Using Professionally-Oriented Electronic Educational Resources to Enhance Foreign Language Competence of Future Border Guard Officers

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Abstract

Nowadays, in the context of the restrictions imposed by pandemic and war initiated by Russian federation, it became indispensable to make adjustments to the educational process and use relevant methods to teach future border guard officers of Ukraine foreign languages in order to maximize the efficiency of the educational process at the higher military educational institution. The results of the analysis of practical experience, as well as taking into account the best international practices for training security and defense sector officers, made it possible to determine the optimal electronic educational technologies that can be used for foreign language training of future officers in the context of a various restriction to the educational process. To test the effectiveness of integrating electronic educational resources into the training of future officers, four training groups of the National Academy of the State Border Guard Service were involved, who studied at the same course in the specialty "State Border Security" and "Telecommunications and Radio Engineering". Professional training in the experimental group was carried out with the maximum possible application of electronic educational resources. The effectiveness of integrating professionally-oriented training programs with interface in English, as well as specifically designed ESP distance learning course into the system of professional training of future officers has been proved in practice. This was confirmed by the results of diagnostics of academic achievements of cadets who used electronic means for professional English language training. Although, it is recommended to adhering to a certain ratio of the share of classes using electronic educational resources and practical contact classes.

Keywords: electronic educational resources, border guards, professional training, distance learning, foreign language

1. Introduction

The urgency of solving the problem of improving the quality of foreign languages training of the personnel of the State Border Guard Service of Ukraine (SBGSU) is caused by the need to establish an effective system of preventing and countering threats to national security. This requires intensification of the educational process, as there is a constant modernization of the equipment and software used by officers of the SBGSU, introduction of new types of data bases and information technologies for border control.

In the context of the pandemic and full-scale war initiated by Russian federation, it became indispensable to make adjustments to the educational process and use relevant methods to teach future border guard officers to maximize the requirements of educational process under quarantine restrictions. A characteristic peculiarity of organization of border guards professional training involves acting of the SBGSU officers as representatives of law enforcement agencies of special purpose and perform specific tasks and functions (including operational and service ones). This makes it impossible to disseminate the electronic educational resources (EER) used to train border guards on the Internet due to the need to ensure a high level of information security. That is why the educational process in border guard educational institutions does not provide for the full use of mobile learning (smartphones, tablets), but is focused on expanding the capabilities of the intra-departmental (border guard) Intranet. Given this, one of the main directions of intensification of the educational process at the National Academy of the State Border Guard Service of Ukraine named after Bohdan Khmelnytskyi (NASBGSU) is the use of specially designed electronic educational resources with limited access, as well as the development of educational information environment of the Academy, including informational technical means of training (personal computers, multimedia means, information data storage devices); software (applied (training) programs, diagnostic (control) programs); electronic data sources (electronic textbooks, electronic information databases). The results of the analysis of practical experience, as well as taking into account the best international practices for training security and defense sector officers, made it possible to determine the optimal electronic educational technologies that can be used to train future border guard officers. The effectiveness of integrating electronic educational resources into the foreign languages training of future officers in conditions of social distancing has been proved in practice.

2. Literature Review

Using EER in higher military educational institutions have repeatedly attracted attention of scientists. The studies of Kos (2018) and Johnson-Freese (2012) present the experience of using simulation modeling of tactical (combat) operations in the professional training of military personnel of the armies of leading countries of the world. Also, Balendr, Komarnytska, Bloshchynskyi and Didenko (2018) reviewed experience of using information and communication technologies (ICT) in foreign language training of border guards. Komarnytska, Balendr, & Bloshchynskyi (2019), Lagodinsky, Buyalo, & Hamula (2021), Didenko, Androshchuk, Maslii, Balendr, Biliavets (2020) reveal the use of ICT in the educational process. Soroka, Kalaur, Balendr (2020), Balendr, Komarnytska, Didenko, Kalaur, Soroka, Biliavets, Khamaziuk (2023) outlined the trends in the development of information and communication technologies in foreign language training of border protection specialists in the EU countries. The articles of Andriyanov (2016), Lokar (2015), Farion, Balendr, Androshchuk, Mostovyi, Grinchenko (2022) present the experience of using software to monitor the educational achievements of future officers. Choi and Lam (2018), Katerynchuk, Rachok, Mul & Balendr (2016) reveal the use of information and communication technologies, simulators and simulation tools in the educational process. In their studies Zhang J. & Zhang L. (2015) elaborated the hierarchical model for developing e-textbook to transform teaching and learning, as well as presented the prospective directions for developing e-textbook. However, the integration of electronic educational resources into the foreign languages training of future border guard officers has not been the subject of scientific research yet.

