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USE OF AN E-TEXTBOOK FOR PRE-SERVICE TEACHERS IN AUTONOMOUS LEARNING OF ENGLISH FOR SPECIFIC PURPOSES

Abstract. The research reveals the advantages of using an e-textbook in autonomous learning of the discipline “Foreign Language for Professional Communication (English)” by pre-service teachers of mathematics. The article presents the method of application of the ESP (English for specific purposes) e-textbook “Mathematics”, its structure, and functions. The ESP e-textbook includes learning material of three different levels of language proficiency. Each part contains professional vocabulary and speech situations aimed at forming the necessary skills and abilities in the mathematical field. The authors describe the stages of work with the learning material within a unit of the ESP e-textbook. The necessity of introduction of ESP e-textbooks in the process of learning a foreign language by pre-service teachers of mathematics is justified. The benefits of using the ESP e-textbook by students for autonomous learning are elucidated and new opportunities for an ESP teacher to structure foreign language classes are outlined in the research. Experimental training with the use of the ESP e-textbook is conducted among pre-service teachers of mathematics at Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University (Ukraine), where the ESP e-textbook is considered as an element of the learning environment for professional creative activity and accumulation of knowledge in the conditions of autonomous learning. The study presents and analyzes the results of students’ English proficiency tests, and the survey on the students’ attitude to the use of ESP e-textbooks in the process of autonomous learning of ESP. The analysis of students’ surveys shows the effectiveness and expediency of using the e-textbook by pre-service teachers of mathematics in autonomous learning of English for professional

communication. In the paper, some samples of educational activities from the ESP e-textbook “Mathematics” are presented.

Keywords: autonomous learning; English for specific purposes; ESP e-textbook; pre-service teachers of mathematics.

1. INTRODUCTION

The problem statement. The creation and implementation of e-textbooks in the educational process can provide an access to education for all social groups, increase the digital competence of all participants in the educational process, and offer high-quality content for lifelong learning. It is worth keeping in mind that an e-textbook is not only a means of educational purposes but also a full-fledged component of the distance educational environment, in which an educator and a student are participants of the educational process. From this point of view, an e-textbook can be considered as a distance educational environment, a tool for professional creativity and accumulation of knowledge, and a source of cognitive information.

The methods of applying educational information technologies depend on many factors and are determined by specific learning conditions: configuration and capabilities of available computer and telecommunication equipment, available software, teacher qualifications, etc. An information system implemented in the educational process has a great impact on teaching foreign languages to pre-service teachers. It contributes to a foreign language environment, which is one of the main motivating and stimulating factors in the process of autonomous learning of foreign languages for specific purposes.

Analysis of recent research and publications. At present, the issue of optimal implementation of e-textbooks in the educational process of higher education institutions is becoming relevant. Considerable attention is paid to the study of the characteristic features, functions and place of e-textbooks in the educational process, the principles of their creation, requirements and criteria for their assessment.

The use of e-textbooks is of special interest to many researchers, in particular Y. Abutaleb, M. Bamkin, V. Bykov, J. Casey, A. Conyers, P. Dalton, R. Gurevych, H. Jones, Y. Kang, J. Lambert, R. Lin, M. Wang, L. Wong and others. The studies conducted by universities and research centers have demonstrated the importance, growing use and continuous implementation of e-textbooks in academic and research fields [1]. For example, Abutaleb [2] noted that one of the requirements of some universities, such as the University of California, Berkeley, the University of Minnesota and others, is the use of e-textbooks for specific learning courses. Kang, Wang and Lin [3] confirmed that e-textbooks are one of the new products of information technologies in educational institutions, and Casey [4] found that e-textbooks can link different types of information presentation, such as reading with printed text, images with sound and the use of subtitles in the video. Such e-textbooks also offer flexibility, allowing students to set the speed of speech, choose available reading techniques or choose the language that is provided in written and oral form. Several recent studies [5] – [10] argue that students are ambivalent about the implementation of e-textbooks in the educational process.

According to Bruillard [11], e-textbooks have three advantages for students: physical, academic, and psychological [12]. The physical advantage is that students are not forced to carry a large number of textbooks – they are replaced by one device [13] – [16]; the academic advantage is expressed in the improvement of students’ academic achievements due to their greater involvement in the process of acquiring knowledge, attractive functions and interface

[17] – [19]; the psychological advantage of e-textbooks is that they increase the level of students' motivation and creativity [20], [21].

