CREATION OF A SUBSYSTEM FOR EXTERNAL QUALITY ASSURANCE OF PROFESSIONAL MILITARY EDUCATION ON THE MOODLE PLATFORM

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Abstract: The paper analyzes approaches to improving the quality of military education based on feedback between educational institutions and those who are studying or have graduated, in particular, using the technologies of the Moodle platform. Based on the research findings, a subsystem for ensuring the quality of professional military education was developed and tested based on a survey of L-course graduates following their service activities using the MOODLE platform. The survey was conducted through a questionnaire with achievement tests based on a program of direct specific questions. The functioning of the subsystem was tested for the survey of graduates of the L-3 professional military education course who were trained in the 2021–2022 academic year. It has been shown that the use of information and communication technologies, in particular the MOODLE toolkit, allows visualization and processing of the results in graphical and numerical formats. The results of the study confirm the effectiveness of the developed subsystem of external quality assurance of professional military education. It is shown that it is an effective feedback tool and is designed to involve course graduates in the evaluation of educational programs of professional military education courses.

Keywords: professional military education, subsystem of external quality assurance of education, evaluation of educational programs, information and communication technologies, Moodle platform.

1 Introduction

The Military Security Strategy of Ukraine (2021) envisages such activities as:

- The development of the military education and training system of the Armed Forces.
- The study of modern combat experience and training methods.
- The introduction of training programs for officers and NCOs using NATO principles and standards (Mirnenko et al., 2021).

One of the key tasks is to achieve the strategic goals of developing the country's Defense Forces until 2030 (About the Strategic Defense Bulletin of Ukraine, 2021). The transformation of the military education system (MES) primarily involves the professionalization of the Armed Forces and other components of the Defense Forces. It also includes an achievement of cooperation with the relevant institutions of NATO member states (On the Transformation of the Military Education System, 2023). The functioning of the military education system in the context of repulsing the armed aggression of the Russian Federation is the main factor that causes rapid and qualitative changes in the training of military personnel for the benefit of the defense forces. High-intensity military operations in the context of significant changes in the forms, methods, and means of warfare and armed struggle require intensification of reserve training, especially in human resources.

In the era of rapidly changing technologies and the requirements of modern military training, the creation of an effective subsystem of external quality assurance is becoming an important element of professional military education. In this article, we will address the importance of integrating an external quality assurance subsystem in the context of military educational institutions focusing on the Moodle platform. This modern educational tool provides unique opportunities for creating and optimizing educational processes. This makes Moodle an attractive solution for improving the quality of professional military education. By improving this system on the Moodle platform, we will be able to effectively contribute to improving the standards and results of military training. This will provide the best conditions for the successful training of future military professionals.

In the modern world of high-tech military training, creating effective subsystems for external quality assurance in professional military education becomes a key task. Existing quality assurance systems in military educational institutions often do not meet modern standards and requirements for military training. The lack of structure and inefficiency in existing quality control methods in military educational institutions can negatively impact the learning process and the readiness of military professionals. Existing educational platforms are not always able to effectively integrate quality assurance subsystems. They require the development of specialized approaches for the Moodle platform. The absence of standardized methods for assessing and controlling the quality of education on the Moodle platform may reduce trust in this system in the context of military education.

The need to consider the specifics of military education, such as crisis management and strategic planning, in developing external quality assurance subsystems becomes an important aspect. The absence of a clear methodology for assessing the professional skills and competencies of military professionals through the Moodle platform requires the development of specialized tools and approaches.

Existing problems with data security and confidentiality on educational platforms can be an obstacle to the successful implementation of external quality assurance subsystems. The lack of clear standards in the field of military education on the Moodle platform may lead to discrepancies in assessing the quality of training and preparation of military personnel. Therefore, the development and implementation of specialized external quality assurance subsystems on the Moodle platform is a relevant task. It requires a comprehensive analysis and innovative approaches to ensure the effectiveness of the professional education of future military specialists.

2 Literature review

The feedback issue between educational institutions and those who are studying or have completed their studies has always been the focus of educators and researchers. The Law of Ukraine “About Education” (2017) is a vital source in discussions on military education. In Zelnytskyi's article (2021), the essence of feedback in the management system of changes in military education is defined in terms of transitioning from the current state to the desired state under the influence of specific factors from the external and internal environment. The author proposes an approach to forming the content of feedback for graduates of educational institutions based on the results of their service in a unit (military unit). This methodology is used to provide input to graduates of educational institutions and to assess the level of formation of specific competencies and professional qualities of graduates.

The author suggests developing feedback with graduates based on a list of competencies and a five-point scale for assessing the degree of acquisition of competencies by graduates. Matsevko and Hodovanskyi (2021) analyzed the normative legal acts of military education on the assessment of learning outcomes of higher military education institutions (HMEIs) graduates based on the results of military service as one of the elements of information support of the educational process. The authors identified inconsistencies in the provisions of regulatory acts that shape approaches to evaluating the training results of HMEI graduates.