The purpose of the article is to present the results of the study of the effectiveness of integrating professionally-oriented electronic educational resources to enhance professional foreign language competence of future border guard officers at the Higher Military Educational Institution.

3. Research Methods and Tools

The study of the effectiveness of integrating EER into the foreign languages training of future officers of border guard specialties was based on the use of a set of methods that made it possible to obtain quantitative values regarding the quality of cadets' formation of knowledge, skills and abilities. We are talking about testing, oral and written interviews of cadets, graphic and practical checks, as well as analysis of the results of training activities of future officers.

Bohdan Khmelnytsky National Academy of the State Border Guard Service of Ukraine (NASBGSU) was chosen as the experimental base for the study. To test the effectiveness of integrating electronic educational resources into the training of future officers, four training groups were involved, who studied in one course in the specialty "State Border Security" (two training groups) and "Telecommunications and Radio Engineering" (also two groups) in the period from September 2020 to May 2021.

Integration of electronic educational tools into the foreign languages training of cadets of border guard specialties during quarantine restrictions, encompassed utilizing a modular environment of the discipline "Border control", with special software programs with an interface developed in English: documents checking program "Trainer", a computer simulator for determining age-related facial changes "Wiek" and a computer test "FaceID". Also for the specific needs of the future border guards was designed an e-learning course "English for Professional Needs". To check the effectiveness of the e-learning course a test was carried out taking into account international standards for testing the level of language proficiency in accordance with the NATO STANAG 6001.

Due to the fact that cadets did not study subjects related to the use of EER before the start of the study, an entry-level assessment was not conducted. The choice of these four training groups was due to the fact that at the beginning of the experiment they had approximately the same average results of educational activities (quality and academic performance) and the same number of cadets who had approximately the same characteristics by age, gender, attitude to acquiring a future specialty, etc. From these training groups, an Experimental Group was formed (EG, n=102). Training in the EG was carried out with the maximum possible application of EER. Access to these EER was carried out by connecting to the interactive electronic environment of the NASBGSU from computers in classrooms and their handheld gadgets.

Independent work of EG cadets also provided access to computers in classrooms connected to the departmental (internal) Intranet network. EG cadets also used the possibilities of e-learning, which covered the potential of electronic libraries, educational and methodical multimedia materials, virtual laboratories, workshops and other internet technologies). For this purpose, during the quarantine restrictions, access to the electronic educational environment was provided from any electronic device, provided that the user is identified using a username and password. Also, within the departmental Intranet network was created a user-friendly interface that provided communication between cadets and teachers, the ability to quickly communicate with them for clarification or in-depth explanation of educational material. The discipline interface was also developed to cover lesson topics, tests and other forms of self-control.

To check the effectiveness of foreign languages training, it was proposed to compare it with data on quality and academic performance in study groups that were prepared before the introduction of restriction measures into the educational process. For this purpose, four study groups were selected, who studied in one course in the specialty "State Border Security" (two study groups) and "Telecommunications and radio engineering" (also two groups) in the period from September 2019 to May 2020. Cadets of this group studied mainly using conventional and traditional means of teaching in classrooms. Regarding academic disciplines, the study took into account the results of training in the disciplines "Engineering Support of Border Protection", "Border Control" and "English for professional needs". These disciplines reflect the professional, special and humanitarian components of training border guard officers.

