using modern information and communication technologies, logical presentation of the material, establishment of interdisciplinary connections, etc.);
− the speed of actions and operations execution (achieving the planned result of the educational project in the allotted time, etc.);
− the reproducibility in new situations, in particular, close to the conditions of the future professional activity.

Methods of diagnosing the level of project and technological skills of the future specialists of the civil defense service development in accordance with the operational-activity criterion are discussion, observation, testing, questionnaires, performance of control tasks within the limits of individual educational projects, etc.

We emphasize that the specified skills ensure the implementation of the industry standard requirements for the future specialists of the civil defense service training: the performance of design, management, executive, technical functions in the process of applying design and technological skills to solve professional tasks.

Note that L. Kaidalova [9, 5] thinks of the high level signs of abilities and skills formation to be: possessing them at a creative level with the use of analysis, synthesis, modeling and abstraction methods, with awareness of not only the goal, but also the choice of ways to achieve it; possession of knowledge, categories, concepts, methods and techniques that are necessary in research activities and non-standard situations, etc.

So, in accordance with the specified components, criteria and indicators, we distinguish three levels of design and technological skills of the future specialists of the civil defense service formation: elementary, sufficient and high.
The elementary level of project and technological skills of the future specialists of the civil defense service formation is characterized by insufficient or absent awareness of the future professional activity as project and technological, and the need for the project and technological skills formation, little or no interest in cooperation in the process of working on the implementation of an educational project. General scientific and subject-specific knowledge is insufficient for correct operation and establishment of interdependencies of the main categories and concepts of project-based educational technology. The quality and speed of actions and operations performance is unsatisfactory, reproducibility of abilities and skills in new situations is absent or elementary.

The sufficient level of project and technological skills of the future specialists of the civil defense service formation implies sufficient awareness of future professional activity as project and technological and the need for the project and technological skills formation necessary for the implementation of fire prevention, emergency rescue and management activities, which encourages interest in cooperation in the process of working on the implementation of an educational project, identifying initiative and responsibility for decision-making. The amount of acquired knowledge of a general scientific and subject-specific nature allows correctly operating and establishing the interdependence of categories and concepts of project-based educational technology and future professional activity. The quality and speed of actions and operations are satisfactory, partial reproducibility of abilities and skills in new situations, in particular, close to the conditions of future professional activity.

The high level of project and technological skills of the future specialists of the civil defense service formation is characterized by a stable awareness by future specialists of the civil defense service of the future professional activity as a project and technological activity and the need for the formation of project and technological skills necessary for the implementation of fire-preventive, emergency-rescue and management activities; actively showing interest in cooperation, initiative and responsibility for decision-making in the process of an educational project implementation; high desire for self-development, self-improvement, self-education. The amount of acquired knowledge of a general scientific, subject-specific nature allows correctly operating and establishing the interdependence of categories and concepts of project-based educational technology and future professional activity. The high quality and speed of actions and operations ensures the reproducibility of skills in new situations, in particular, close to the conditions of future professional activity.

Thus, diagnosing the level of project and technological skills of future specialists of the civil defense service development is carried out in accordance with the defined criteria and indicators of the motivational and value, cognitive components-prerequisites and the operational-active formative component.
We adhere to the point that the most successful project and technological skills formation occurs under the conditions of a clear definition of the goal and result of training; understanding the procedure for performing actions aimed at achieving the goal; a clear idea of the final result; the presence of systematic self-control by means of reflection; timely identification of deficiencies in work and making corrections; adequate self-esteem on the way to achieving a defined goal.

Taking into account the above mentioned, there is a need to conceptually create a special educational environment, favorable for the project and technological skills formation in the process of the future specialists of the civil defense service training, based on the content of these specialists training, the specifics of future professional activity and the need for the project and technological skills formation.

**Conclusions.** Thus, as a result of scientific sources analysis, we specified that project and technological skills are the ability to carry out algorithmized project activity operations aimed to creatively achieving a result. Components of project and technological skills are the following: problem singling out, task defining, various ways of its implementation outlining, focused on the development and substantiation of measures to strengthen fire protection, preventive measures planning, etc.; the expected result of the educational project aimed at improving the quality of fire prevention, emergency rescue and management activities of the industry determining; the achievement of the result ensuring; analysis, systematization and generalization of the normative regulation of the industry in the process of working on the implementation of the task of the educational project carrying out; the performance of tasks and duties monitoring; teamwork organizing and experts in solving individual issues involving; moral and psychological climate that contributes to the fulfillment of the tasks of the educational project providing; effective professional communication carrying out; the result of the educational project creative designing and its presenting with the usage of modern information and communication technologies; objectively evaluating, self-evaluating and mutual evaluating; examination carrying out; reflecting.

Diagnosing the level of project and technological skills development is carried out in accordance with criteria and indicators for motivation and value, cognitive components-prerequisites and an operational active formative component. The levels of project and technological skills formation are defined as elementary, sufficient and high.

The development of a model of professional training of the specialists with the use of project-based educational technology is regarded as prospects for our further scientific research.

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