E-textbooks create new opportunities for teachers to arrange and structure their lessons. Comparing lessons with e-textbooks and traditional ones, scholars have concluded that the former have advantages in: providing a logical lesson; clarity of visual and graphic elements; increasing students' motivation and interest [12, p. 125].

The analysis of educational and methodological literature points to the contradiction between the growing requirements for the foreign language level of pre-service teachers and pre-service teachers' actual level of knowledge, difficulties in using a foreign language in professional activities. At the same time, the analysis of development and use of e-textbooks in the educational process of higher education institutions shows that, despite their positive impact on the content, organization and methods of teaching, educators do not often use them. The current situation with the use of e-textbooks for teaching ESP needs to be improved. There is obviously a demand for new e-textbooks for pre-service teachers of non-linguistic specialties and the need to increase the efficiency of such e-textbooks.

Teaching a foreign language for specific purposes differs considerably from teaching a foreign language as a major subject. In this case, a foreign language is taught as a language of professional communication, which combines the knowledge of the language and the major specialty. In this regard, it is necessary to pay close attention to the selection of content and methods of teaching a foreign language. It is also important to take into account the specifics of the institution, as well as educational technologies and forms of teacher-student interaction [22].

Contemporary studies highlight learning and communication strategies that focus on effective mastering a foreign language. The integral part of these strategies is an e-textbook, which can help students control their learning, improve communication skills, develop problem solving abilities, thereby increasing confidence and motivation to learn the language. The priority for the educator is to select appropriate learning methods and strategies, to teach students to use them properly in order to increase their level of autonomy and organization in learning a foreign language [23] – [26].

The analysis of a certain number of English textbooks and manuals for students majoring in Mathematics [27] – [29] shows that they do not meet the requirements for new generation textbooks aimed at improving English skills in accordance with professional interests of students and do not ensure student autonomy [23, p. 50]. The main disadvantages of the textbooks are their focus on the development of mainly reading skills, as well as the focus on learning with the constant guidance of the educator. They lack multi-level exercises, problem-based tasks and situations that would contribute to the conscious formation of students' autonomous individual educational trajectory, which is considered as a prerequisite for successful mastering a foreign language.

The current methodological trends in teaching English for professional communication are rather successful in the formation of students' professionally oriented foreign language communicative competency due to autonomous learning of English, which provides greater freedom of action in developing learning communicative activities and at the same time greater student responsibility.

The purpose of the study is to present the results of implementation of an ESP e-textbook for pre-service teachers of mathematics under the conditions of autonomous learning. The study hypothesizes that the created e-textbook demonstrates new opportunities for developing an autonomous educational trajectory for pre-service teachers majoring in Mathematics in achieving the B2 level of English language proficiency.

2. METHODOLOGY

In order to overcome the contradiction between the need to implement a personality-oriented approach in the training of pre-service teachers of mathematics and the lack of methods for forming autonomous individual educational trajectories of professional self-improvement, we created an e-textbook for the discipline “Foreign Language for Professional Communication (English)” for students majoring in Mathematics, which demonstrates the enhancement of opportunities for the use of the information and communication technologies in the study of professionally-oriented foreign language communication. The overall aim of the course “Foreign Language for Professional Communication” for pre-service teachers of mathematics is to prepare the students for effective foreign language communication in their academic and professional environment, which involves communication related to the future profession.

The ESP e-textbook can be used in the classroom, students’ extracurricular, individual and autonomous work, as well as in distance learning. The created ESP e-textbook “Mathematics” provides the acquisition of practical knowledge, skills and abilities in English for professional communication.

The created e-textbook is presented on the website of Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University, at the section “Distance Learning” (on the online learning platform Moodle). Only the registered users of the platform (students of the Faculty of Mathematics, Physics and Computer Sciences) have access to the e-textbook. The detailed description with the screenshots of the e-textbook pages is given in our monograph [23, p. 211].

The structure of the ESP e-textbook: the learning materials of the ESP e-textbook are divided into three parts of different levels and correspond to A2, B1, and B2 language proficiency. Each section contains professional vocabulary and speech situations aimed at forming the necessary skills and abilities in the mathematical field.

