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IMPLEMENTATION OF PROJECT-BASED LEARNING TECHNOLOGY WITHIN THE EDUCATIONAL PROCESS OF HIGHER MILITARY INSTITUTIONS

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The article defines the category of project-based learning. It is an efficient pedagogical technology, oriented towards integration of theoretical knowledge from the different spheres of science, formation of professional skills, development of creativity, critical thinking, communication, leadership and decision-making. Also, project-based learning is a productive searching activity of cadets that is organized by an instructor to solve particular cognitive and practical tasks that is closely connected with future professional activity of learners.

We found that project-based learning technology is an important component of professional training of future military officers and it gives the possibility to use the person-centered approach, activate independent work and enhance cadets' motivation to future professional activity.

The article investigates the types of projects in details. It is stated, that a number of projects are used, while implementing project-based learning technology during the educational process at the higher military institution. They are the following: construction and practical projects, role-plays and game projects, information and research projects, survey projects, productive projects, organization and creative projects. We have proved that the projects can also be divided into individual, personal, team and pair ones on the basis of participants; number. In addition, the projects can be short-term, middle-term, and long-term because of the duration of the activity.

The authors found that the project learning technology is realized in the four stages at the higher military institution: substantiation stage, searching stage, technological stage, and concluding stage. The article explains the kinds of work for each stage in details.

The notion of didactic conditions was outlined. The authors have proved that these conditions concern reasons and circumstances of realization of the educational process. Didactic conditions contribute to positive results of the process of professional training of future military officers. We decided that didactic conditions for implementation of project-based learning technology within the educational process at the higher military institution can be divided into the four stages: motivation, content, technological, and evaluation conditions. Each of these groups consists of specific didactic conditions, oriented towards the efficiency of project-based learning technology at the higher military institution

Keywords: team work, didactic conditions, future officers, project-based technology, professional skills

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1. Introduction

Good selection of teaching technologies and methods is considered to be one of the most important factors of dynamic professional development of future military officers; and it is the key for the efficiency of military activities as well. New orientations and values of military education require implementation of active and interactive pedagogical technologies as they provide necessary integration of theoretical knowledge from different spheres of science, professional skills, creativity, critical thinking, communication, leadership, and decision-making.

Project-based learning is an innovative approach to learning that teaches a number of strategies necessary for success in the twenty-first century. Learners obtain their training results through inquiry, collaborative work, research, creative tasks, and their knowledge reflection [1].

Project-based learning is determined as productive search activity of cadets that is organized by an instructor to solve the particular cognitive and practical problem. Usually, a project-based learning task results in a creative product and its presentation [2].

2. Literature review

At the modern stage of development of military education project-based learning is widely studied by native [2–4] and foreign researchers [1, 5, 6]. Some works [7–9] are devoted to implementation of project-based learning in the process of training of future officers.

The findings of native and foreign scholars in the sphere of training future military officers [7, 10] coincide and they prove that project-based learning is an important component of military education of productive profile. It is a non-standard and non-conventional tool of

organization of the educational process at the higher military institution through affirmative actions like planning, forecasting, analysis and synthesis. Mostly, project-based learning is oriented towards the application of the person-centered approach [8, 9].

Project-based learning is a new pedagogical person-centered technology that reflects main principles of the humanistic approach in military education [10]. This technique includes the best ideas of conventional and modern methodology of training of future military officers as it brings a variety of pedagogical tools and exercises, educational problem, novelty, cadets' initiative at the lesson. Some pedagogues [7] claim that project-based learning enhances the efficiency of independent work (individual, group and collective) as the cadets are able to carry out some exercises for a limited time and find an appropriate solution of tasks.

Problem-based learning is a typical form of cooperative and research-based technique that is characterized by active learner engagement and mutual learning [6]. Also, future professionals who learn through the problem-based learning usually work together to solve a specific problem, develop a product for a specific audience, and then evaluate the project and development process [5].

The main aim of this technology is to create active team work of cadets in different educational situations when every participant is responsible for own activity and for the whole team [3]. Project-based learning allows the instructor to transform the traditional lesson into discussion and research work when the cadets solve interesting and professional tasks. The technology can be used during the lesson and as extra-curricular activity. It stimulates the development of cognitive activity of cadets, their motivation to learning, activation of cognitive processes, exploration of new information. Also, which is important for professional development of future officers, project-based learning encourages active participation of cadets within the educational process [6, 8].