To assess the effectiveness of integrating electronic educational resources into the training of future officers, two criteria were used – cognitive and operational.

The following indicators were selected as indicators of the cognitive criterion:

- knowledge of the purpose, characteristics, features, composition of technical means of border protection in English (1.1);
- specific English terms regarding using technical means of border protection in the process of performing service duties for the state border protection in English (1.2);
- specifics of interviewing and identifying foreigners during document verification (1.3);
- knowledge of basics of professional communication in English with foreigners crossing the state border (1.4).

Indicators of the cognitive criterion were evaluated by completing test tasks and an oral survey on a four – point scale with entry in the electronic study log: "Excellent – 5" (ECTS – A), "Good – 4" (ECTS – B, C), "Satisfactory – 3" (ECTS – D, E), "Unsatisfactory – 2" (ECTS - FX).

Skills and abilities selected as indicators of the operational criterion:

- using technical means for border control (giving orders to travellers in English) (2.1);
- solution of the problem and informing a foreigner about the decision in English (2.2);
- conducting interviews and identification of travellers in English during document verification (2.3);
- professional communicative foreign language skills development (2.4).

Indicators of the operational criterion were evaluated by performing practical tasks in practical and laboratory classes on a four-point scale with recording the grades to an electronic log.

As the foreign language proficiency of the personnel of the SBGSU nowadays is assessed with the use of international testing standards, such as the NATO STANAG 6001, an additional testing of the NASBGSU cadets was organized to check the dynamics of development of professional foreign language communicative competence of EG cadets at the beginning and end of the experiment.

4. Results of Research

Comprehensive integration of electronic educational resources in order to improve the quality of development of professional English language competence of future officers has proved its effectiveness in the result of the study. This is confirmed by the results of diagnostics of academic achievements of cadets who used electronic means for professional English training. At the same time, it is recommended to adhere to a certain ratio of the share of classes using electronic educational resources and practical classes in real conditions.

The results of evaluating the average values of cognitive and operational criteria for EG and CG after conducting an experimental application of electronic educational resources to learn English are presented in the Tables 1, 2.

The average value (Kc) and the integral criterion (Ki) were calculated by the following formulas:

$$K_c = \frac{k_5 \cdot 5 + k_4 \cdot 4 + k_3 \cdot 3}{k_5 + k_4 + k_3},$$

$$K_I = \frac{k_5 + k_4 + k_3}{3}$$

where k_5, k_4, k_3, k_5 – the number of cadets who received "excellent", "good" and "satisfactory" grades, respectively.

Table 1. The results of assessing the knowledge of cadets of the control group on the indicators of cognitive and operational criteria after the experimental application of electronic educational resources and conducting practical classes (CG, n=102)

Level	Excellent		Good		Satisfactory		Average
Criteria	Quant.	%	Quant.	%	Quant.	%	
Cognitive	13	12,75	64	62,75	25	24,51	3,88
Operational	12	11,76	64	62,75	26	25,49	3,86
In total	25	16,76	128	125,50	51	50,00	
Integral	12	8,38	64	62,75	26	25,00	3,86

Table 2. The results of assessing the knowledge of cadets of the experimental group on the indicators of cognitive and operational criteria after the experimental application of electronic educational resources and practical classes (EG, n=102)

Level	Excellent		Good		Satisfactory		Average
Criteria	Quant.	%	Quant.	%	Quant.	%	
Cognitive	40	39,22	52	50,98	10	9,80	4,29
Operational	39	38,24	51	50,00	12	11,76	4,37
In total	79	77,46	103	100,98	22	21,56	
Integral	40	38,73	51	50,49	11	10,78	4,28

The results of estimating the average values of cognitive and operational criteria for EG and CG after the experimental use of electronic educational resources to learn professional English are presented in the diagrams of Figure 1.