The article by Orda et al. (2021a) is dedicated to studying the issue of legal support for the creation of a system for collecting and processing information on the evaluation of education quality based on the results of military service of HMEI

graduates, harmonized with the modern approach of NATO member states. The authors analyze legislative requirements for assessing the activities of officers according to NATO standards and approaches that exist in Ukraine's Armed Forces. They emphasize the intersection of the content of officer assessment cards and feedback with graduates.

The study emphasizes that feedback from graduates of military colleges after one year of service is the only means of evaluating their educational achievements. The research by Syrotenko and Artamoshchenko (2021) is devoted to summarizing military education and training based on NATO standards.

Jukka (2014) examines the process of students' feedback in improving the quality of higher education. The author emphasizes the importance of reliable and timely feedback for the development of educational programs and for improving education quality. The use of students' feedback is considered from the standpoint of two parallel processes: for the university and the student. Given that universities are service providers and students are their consumers, the authors emphasize that understanding both of them and the two processes allows for a new look at the phenomenon of cooperation between them. A similar opinion is expressed by Selvaraj and Azman (2020). The feedback is a mechanism for eliminating shortcomings and gaps in learning. It is noted that feedback should focus on fundamental aspects of learning that can improve the learning process and achieve certain results. Another important and relevant issue in research and publications is the creation and use of information systems and platforms to solve educational problems. For example, the monograph by Bocharov and Voevodina (2015) summarizes the experience of building and using information technology in the educational process as a basis for ensuring the quality of educational activities, as well as internal and external components of quality assurance systems. It also addresses the issues of program implementation of the information technology developed by the authors, using the Moodle system as an example.

The paper by Orda et al. (2021b) considers the technical aspects of building a system for collecting and processing information to assess the quality of higher education for graduates of higher education institutions by the relevant results. The authors consider the process of collecting information for evaluating the quality of education of university graduates through an electronic document management system by receiving feedback from emergency services, postal services, or military unit commanders. In addition, they propose to create an independent automated information system. The article by Haitan (2022) discusses the use of webinar platforms such as Zoom, Google Meet, and Microsoft Teams in high schools and universities. The author emphasizes that profound knowledge and the use of these platforms by teachers is the key to successful learning. Moreover, various services of these programs can make the teaching process more exciting and compelling. The issue of the formation and development of information and communication competencies (ICC) of both students and teachers is also relevant today. The article by Sudnikov (2023) analyzes the main problems of ICC formation and suggests ways to improve and develop ICC. In NATO member countries, educational activities are regulated by international education quality standards, national regulations, and many NATOs doctrinal documents. For example, NATO's Strategic Force Integration Directive on Education and Individual Training 075-007 (2015) defines the components of a quality management system. These include course evaluation and review as feedback elements within the systematic approach to military education in NATO (Allied Command Transformation, 2015).

Several studies have also been devoted to various aspects of the Moodle system. Thus, the authors Oliynyk et al. (2021) describe the information and educational Moodle for teaching general technical disciplines. The article by Batsurovska et al. (2021) discusses methods of organizing conferences through distance learning in the Moodle system. The paper by Babenko et al. (2019) deals with the use of monitoring in the Moodle system of the information and educational environment. The article by Macías et al. (2023) is devoted to the problems of using Moodle in the university center. Lysenko (2023) describes the features of the distance and blended learning organization on the Moodle platform. The study by Karishma and Raghuwaiya (2023) is devoted to the correlation between the student activity log in Moodle and other forms of participation in a compulsory English course. The study by Krupali (2019) discusses the use of Moodle in teaching methodology. The work of Rotelli and Monreale (2023) on processing and understanding Moodle log data and its temporal dimension.

However, it should be noted that the problem of creating a subsystem of external quality assurance of professional military education on the Moodle platform has not been sufficiently studied by scholars.

The study aims to create and test a subsystem of external quality assurance of professional military education based on a survey of L-course graduates following their service activities on the MOODLE platform.

3 Methods

Research methods include:

- Analysis of scientific literature. A literature review was conducted to identify current approaches to external quality assurance of military education. This includes an analysis of existing quality control systems and their compliance with modern standards.
- Analysis of approaches to improve the quality of military education. The authors investigated various strategies and methods based on feedback between educational institutions and students, including the use of Moodle platform technologies.
- Development and testing of surveys. Questionnaires were designed and tested to assess the quality of professional military education using psychological methods and test tasks. The test and survey technologies were implemented and used. In particular, the Moodle platform was used to visualize and process the research results. The effectiveness of the developed subsystem was analyzed using feedback from the participants of the training process. Also, the authors analyzed the results and compared them with the existing standards.

4 Results

One of the effective tools for the professionalization of defense personnel has been the implementation of training in the professional military education system. The NATO directive “Education and Individual Training” requires the mandatory use of an information system by educational institutions to collect and analyze information, as well as effectively manage the educational process (About the Strategic Defense Bulletin of Ukraine, 2021). Existing approaches in the Armed Forces of Ukraine to managing the quality of military education are oriented towards periodic and final control of acquired competencies and achieved learning outcomes. Currently, in addition to the ongoing and final assessment of learning outcomes (as a component of internal assessment), some aspects of external assessment are used (Orda et al., 2021a), including:

- Certification of HMEI graduates before conferring military rank.
- Periodic and annual assessment based on the results of service activities.
- Feedback on HMEI graduates after one year of military service.