Project-based learning gives the possibility for the learners to make educational products themselves. They start working more actively when they notice the results of their learning and when they observe the increasing level of professional competence [4]. This characteristic of project-based learning is suitable for teams that consist of a number of cadets with different levels of training as they can work in accordance with their aptitudes. The more gifted ones can reach the level they can be proud of and facilitate the task completion. The other participants can show what they have learnt and compensate some errors, while demonstrating video- or audio-material and spectacular illustrations. The cadets work in teams to analyze the cases with the instructor. At the same time the instructor or the senior cadet facilitates the team work and communication [6].

Project-based learning includes learner's actions and techniques of their organization by an instructor. That means that project-based learning is a pedagogical technology [4]. It is necessary to admit that project-based learning is originated from problem-based technology and it creates educational products by cadets under the instructor's supervision, which are characterized by novelty and practical significance. A key characteristic of project-based learning is that the project does not focus

on learning about something. It focuses on doing something. It is action oriented [11].

According to some findings [12], the learners plan and discuss the solutions of educational tasks through a seven-step method: defining concepts, defining problems, analyzing problems, explanation, formulation of learning objectives, searching additional information on a problem, and preparing a final report. Even as the cadets work in teams, there is usually an individual examination of each participant [3, 6].

But, unfortunately, only a few scholars describe the algorithms of implementation of project-based technology at the higher military institutions. At the same time very few studies are devoted to revealing the stages of project-based learning at the higher military institutions.

3. Research aim and tasks

The aim of the study is to explain the peculiarities of implementation of project-based learning technology within the educational process at the higher military institutions.

To achieve this aim, it is necessary to solve the following tasks:

1. To study the definition of project-based learning technology and describe its peculiarities within the educational process at the higher military institutions.

2. To enumerate the didactic conditions for implementation of project-based learning technology at the higher military institutions.

3. To analyze the stages of project-based learning at the higher military institutions.

4. Materials and methods

To conduct the study, we used the following methods: theoretical analysis of philosophical, psychological, educational, scientific and methodical literature was used to collect the data and select the material on the topic; theoretical modelling was used to create the structure of research and to predict the approaches of implementation of project-based learning; methods of generalization and interpretation of the research problem were used to process the necessary information; methods of comparative analysis were used to determine the optimal parameters of scientific problem and to increase the accuracy of measurements; empirical methods like observation and questionnaire of educational process participants on the effectiveness of project-based learning were used to find out the participants' attitudes towards project-based learning and find the efficiency of the technology towards cadets' achievements and learning process itself; statistical data processing was used to present the final figures accurately.

5. Results and discussion

The findings [11] show that there are some types of projects, used during the educational process at the higher military institution. They include:

Construction and practical projects mean collage, diary of observations, puzzle making and its description.

Role and games projects deal with role-plays, dramatization of personal stories, concert or performance.

Information and research projects involve studying professional problems, making a presentation on a scientific topic, discovering additional ideas using IT or special purpose software tools.

Survey projects mean conducting of questionnaires of military personnel on a professional topic and interpretation of survey results.

Production projects concern publishing books or booklets, making PowerPoint presentations, writing essays.

Performance and organizational projects suggest organization of recitals, stream-shows, blogging.

Creative projects include free making of literature products like stories, tales, comics, role-plays, poems, etc.

According to another classification [2], the projects are divided into research projects, creative projects, role-plays, games and telecommunication projects. Research projects require comprehensive substantiation of the structure, accurate objectives, topicality and professional necessity. Doing research projects, the cadets solve scientific problems and formulate research-based recommendations. Creative projects, role-plays and games allow to choose forms of work freely and they are oriented towards the formation of professional skills

through interesting and playable activities. Telecommunication projects are based on usage of computer telecommunication. Usually, such projects are interdisciplinary and involve deep knowledge integration.

Also, the project can be divided on the basis of a number of participants and duration of task performance. Thus, projects are individual (where one cadet is working independently), personal (where two cadets from different higher military institutions are working), pair (where pairs of cadets are working together), team (where successful realization of project requires a group of cadets). In addition, we differentiate short-term, middle-term, and long-term projects [13].

Despite the different types of projects, as a rule, they are realized logically, in stages. Of course, we cannot say that there is a strict algorithm for project-based learning as it is a creative process for decision-making. According to some pedagogues [2, 3], we can differentiate the four stages for the realization of project-based learning technology, while training the cadets at the higher military institution. They are the following: substantiation, searching, technological, concluding. Table 1 shows that analysis of these stages.