The stages of work with the ESP e-textbook: When the computer program starts, the user sees the front page with four *Menu tabs*. The instructions for the program are included in the *Menu tab Help*. After reading the instructions, which are written in Ukrainian, the user can confidently proceed to the tasks. The *Menu tab Information* contains information about the authors.

The second page of the program *Unit* offers to choose one of the listed topics. The user can go through only one topic of this program at a time. By selecting one of the topics (from the *Unit* page), the user automatically switches to a parallel subprogram, which opens automatically when you click on one of the topics.

The process of transition expects clicking on the first topic “Word Processing: Uses”. The user is presented with a subprogram that has all the properties of the Windows. This subprogram contains five *Menu tabs*. The figure shows that the user is on the *Text* menu tab (Fig. 1). This page contains the text in English, which is the basis for the next three tasks.

It should be noted that the text is written in the *Memo* component and has the function of copying the text. That is, if the user does not understand the text completely, this feature allows the user to copy and translate an unknown word in any translator. This feature helps students to save time working with the text.

In addition, some words in the texts are highlighted in bold. By clicking on any selected word, a message window automatically appears with the translation of this word. There are usually nine or ten such words in the text. The authors tried to make the software product as convenient as possible to use and learn new English terms, that is, if a text contains about fifty words, nine of which are unknown, the user can intuitively guess their meaning.

If the user clicks on *Play Audio* icon, the audio recording starts automatically. The user can see the text on the screen and listen to it presented by a nativespeaker. Listening to the text is aimed at developing the skills of phonemic listening and pronunciation.

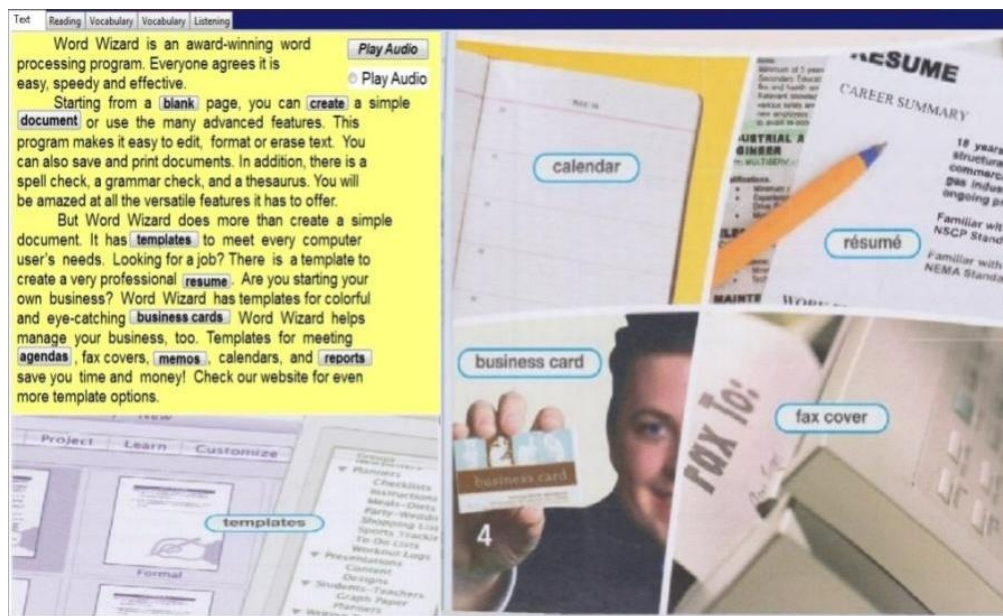


Figure 1. Example of the “Text” menu tab

Proceeding to the *Reading* menu tab, the user is offered to do three tests, such as a test of alternative choice, a multiple choice test and a test on matching (Fig. 2, 3, 4). The purpose of these tasks is to control reading and listening comprehension of the text. Another feature is that the user can go through the task simultaneously listening to the audio recording. So, when the user chooses, in their opinion, the correct answers, they can check their result by clicking on the *Result* button: the user can see a message window, which shows the score. Also, the message provides the information about the maximum score that the user could get.