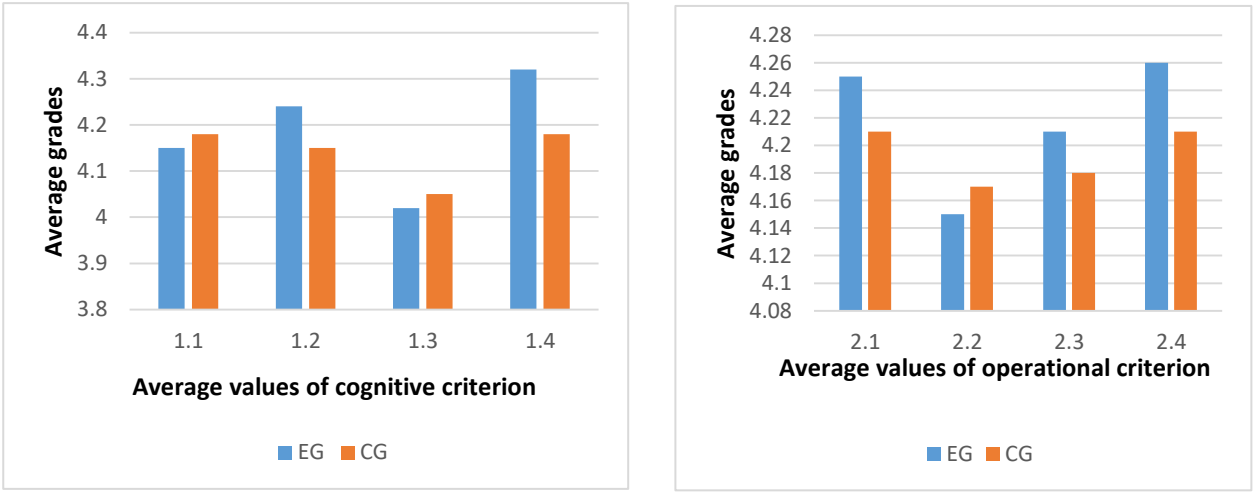

Figure 1. Charts with average values of cognitive and operational criteria indicators

The diagrams show that the factors caused by war and pandemic, such as a significant reduction in classroom learning, making adjustments to the educational process, and using distance forms of learning did not significantly affect the quality of EG cadets learning. A comparison of the average score of EG cadets and the average score of CG cadets allow us to conclude that academic performance remained at the same level that it was before the restrictions were imposed. This was made possible by the integration of electronic educational resources into the educational process.

To check the effectiveness of the e-learning course "English for Professional Needs", a test was carried out taking into account international standards for testing the level of language proficiency in accordance with the descriptors of the NATO STANAG 6001 standard (table.3).

Table 3. Language proficiency levels according to the NATO STANAG 6001 standard

Language Levels	Proficiency	
		Excellent
		5 (Native/Bilingual)
		4+ Very Good
		4 (Full Professional)
		3+ Good
		3 (Minimum Professional)
		2+
		2 Fair (Limited Working)
		1+
		1 Elementary
		0+
		0 No Practical Proficiency

Since at the beginning of the academic year (before introducing quarantine restrictions into the educational process), an initial control was carried out, which provided for the successful completion of a reading test and an oral interview with two teachers (each of whom gave their own independent assessment), the study had the opportunity to compare these data with the results obtained at the end of the academic year. In May 2021, another measurement of the level of development of professional foreign language communicative competence was carried out. The results are presented in Table 4.

Table 4. Dynamics of development of professional foreign language communicative competence of EG cadets at the beginning and end of the experiment, n=102

STANAG 6001 language proficiency levels	At the beginning of the academic year		At the end of the academic year	
	EG, n=102		EG, n=102	
	persons	%	persons	%
Level 0+	27	26.47	12	11.76
Level 1	46	45.09	35	34.31
Level 2	29	28.43	55	53.93

The number of cadets for control and experimental groups was 204 people, cadets of groups did not intersect, the assessment was conducted on a five-point scale (criteria also did not intersect). Therefore, the hypothesis on the reliability of the obtained results was tested by Pearson's criterion $\chi 2$. The results are shown in table 5.