In assessing the quality of training at HMEI, feedback from graduates after one year of service is considered the most objective and informative. By using this tool, HMEIs have the opportunity to receive feedback on the effectiveness and practical orientation of the training program. Typically, based on

these reviews, adjustments are currently made to educational programs and training content. The issue of preparing feedback on HMEI graduates is covered in the Methodological Recommendations for preparing feedback on HMEI graduates, approved by the Minister of Defense of Ukraine. According to the recommendations, the input contains evaluation results on a 4-point scale (excellent, good, satisfactory, unsatisfactory) specifically for:

- Core subjects of individual training (humanitarian training, mobilization training, tactical training, fire training, formation training, physical training, etc.).
- Social-personal competencies (moral-ethical, psychological, information-communicative, etc.).
- General professional competencies (legal, organizational-managerial, general military, individual-educational, etc.).
- Specialized professional competencies (tactical-specialized, military-technical, etc.)

Thus, a year after the training, HMEI receives feedback with a fairly large number of ratings (on a 4-point scale) of competencies and practical skills. However, the educational practice of HMEI indicates that the process of making changes to academic programs based on feedback from graduates is quite problematic due to the weak correlation between the components of graduate assessment in input and the content of educational programs and training plans. It is difficult to assess which specific elements of education should be given attention.

Currently, HMEI has implemented a distance learning system on the Moodle platform, oriented towards real-time work, one-time report generation, and subsequent review. The practical experience of HMEI in conducting internal assessment activities for professional military education courses L-2, L-3, and L-4 during the experimental phase and throughout their testing convincingly demonstrates that the Moodle platform, with its properties, is an entirely acceptable foundation for creating a course assessment system for professional military education.
Since 2019, HMEI has been evaluating officer courses at various levels of military education (Syrotenko & Artamoshchenko, 2021):

- At the strategic level, the “Higher Leadership Course (L-4)” teaches the process of forming and implementing national security policy in the military, defense, and construction sectors.
- At the operational level, the “Unified Staff Officers Course (L-3)” teaches the process of operational planning for troop (force) groups of the Unified Staff according to NATO JOPP (Joint Operations Planning Process).
- At the tactical level, the “Command and Staff Course (L-2) (Ground Forces, Air Forces, and Naval Forces)” aims to teach procedures for making military decisions according to NATO MDMP (Military Decision-Making Process) standards at the brigade (battalion) level of command, as well as the “Basic Course (L-1A)” and “Professional Course (L-1B)”, which aim to teach procedures for making military decisions according to NATO TLP (Troop Leading Process) standards.

The complex of L-courses serves as the basis for military education as a component of the professional training of officer personnel (About Education, 2017). In the conditions of countering armed aggression from the Russian Federation, training on L-courses has become an essential tool for quickly meeting the needs of preparing officer personnel at the tactical, operational, and strategic levels with an orientation towards compatibility with NATO (About the Strategic Defense Bulletin of Ukraine, 2021).

One of the essential elements on the way to meeting the criteria for membership in the North Atlantic Treaty Organization is ensuring the quality of military education (Syrotenko & Artamoshchenko, 2021). The assessment in the external quality assurance subsystem of professional military education in the context of the Moodle platform aims:

- to establish the sufficiency, effectiveness, and accessibility of the educational course,
- to identify ways to improve and enhance it.

The review of the L-course is a structured and regular process. The initial review of the conducted course includes internal evaluation – a report processed based on assessments and participants' feedback. It also includes observations by instructors regarding the course's outcomes. Subsequently, external evaluation occurs based on surveys of graduates and their supervisors from places of professional activity. Graduates provide feedback on the application of acquired knowledge and skills in their professional activities. Such surveys are typically conducted six months after completing the training. The collected data is later analyzed to determine whether individuals are learning the necessary things at the required level. The extensive information obtained is carefully analyzed and used to update the course content accordingly. The experimental basis for creating the external quality assurance subsystem of professional military education is the educational program of the “For Officers of Unified Operational Level Staff L-3” course. The latter was tested at the National Defense University of Ukraine in 2020 (Curriculum program of the courses, 2020).

The research was conducted by creating a survey on the Central Repository of Resources of the Distance Learning System of the Armed Forces of Ukraine platform (https://adl.mil.gov.ua/) for L-3 course graduates. The graduates' survey was carried out using a psychological diagnostic method that assesses the degree of a military service member's mastery of specific knowledge, skills, and abilities. The survey was implemented through questionnaires with achievement tests based on the program of direct particular questions. The respondents could provide clear “yes” or “no” answers. The development of the questionnaires was based on the decomposition of tasks of practical (professional) activities, the formation of learning outcomes for each block (module) of the L-3 course according to NATO performance qualification levels and complexity levels in cognitive, psychomotor, and affective domains, and the determination of their descriptors (About the Strategic Defense Bulletin of Ukraine, 2021).

The participants in the experiment were graduates of the L-3 course who underwent training in the academic year 2021–2022. The authors do not disclose numerical indicators of course graduates who participated in the survey due to the confidential nature of such information under the conditions of the legal regime of martial law. The experiment (survey) was conducted no earlier than 6 months after the completion of training during the 2022–2023 academic year. The processing of the survey results was based on the method of expert evaluation and SWOT analysis (dividing factors and phenomena into four categories: strengths, weaknesses, opportunities, and threats).