Table 1

Stages of project-based learning technology at the higher military institution

Stage name	Description
Substantiation (preparatory) stage	Formulation of the aim and objectives of the project itself, deciding on a hypothesis, explanation of its professional necessity, definition of the project topic, division cadets into working teams and distribution of tasks between learners, material support of the project.
Searching stage	Studying the problem and collection of information (searching the necessary data, analysis of possible solutions), generating the ideas, selection of the optimal algorithm of task completing, developing the working plan, choosing the materials and tools, deciding on form of presentation, integration of news knowledge with future professional activity.
Technological (organizational) stage	Realization of the project according to the plan, monitoring of activities of each participant, preparation of the presentation of results, correction from the side of the instructor or facilitator.
Concluding stage	Presenting the results, assessment of the project, analysis of personal and collective achievements, discussion of the project, elaboration of recommendations for the next project.

Project-based learning must be implemented under particular didactic conditions to make the educational process effective. According to pedagogical sources [4, 14], didactic conditions mean different reasons and circumstances for realization of educational activity. These conditions contribute to positive results of the training process at the higher military institution. When project-based learning technology is implemented, it is necessary to consider didactic conditions as they help to regulate the educational process and select successful technological elements.

Hence, we may state that didactic conditions for the implementation of project-based technology at the higher military institution constitute the dynamic system of appropriate factors and components that help the instructor to regulate the educational process, since the learners can realize pedagogical objectives and improve results of the educational process.

The analysis of pedagogical literature [14, 15] made it possible to claim that all didactic conditions, providing successful implementation of project-based learning technology within the educational process at the

higher military institution, can be divided into the four groups. They are the following: motivation, content, technological, and evaluation. Table 2 shows the analysis of didactic conditions in details.

According to the findings, all didactic conditions for implementation of project-based learning technology within the educational process at the higher military institution are divided in the four groups: motivation, content, technological and evaluation. Each group of conditions includes a particular number of items that affect the educational process. According to empirical research, the most effective are the following: orientation towards professional activity, usage of modern information resources, permanent methodical and information support, usage of interior and exterior control. These conditions support the educational process and bring cadets to higher achievements, while studying subjects.

The research concern professional military education and can be applied to the process of training of future specialists of civilian higher educational establishments only partially.

Table 2
The analysis of didactic conditions for implementation of project-based learning technology within the educational process at the higher military institution

Group name	Didactic conditions
Motivation group	Orientation towards professional activity; Development of personal and professional characteristics; Mutual tasking; Stimulation of cadets to participate in project-based activities.
Content group	Usage of modern information resources; Study of professional experience; Individualization of training; Transition from local tasks to integrated and interdisciplinary activities; Development of appropriate methodical materials.
Technological group	Composition of the educational process; Creation of teams for project-based activity; Usage of information-communication technologies; Space and time organization of project-based activity; Permanent methodical and information support.
Evaluation group	Announcement of assessment criteria; Visualization and presentation of the project; Discussion of activity results, feedback; Usage of interior and exterior control; Usage of mutual control and individual control.

Further, we are planning to study the system of exercises, used within the educational process at the higher military institution and we are going to elaborate the algorithm of implementation of projects during the lessons of military and special disciplines. Special attention will be paid to assessment of projects, prepared by cadets.

6. Conclusions

1. Project-based learning is a person-centered technology that is oriented towards reflection of main principles of the humanistic approach when future military officers are being trained. This technology is an example of cooperative and research-based work and it is characterized by active learner engagement and mutual learning. The cadets who learn through the problem-based learning solve together a specific problem, develop a product for a targeted audience, and then evaluate the project and the development process.

2. Didactic conditions for the implementation of project-based technology at the higher military institution constitute the dynamic system of appropriate factors and components that help the instructor to regulate the educational process, since the learners can realize pedagogical objectives and improve results of the educational process. All didactic conditions are divided into the four groups: motivation, content, technological, and evaluation.

3. Project-based learning is realized logically, in stages. As it is a creative process, there isn't a strict algorithm for participants' activities. But usually, the four stages are differentiated to implement project-based learning technology, while training the cadets at the higher military institution. They are the following: substantiation, searching, technological, concluding.

Conflicts of interest

The authors declare that they have no conflicts of interest

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