Table 5. Calculation table for testing hypotheses about the reliability of the results obtained by the Pearson criterion $\chi 2$

The level of English according to STANAG 6001	Empirical frequency	Theoretical frequency	$(f_Э - f_Т)$	$(f_Э - f_Т)^2$	$(f_Э - f_Т)^2/f_Т$
Level 0+	27	19.5	7.5	56.25	2.885
Level 0+	12	19.5	-7.5	56.25	2.885
Level 1	46	40.5	5.5	30.25	0.747
Level 1	35	40.5	-5.5	30.25	0.747
Level 2	29	42	-13	169	4.024
Level 2	55	42	13	169	4.024
In total	204	204	-	-	**15.312**

Result: $\chi^2_{емп}$ = 15.312.

Critical values χ^2 when v=2

v	p	
	0.05	0.01
2	5.991	9.21

The differences between the two distributions can be considered significant if $\chi 2emp$ is equal to or greater than $\chi 20.05$, and more significant if $\chi 2emp$ is equal to or greater than $\chi 20.01$. Thus, our hypothesis is valid.

In the presented research the validity of the obtained results is high, as a high degree of correspondence of the results of the research process to reality is determined. All independent and dependent variables are accurately measured, no side variables affect the dependent variable, all measurements are statistically processed correctly, and conclusions are made taking into account all additional variables. The results obtained show that despite the introduction of quarantine restrictions in the educational process and due to the use of electronic educational resources among EG cadets, the number of those who reached Level 2 increased by 25.49% (53.93 %) and the number of cadets with Level 0+ decreased by 14.76% (at the beginning of the school year it was 26.47 % and at the end of the school year it became 11.76 %).

Thus, the data obtained in the study on the effectiveness of the integration of EER in the English language training of future border guard officers suggest that they have been quite effective. Despite the introduction of the restrictions to the educational process, it was possible to ensure an acceptable level of training for border guard officers.

5. Discussion

According to Didenko, Androshchuk, Maslii, Balendr & Biliavets (2020) the use of information and communication technologies to improve the professional training of future Border Guard officers during the quarantine is very efficient, due to the fact that it is impossible to use a considerable share of traditional group forms of conducting classes with cadets. To ensure the proper quality of their training, the researchers Balendr, Komarnytska, Didenko, Kalaur, Soroka, Biliavets, Khamaziuk (2023) propose to integrate into the educational process modern electronic educational resources with an English language interface that have proven their effectiveness in training military personnel in NATO member countries: the program of unified conflict simulation and tactical Simulation (JCATS-Joint conflict and Tactical

Simulation) for computer command and staff exercises; the training computer program BATTLE COMMAND for simulation modelling of exercises, training and classes in tactical (special tactical) disciplines; the tool of simulation modelling FOLLOW ME for conducting classes of tactical-special direction in order to form skills of making rational tactical decisions during combat operations at the tactical level.

For example, in order to enhance professional foreign language competence of future border guard officers, cadets worked with the JCATS tactical-level simulation system. Thanks to this program, cadets practiced their skills to assess the dynamic environment, make informed decisions and effectively command subordinate units in English. This program allowed to quickly perform training exercises (15-20 minutes), so during one classroom session there was an opportunity to analyze their actions and repeat the exercises. The program for implementing simulation modelling "Battle Command" was also used, which allowed conducting training and practical exercises in tactical disciplines in order to study the decision – making process of the platoon-company link. The JCATS and Battle Command training programs make it possible to simulate conflict situations on the ground, in the air and at sea and minimize the classroom presence of a significant number of cadets in one room, which is important in the context of the spread of the pandemic.