According to the tasks of the quality assurance subsystem of professional military education, self-assessment of graduates based on the results of their service is carried out through a survey, which is built on a list of training outcomes with questions about the use of this knowledge and skills, as well as the degree of their application (including frequency). The questionnaire matrix is built on the components of the course (blocks, modules, topics, etc.). For each element, a list of training outcomes is formed.

For each training outcome, the respondent provides answers to two groups of questions:

- The first group reflects the degree of use of a specific training outcome (knowledge, skills) in practical activities and the respondent's ability to apply this outcome (knowledge, skills) during the performance of official duties (used or not, capable or not).
- The second group reflects the degree of influence of a specific training outcome on the development of new abilities and the performance of other tasks (whether it influenced the growth of new opportunities) and the

importance of this outcome (knowledge, skills) during the performance of official duties.

The basis for forming groups of questions and further evaluating training results is the SWOT analysis. The first group of questions focuses on strengths and weaknesses, while the second group focuses on identifying new opportunities and threats. Engaging a sufficient number of respondents allowed for forming a general attitude towards each training outcome, i.e., its objective evaluation.

The survey of graduates is conducted using the method of expert evaluation. At the stage of forming opinions on each training outcome, the respondent assigns a score independently and independently of others. If the answer is "yes", the respondent gives 1 point, "no" – 0 points, and if a clear answer is not possible – 0.5 points. Giving an identical (affirmative) answer to two opposite questions of one group is impossible. An example of designing the questionnaire matrix is provided in Table 1.

Table 1. Creation of a questionnaire matrix based on SWOT analysis

List of blocks (modules), competencies, and learning outcomes	Survey questions				
	Group 1			Group 2	
	I needed it and used it in my professional activities		I did not need and did not utilize it	It has influenced (become the basis for) the development of new knowledge, skills, etc.	Failure to do so could have led to an inability to fulfill the task(s)
	I was capable (I knew; I had skills)	I failed (I didn't know, I didn't know how)			
module 1					
learning outcome 1					
learning outcome 2					
…					
learning outcome *N*					
module *M*					
learning outcome 1					
…					
learning outcome M_n					

Source: author's development

The evaluation of each learning outcome is determined as the arithmetic average of the grades obtained for all assessments. Assessment is conducted under the assumption that all learning outcomes are equivalent. The criteria for determining the level of correspondence of learning outcomes are formed based on parameters that allow for a clear delineation of its state. They provide a single affirmative answer, "yes" or "no", and a unified scale for assessing the probability of a random event occurring. The assessment of each learning outcome is carried out according to levels of correspondence and criteria as outlined in Table 2.

Table 2. Criteria for determining the level of compliance with the learning outcome

Number of points, % of respondents	Probability of Event Correspondence	Responses regarding application in practice	SWOT analysis result	Level of compliance
0…29	0…0,29	definitely "NO"	More weaknesses and threats	D
30…50	0,30…0,49	rather "NO"	More weaknesses and threats are not significant	C
59…74	0,50…0,74	rather "YES"	More strengths, there are new opportunities	B
75…100	0,75…1,00	definitely "YES"	More strengths and new opportunities	A

Source: author's development

Levels of correspondence describe the degree of achievement of the learning outcome per the declared level of complexity in the educational program and its application in practical activities:

- Level "A". The degree of achievement of the learning outcome fully corresponds to the requirements regarding the level of complexity. The graduates apply the acquired knowledge and skills in practical activities.
- Level "B". The degree of achievement of the learning outcome overall corresponds to the requirements regarding the level of complexity. The graduates apply the acquired knowledge and skills in practical activities.
- Level "C". The degree of achievement of the learning outcome overall does not correspond to the requirements regarding the level of complexity. The graduates do not predominantly apply the acquired knowledge and skills in practical activities.
- Level "D". The degree of achievement of the learning outcome does not correspond at all to the requirements regarding the level of complexity. The acquired knowledge and skills are not precisely applied in practical activities by the graduates.

According to the survey results, the level of compliance of a particular learning outcome with the requirements of the educational program is summarized and determined in terms of complexity and professional needs. Based on the set of answers to the same question, information on each question is summarized depending on the number of positive or negative answers. An example of building a matrix for processing survey results is shown in Table 3.

Table 3. An example of building a matrix for processing survey results

List of blocks (modules), competencies, and learning outcomes	Survey questions					
	Group 1				Group 2	
	Total score (importance)	Rate	Total score (ability)	Rate	Total points	Rate
Block 1 (module 1)						
learning outcome 1	82	A	76	B	71	B
learning outcome 2	26	D	21	D	31	C

...						
learning outcome ...n						

Source: author's development

The text discusses the results of a survey. It draws the following conclusions regarding:

- the correctness of formulating and establishing the level of complexity in cognitive or psychomotor domains;
- achieving the declared level within the allocated time budget;
- types of educational activities, methods of achievement;
- assessment of learning outcomes, etc.