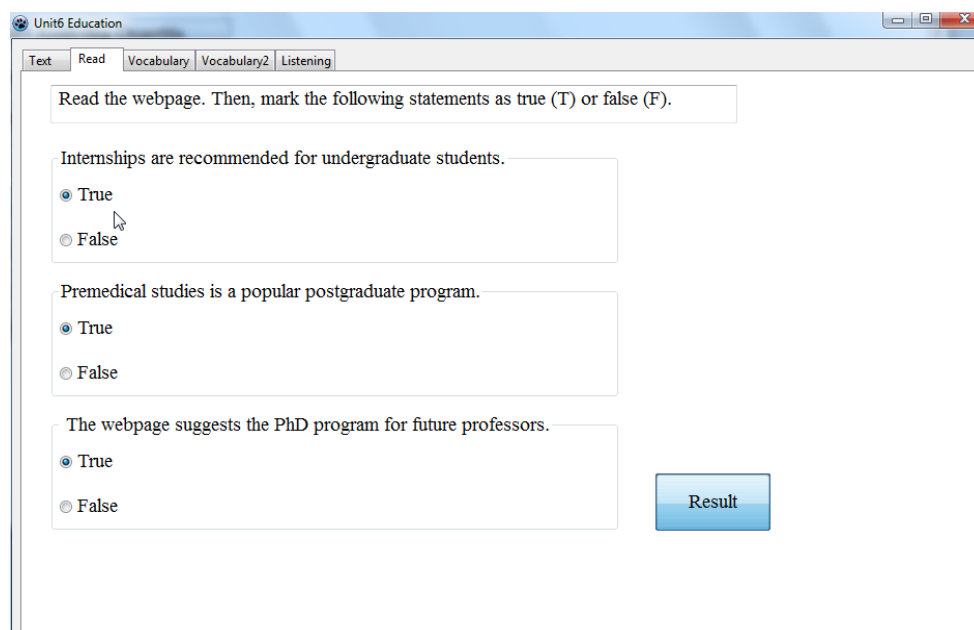


Figure 2. Example of an alternative choice task

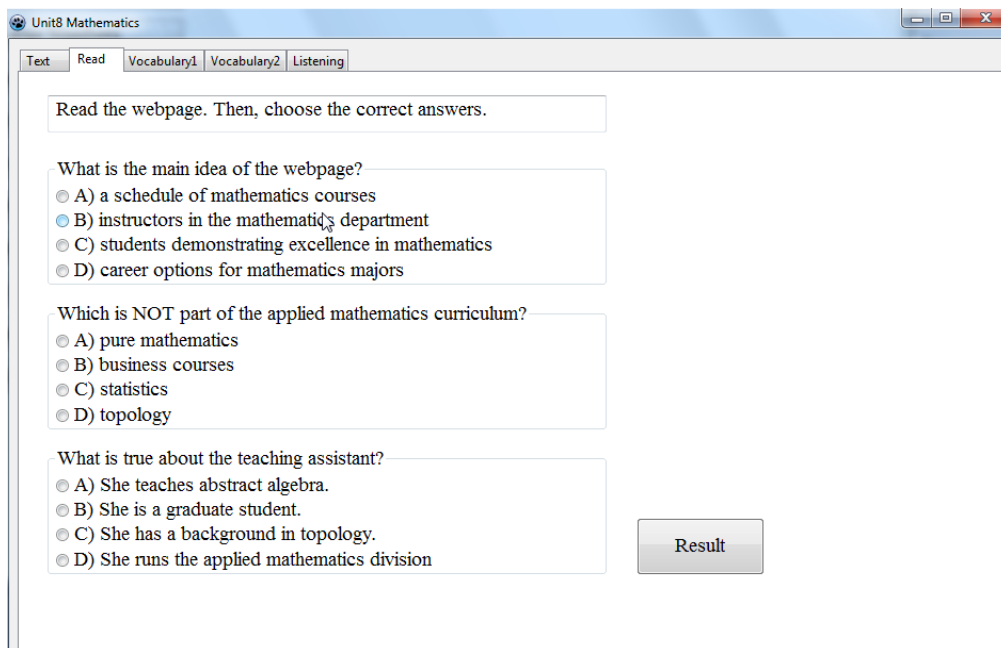


Figure 3. Example of a multiple choice task

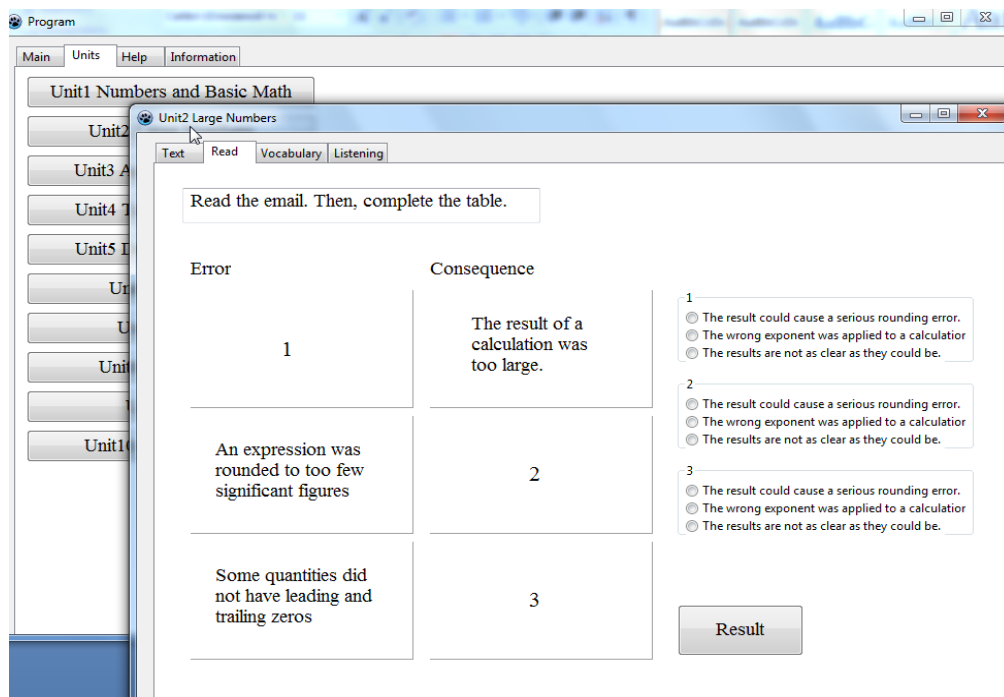


Figure 4. Example of the task on matching

The next Menu tab is *Vocabulary* (this part of the tasks is located on two menu items). It provides tests of cross, alternative or multiple choices (Fig. 5, 6). They involve memorizing English terms. The purpose of these tasks is to develop active vocabulary skills. Having a close look at these tasks, you can see that the answer options for the six tasks are the same, the user only has to choose the correct answer, realizing that several tasks cannot have the same answer.

When the user chooses an answer, they can check the number of correct answers in this task by clicking on the *Result* button (Fig. 6).

Unit8 Mathematics

Text Read Vocabulary1 Vocabulary2 Listening

Match the words or phrases (1-6) with the definitions (A-F).

A) any branch of math that serves a direct, practical purpose

- topology
- arithmetic
- abstract algebra
- pure mathematics
- applied mathematics
- non-Euclidean algebra geometry

B) a branch of math including basic operations and number forms

- topology
- arithmetic
- abstract algebra
- pure mathematics
- applied mathematics
- non-Euclidean algebra geometry

C) a branch of math dealing with properties of continuous surfaces

- topology
- arithmetic
- abstract algebra
- pure mathematics
- applied mathematics
- non-Euclidean algebra geometry

D) a branch of math dealing with properties of curved space

- topology
- arithmetic
- abstract algebra
- pure mathematics
- applied mathematics
- non-Euclidean algebra geometry

E) a branch of math dealing with theoretical structures

- topology
- arithmetic
- abstract algebra
- pure mathematics
- applied mathematics
- non-Euclidean algebra geometry

F) a branch of math focused on general ideas rather than applications

- topology
- arithmetic
- abstract algebra
- pure mathematics
- applied mathematics
- non-Euclidean algebra geometry

Result

Figure 5. Example of multiple choice tasks

Unit8 Mathematics

Text Read Vocabulary1 Vocabulary2 Listening

Read the sentences and choose the correct words or phrases.

Euclidean geometry/non-Euclidean geometry deals with principles of flat planes.