For the organization of remote training, text and graphic files, educational and methodological manuals, additional materials for in-depth study of topics, demonstration materials were uploaded into the departmental educational Intranet platform. It also holds a collection of textbooks on disciplines, as well as audio and video information, graphic information, and so on. Teachers in the LMS Moodle system provided students with links to websites, recommendations, and instructions for studying literature.

During experimental study, there were used various electronic means, starting from email, a calendar app, an app for creating training courses (Classroom), to applications for conducting video synchronous session – Meet and Zoom.

In order to integrate electronic educational resources into the training of cadets in the context of educational process restrictions, an electronic didactic modular environment of the discipline "Border control" was used, the components of which are the special software program "Trainer", a computer simulator for determining age-related facial changes "Wiek" and a computer test "FaceID". In the traditional educational process, where an electronic didactic modular environment is not used, for the development of these skills, a system of training, video recordings of persons passing passport control, and photos of documents of these persons were used; photos of similar or the same persons glued together, but photographed at different times. Photos of colleagues and officers taken 10-15 years ago were also used. Cadets during training had to determine age-related changes in appearance and draw a conclusion about the identity of faces. Such tools were used for self-control, as well as during intermediate or final control of cadets studying the relevant topic. The cadet had to give an answer to the question of whether it is the same person or different people. Presentations were constantly updated, new photos were added, and tasks were complicated by editing some face images using the Adobe Photoshop image editor.

At the same time in order to provide cadets with possibility to learn professionally-oriented English with the terms and expressions necessary to accomplish service duties at the international border crossing points, the electronic training course "English for Professional Needs" was developed and used in the educational process of the Academy. The course was developed by teachers of the Department of Foreign Languages to train future officers. This course has a well-defined professional-oriented nature. It contains training materials that are prepared taking into account the content and requirements of the industry framework of qualifications in the field of border protection of EU countries. The electronic training course "English for Professional Needs" is designed for using mobile learning technology (m-learning). The importance of this form of training is due to the fact that it allows cadets to improve their professional level during extracurricular hours using the departmental Intranet network and telecommunications technologies. This educational tool has the character of a cross-platform (it can be used on various mobile devices and common operating systems), it is integrated into the departmental learning management system (LMS-Learning Management System, English) of the SBGSU. The peculiarity of this electronic tool is that it is built on the basis of an intensive non-complex teaching methodology, which facilitates achieving the educational goal in the shortest possible time, but using the maximum possible amount of educational material. It is also important that the textbook tasks are designed in such a way that they motivate cadets to engage in communicative interaction. In addition, the introduction of the educational electronic tool "English for Professional Needs" contributes to improving the methodological competence of teachers, and to the implementation of a flexible learning trajectory, student autonomy, and provides facilitation and support from teachers in the educational environment. The developers of the electronic tool "English for professional needs" took into account the requirements of European border agencies regarding the level of training of personnel. An example of a textbook page is shown in Fig. 2.