It also identifies a list of learning outcomes that were not utilized by graduates in practical activities. Based on a comprehensive assessment, decisions are made regarding removing these learning outcomes from the educational program or reviewing their complexity level. The survey results were evaluated by a group of experts, including scientific and pedagogical staff. A commission method was employed to summarize expert assessments for a specific learning outcome, where experts discuss the overall evaluation. This approach was tested during the institutional audit of professional military education in educational institutions of the Ministry of Defense and the Armed Forces of Ukraine in 2020.

The obtained result was announced in points for each learning outcome, and a final evaluation was discussed. Also, the SWOT analysis method assessed strengths and weaknesses, risks, and new opportunities. This approach allows for the implementation of changes in educational programs based on specific learning outcomes rather than overall subject areas. It increases the accuracy of assessment and the effectiveness of program implementation by evaluating the quality of education obtained. Following the defined approaches, a survey of L-3 course alumni was created on https://adl.mil.gov.ua/ using Moodle tools. This website is administered by the National Defense University of Ukraine. Per the experiment's conditions, access to the survey was granted to course graduates who completed their studies in the 2021–2022 academic year. The starting page of the external quality assurance subsystem creation for professional military education in the Moodle platform's context of the Moodle platform survey (Figure 1) provides general information about the purpose and conduct of the study and the method of providing answers.

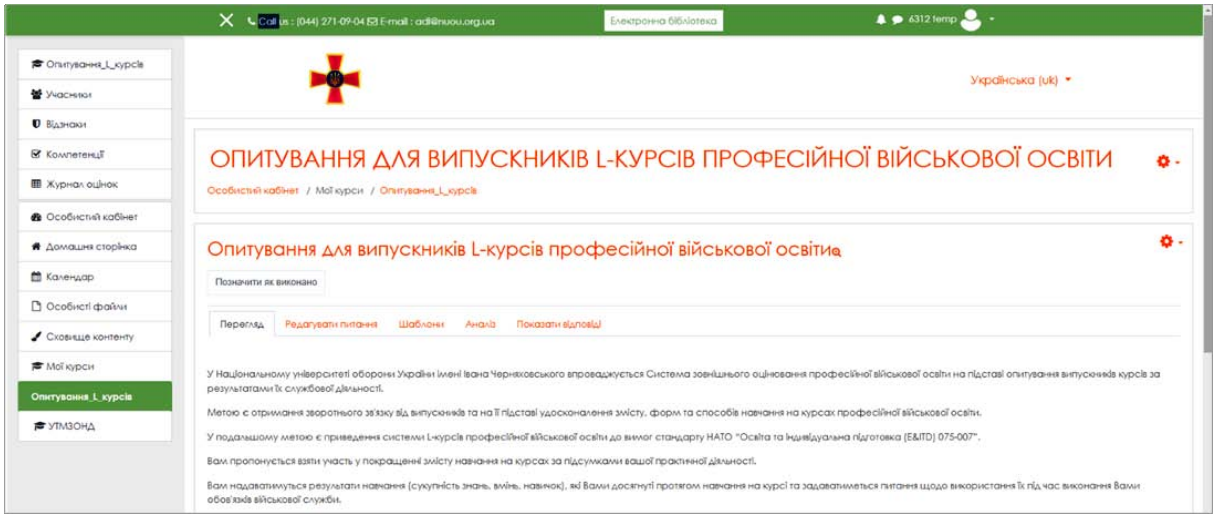


Figure 1. The initial page of creating a subsystem of external quality assurance of professional military education on the Moodle platform survey of professional military education course graduates

Source: author's development

The internal structure of the survey is organized according to the matrix (Table 1) and includes a set of learning outcomes in corresponding blocks. The number and names of the blocks in the survey, as well as the learning outcomes, correspond to the structure of the educational program of the course for officers of the Joint Staff L-3. The latter was implemented in the academic year 2021–2022 (a total of 12 modules and a total of 50 learning outcomes). An example of visualizing the internal structure of the survey for Module 1, “Military Leadership”, is presented in Figure 2.