- Euclidean geometry
- non-Euclidean geometry

Rate of change is a major subject in topology/calculus.

- topology
- calculus

To determine the likelihood of an event

- pure mathematics
- probability

The shape of the Earth is the basis for

- abstract algebra
- geodesy

Students are usually introduced to the concept of variables in elementary algebra/arithmetic.

- elementary algebra
- arithmetic

The major principles in applied mathematics/ trigonometry are derived from properties of triangles.

- applied mathematics
- trigonometry

Information

Total Score 4 of 6

OK

Result

Figure 6. Example of alternative choice tasks

Going to the *Listening* tab, the user sees a dialogue that they can listen to by clicking on the *Audio* button (Fig. 7). Next, the user is asked to do multiple-choice tasks that are based on the text. The aim of these tasks is to assess the understanding of dialogic speech.

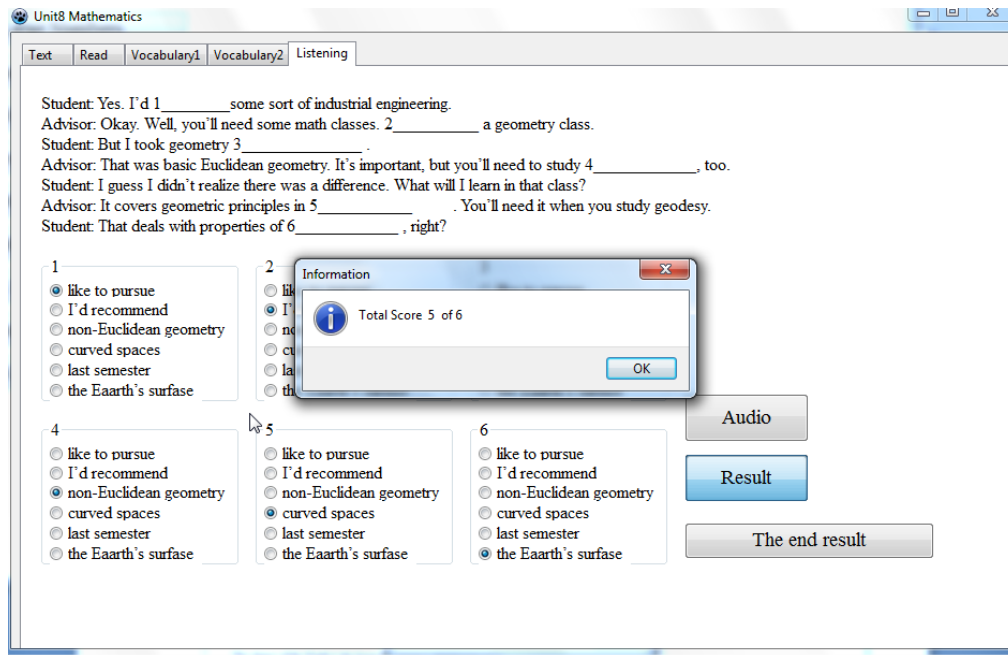


Figure 7. Example of automatic calculation of correct answers

Having chosen the correct answers, the user can check their result by clicking on the *Result* button. Also, after completing the task, the user can find out the final result of the tasks by clicking on the button *The End Result*.

The procedure of experimental training: the ESP e-textbook “Mathematics” was used in autonomous work in the course “Foreign Language for Professional Communication” by students of the experimental group alongside other learning materials. At the beginning and at the end of an academic semester, the students of the experimental and control groups were given English proficiency tests with the aim to define their level of English communication skills. After the experimental training, the participants of the experimental group were asked to complete the survey about their perception of the ESP e-textbook.

Participants. In order to verify the possibility of using ESP e-textbooks for pre-service teachers of Mathematics, a diagnostic experimental training was held in the first semester of 2020-2021 academic year at Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University with the second-year students of specialties “Secondary Education (Mathematics)”, and “Mathematics”. 40 students participated in the experimental training while studying the course “Foreign Language for Professional Communication (English)”. The experimental training was carried out without a special selection of students, under conditions of autonomous learning within 80-minute sessions, which were conducted twice a week for 17 weeks. The participants were informed about the purpose and the structure of the study and assured that students’ names would not be used in the study result reports. The participation in the study was voluntary.