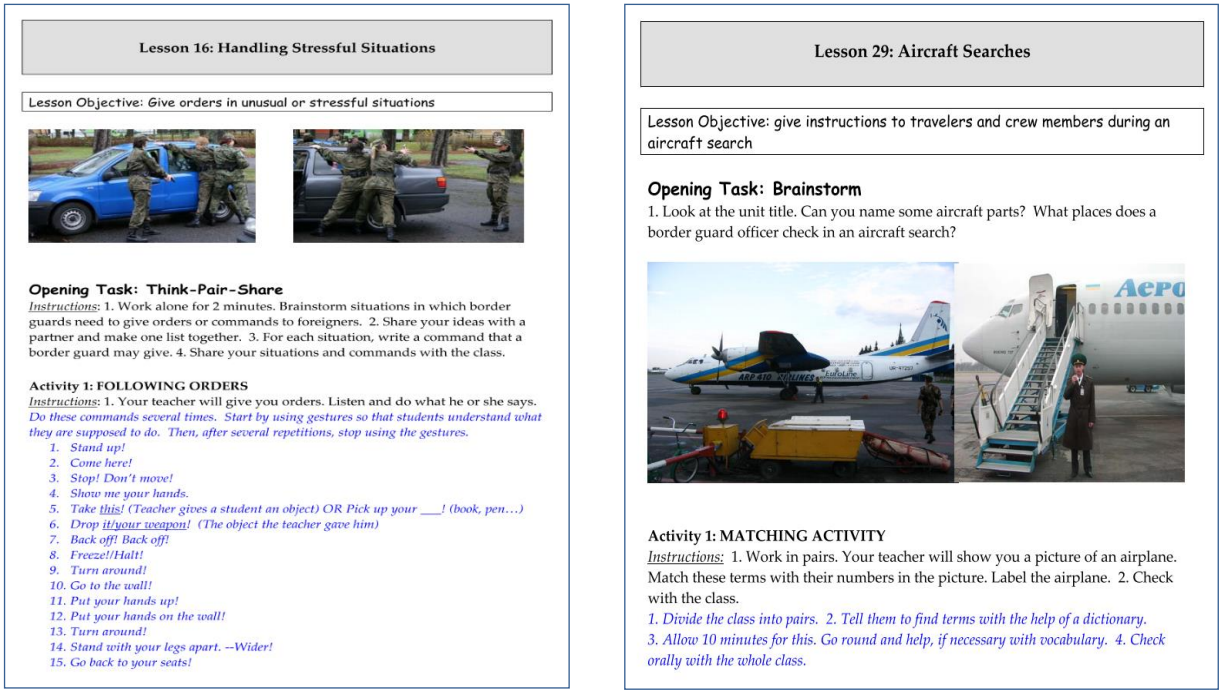

Figure 2. The page of the e-learning course "English for Professional Needs"

6. Conclusion

The data obtained in the study on the effectiveness of integrating EER into the foreign language training of future border guard officers in the context of educational process restrictions indicate that their usage was quite effective. Despite the restrictions caused by the war imposed by Russian federation and COVID-19 pandemic, it was possible to enhance professional English for future officers of border guard units. To test the effectiveness of integrating electronic educational resources into the foreign languages training of future officers, four training groups of the National Academy of the State Border Guard Service were involved, who studied in one course in the specialty "State Border Security" and "Telecommunications and Radio Engineering" in the period from September 2020 to May 2021. Training in the experimental group was carried out with the maximum possible application of electronic educational resources.

The study took into account the results of training in the disciplines "Border Control" and "English for professional needs". These disciplines reflect the professional, special and humanitarian components of training border guard officers. To assess the effectiveness of integrating electronic educational resources into the foreign languages training of future officers, two criteria were used – cognitive and operational. In order to integrate electronic educational resources into the training of cadets of border guard specialties in the context of restrictions, an electronic didactic modular environment of the discipline "Border control" was used, the components of which are the special software program "Trainer", a computer simulator for determining age-related facial changes "Wiek" and a computer test "FaceID". A comparison of the average score of experimental group cadets and the average score of control group cadets allowed to conclude that academic performance remained at the level that it was before the educational process restrictions were imposed at the academy. This was made possible by the integration of electronic educational resources into the educational process.

To check the effectiveness of the e-learning course "English for Professional Needs", a test was carried out taking into account international standards for testing the level of language proficiency in accordance with the descriptors of the NATO STANAG 6001 standard. The results obtained showed that despite the introduction of quarantine restrictions in the educational process and due to the use of electronic educational resources among EG cadets, the number of those who reached Level 2 increased by 25.49% (53.93 %) and the number of cadets with Level 0+ decreased by 14.76%.

The results of the study give us grounds to state that comprehensive integration of electronic educational resources in order to improve the quality of formation of professional knowledge, skills and abilities by future officers has proved its effectiveness in the context of a pandemic. This is confirmed by the results of diagnostics of academic achievements of cadets who used electronic means for professional training. At the same time, experts recommend adhering to a certain ratio of the share of classes using electronic educational resources and practical classes in real conditions.

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