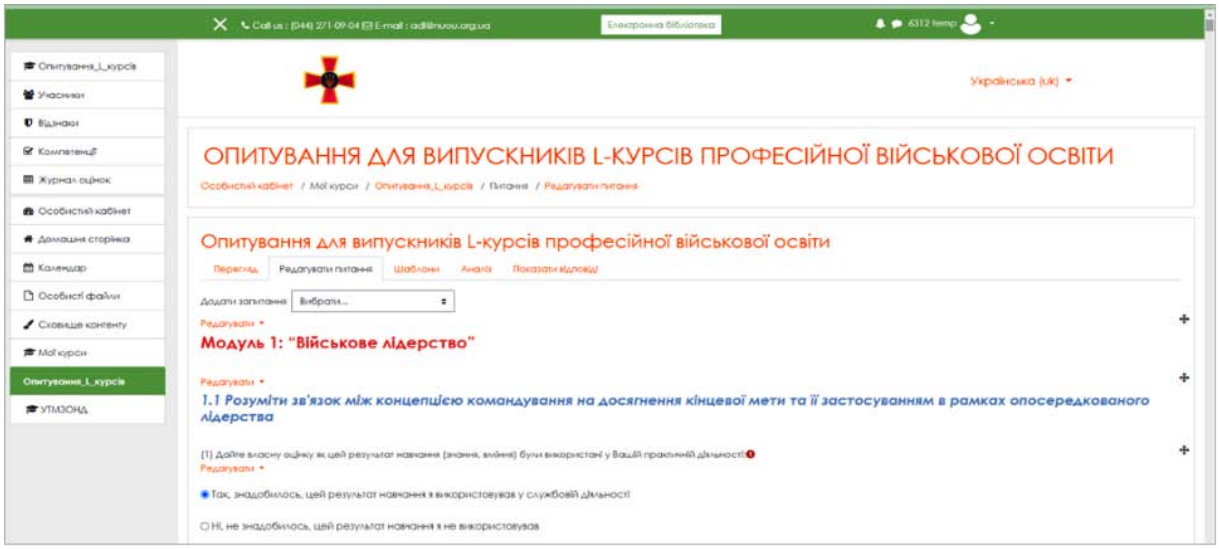


Figure 2. Internal organization of the questionnaire when creating a subsystem of external quality assurance of professional military education on the Moodle platform for graduates based on the results of training in the relevant modules (on the example of Module 1)
Source: author's development

Following a similar approach, the rest of the learning outcomes are provided, and other survey blocks are constructed.

According to the established algorithm, providing an answer to the first set of questionnaire questions regarding the use of a specific learning outcome in professional activities is envisaged (Figure 3, a). When answering "Yes, I needed it, I used this learning outcome in professional activities", the second part of the first set of questions regarding the ability to use this outcome is opened (Figure 3, b).

In the case of answering "It was needed, I used in professional activities", a transition to the second set of questions is also made. This provides an opportunity to assess the impact of this learning outcome and other possibilities (Figure 3, c).

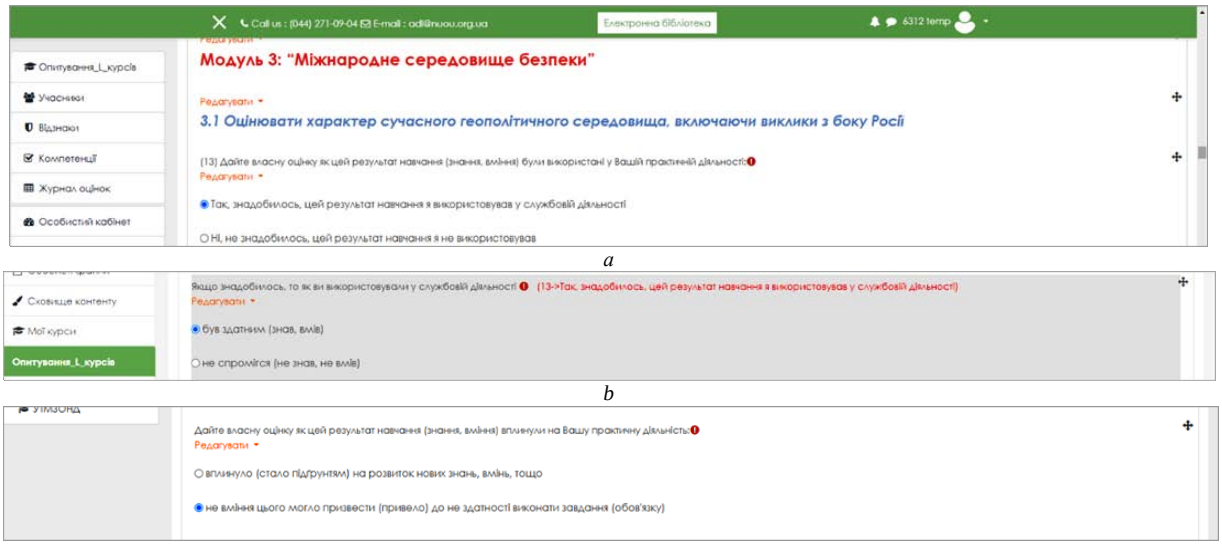
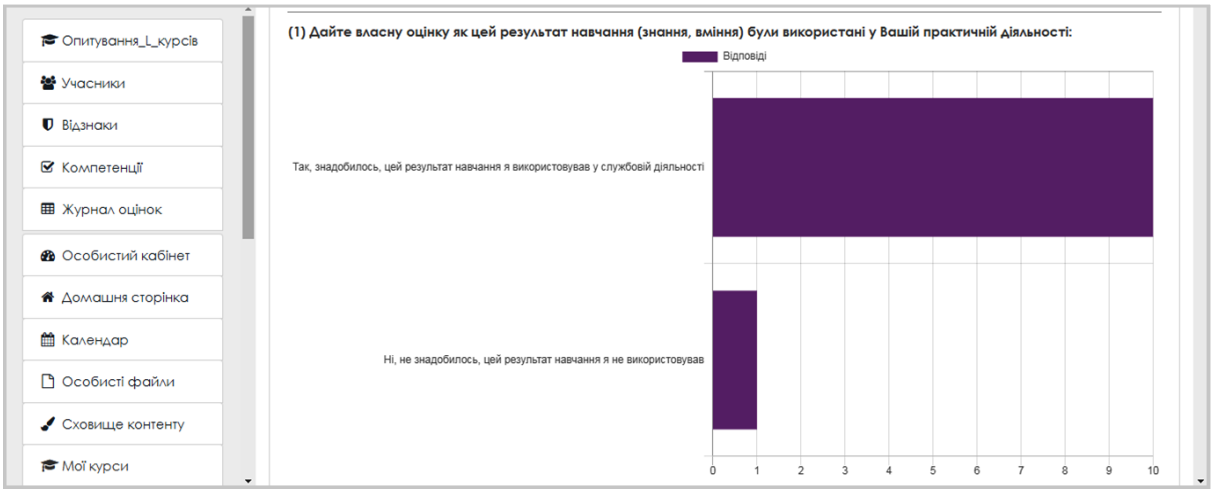


Figure 3. Visualization of answers to the questionnaire of external quality assurance subsystem of professional military education on the Moodle platform (on the example of the 1st learning outcome of Module 3): for part 1, 1st group of questions (a); for part 2 of the 1st group of questions, in case of a positive answer on the use of a certain learning outcome (b); for the 2nd group of questions (c).
Source: author's development

Providing answers to the questionnaire of the subsystem of external quality assurance of professional military education on the Moodle platform according to the proposed scheme allows to obtain a set of answers that are available for analysis in graphic (Figure 4, a) and digital (percentage) formats (Figure 4, b).

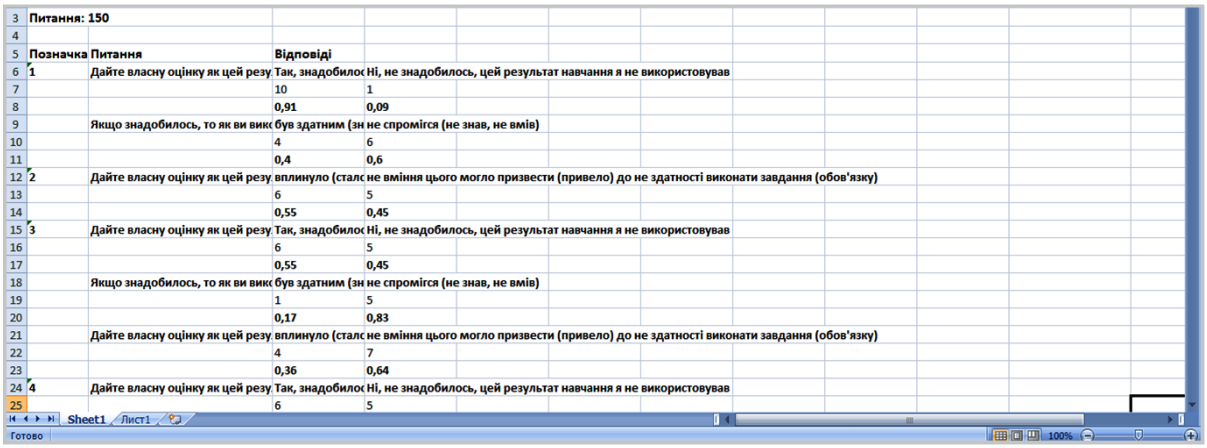
Also, given the available Moodle tools, it is possible to export the survey results to an Excel spreadsheet (Figure 5). It significantly expands the possibilities of analyzing and statistically processing the results.



a

b

Figure 4. An example of analyzing survey results in the subsystem of external quality assurance of professional military education on the Moodle platform: graphic format (a); digital format (percentage) (b)
Source: author's development



3	Питання: 150			
4				
5	Позначка	Питання	Відповіді	
6	1	Дайте власну оцінку як цей резу	Так, знадобилос	Ні, не знадобилось, цей результат навчання я не використовував
7			10	1
8			0,91	0,09
9		Якщо знадобилось, то як ви вик	був здатним (зн	не спромігся (не знав, не вмів)
10			4	6
11			0,4	0,6
12	2	Дайте власну оцінку як цей резу	вплинуло (стало	не вміння цього могло призвести (привело) до не здатності виконати завдання (обов'язку)
13			6	5
14			0,55	0,45
15	3	Дайте власну оцінку як цей резу	Так, знадобилос	Ні, не знадобилось, цей результат навчання я не використовував
16			6	5
17			0,55	0,45
18		Якщо знадобилось, то як ви вик	був здатним (зн	не спромігся (не знав, не вмів)
19			1	5
20			0,17	0,83
21		Дайте власну оцінку як цей резу	вплинуло (стало	не вміння цього могло призвести (привело) до не здатності виконати завдання (обов'язку)
22			4	7
23			0,36	0,64
24	4	Дайте власну оцінку як цей резу	Так, знадобилос	Ні, не знадобилось, цей результат навчання я не використовував
25			6	5

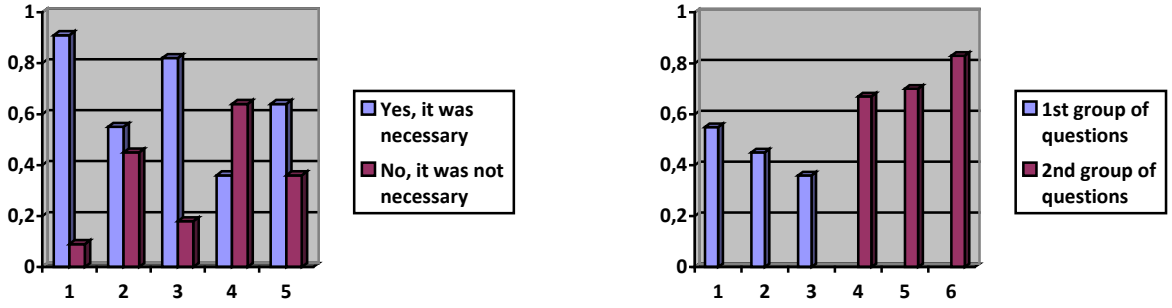
Sheet1 Лист1
Готово 100%

Figure 5. An example of survey results in the subsystem of external quality assurance of professional military education on the Moodle platform, exported to an Excel spreadsheet
Source: author's development

It is worth noting that the tabular format could be more convenient and easier to understand due to the large number of questions asked during the survey. Therefore, the use of survey data exported to Excel makes it possible to visualize the results in the form of various nomograms (Figure 6). The latter can be used in analytical reports based on the survey results.

The most reasonable approach is to conduct an analysis within each module with a subsequent comparative assessment of the obtained results or a comparative evaluation based on specific criteria, etc. In any case, the results obtained during the creation of the external quality assurance subsystem of professional military education on the Moodle platform are representative and objectively reflect the assessment of graduates' competencies and learning outcomes formed while mastering the educational program of professional military education.

Thus, the use of the Moodle platform toolkit, deployed at HMEI, is justified for the creation of the external quality assurance subsystem of professional military education. The experimental part of the external evaluation system of professional military education includes L-courses. This, given compatibility with NATO quality principles, can subsequently be certified and accredited by NATO. It is recommended to conduct surveys 6 months after the course completion, with the results summarized no later than 3 months after the start of the next course. The proposed approach will help bridge the gap between what is laid out in the educational program and what is actually needed to perform functional duties. It will also allow the educational institution to react promptly to the implementation of educational programs by making changes in line with the results of their application in service (military-service) activities.



a *b*

Figure 6. Examples of survey results' nomograms in the subsystem of external quality assurance of professional military education on the Moodle platform:
For the 1 group of questions within the module (a);
For all questions by learning outcome (b) following the questionnaire matrix (Table 1): 1 – "I found it useful, I used it in my work";
2 – "I did not need it; I have not used it";
3 – "I was able to (I knew, I managed)";
4 – "I was not able (I did not know; I could not do it)";
5 – "It had an impact (was the basis) on the development of new knowledge and skills".
6 – "Failure to do this could have resulted in my inability to complete the task".
Source: author's development

5 Discussion

The article discusses the drawbacks of current quality control systems in military education and their inconsistency with current standards. The authors discuss the issues that may arise due to the lagging of quality control systems with modern requirements. At the same time, they emphasize the importance of military education processes complying with modern standards. The discussion focuses on the impact of using the MOODLE platform on assessment and quality assurance processes. It discusses how technologies, including MOODLE, can improve the learning and assessment processes in military education. There is some debate in the context of the potential for a discrepancy between how MOODLE is integrated into the military education system and the expected results. Some studies emphasize the importance of technological compatibility, while others point to the usability of MOODLE for users.

The article discusses the research findings, their practical applicability, and their generalized value for improving military education systems. The interaction of the present study with previous research on military education and quality control systems is also discussed.

6 Conclusions

Thus, a subsystem of external quality assurance of professional military education in the context of the Moodle platform was created and tested. It is aimed at eliminating the discrepancy between the requirement of the NATO standard "Education and Individual Training" to involve graduates of professional military education courses in the evaluation of educational programs in the Armed Forces of Ukraine and the lack of a mechanism and tool for involving graduates in the assessment of academic programs in the Armed Forces of Ukraine.

Finally, the creation of a subsystem of external quality assurance of professional military education on the Moodle platform is an essential step in the modern era of educational technologies. The implementation of this subsystem will allow to effectively cope with the challenges faced by military educational institutions in ensuring high standards of education and training of specialists in the HMEI. The integration of modern assessment methods, control, and standardization on the Moodle platform will improve the quality of education and help keep military skills up-to-date. This approach enables the creation of a high-tech and adaptive training system that meets the needs of the modern army. In general, the development and implementation of the external quality assurance subsystem on the Moodle platform is a promising direction for further improvement of professional military education.

Further research on this topic can be carried out by conducting an in-depth analysis of the effectiveness of external quality assurance subsystem implementation, including:

- the use of multidimensional approaches to assess the impact of the created subsystem on the quality of military education (performance, satisfaction, and feedback effectiveness);
- the research of current trends in teaching methods;
- the development of strategies for integrating innovative educational approaches in the context of military education.

These research areas can complement the current understanding of the effectiveness of the created subsystem and contribute to the further improvement of military education on the Moodle platform.

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Primary Paper Section: K

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