Instruments. In the study, the adapted survey of S. Al-Ali and A. Ahmed [5] “Students’ perceptions of use of e-textbooks for language learning” was used. The questionnaire consisted of 7 open questions (Have you used e-textbooks to study the foreign language this semester? What do you like about the e-textbooks you are using now? What do you dislike about the e-textbooks you are using now? If you were asked to add several functions to your e-textbooks, what would they be? Did you like to use the e-textbooks at the beginning of the semester? Do you like to use e-textbooks now? Do you use e-textbooks at home?) and 12 statements that had to be evaluated on a five-point Likert scale.

The preliminary and final English tests (PET) were given to the students to measure the initial and final level of students' communicative skills according to the course syllabus.

Data Analysis. In the instruction for the survey, the students were asked to estimate the degree of their agreement with the survey statements, assessing them from one to five points (a five-point Likert scale): 5 – means completely true (strongly positive); 4 – means usually true (positive); 3 – means sometimes true (uncertain / neutral); 2 – means not usually true (negative); 1 – means never true (strongly negative). The score range of the survey is the following: 5.00-4.51 means that the level of students' perception of the ESP e-textbook is very positive, 4.50-3.51 – positive, 3.50-2.51 – neutral, 2.50-1.51 – negative, 1.50-1.00 – very negative.

The total maximum practice test score of preliminary and final English tests (according to PET scales) is 170 (170-160 – very high level, 159-153 – high level, 152-140 – average level, 139-120 – low level, 119-102 – very low level).

3. RESULTS AND DISCUSSION

Comparison of the preliminary and final English test results showed that at the beginning of the semester the results of the experimental and control groups differed insignificantly, but at the end of the semester the students of the experimental group obtained higher scores (Table 1). At the beginning of the semester, students of both groups demonstrated a moderate level of knowledge. At the end of the semester, the students of the experimental group acquired higher scores in comparison with the results of the control group (students of the control group did not use the ESP e-textbook in the educational process) and their own results at the beginning of the semester. The students of the experimental group achieved a high level (M=154.65) of communicative skills.

Table 1

Results of Preliminary and Final English Tests

	Control Group (N=40)	Experimental Group (N=40)
Preliminary English Test	M=142.69 SD=5.44	M=141.58 SD=5.35
Final English Test	M=145.47 SD=5.59	M=154.65 SD=6.02

According to Table 1, all students completed the course “Foreign Language for Professional Communication (English)” with progress. Their results were much better at the end of the semester than they were at the beginning. At the end of the semester, the students of the experimental group achieved a higher level of communicative skills (according to PET scales) in comparison with the moderate level of the control group.

After the experimental training, the participants of the experimental group were asked to respond to the survey modified from the survey “Students' perceptions of use of e-textbooks for language learning” [5]. In the study, the reliability coefficient (Cronbach Alpha) value for the adapted survey was calculated to estimate the internal consistency. It was found to be quite high: 0.8325.

57% of the surveyed students said that they had never used e-textbooks in the foreign language learning before the experimental training. Among the advantages of the e-textbook “Mathematics” students singled out: professional orientation of educational material, easy use, the ability to use a hyperlink and vocabulary, the ability to follow the text while listening, the ability to get grades for lexical tasks, the ability to return to uncompleted tasks. The disadvantages include the fact that the e-textbook is designed for a computer (laptop) and

does not have a user-friendly interface for a mobile phone, as well as the fact that the e-textbook is designed to be studied only for one semester. Among the functions that students think could be added are: increasing hyperlinks, more exercises to develop writing skills, grammar exercises. 85% of the students said they had some fear of using the e-textbook at the beginning of the semester, but at the end of the semester 98% of the participants claimed they liked using the e-textbook in autonomous learning of ESP.

Table 2 shows the mean scores, standard deviation and interpretation of the results of the survey which was completed by 40 pre-service teachers of Mathematics.

Table 2

Mean Scores and Standard Deviation of the Students' Perceptions in Using the ESP E-textbook

Statements	M	SD	Interpretation
Electronic textbooks are more useful than printed books.	4.43	0.62	positive
I like to use electronic textbooks to learn English.	4.88	0.32	very positive
The e-textbook encouraged me to study more at home on my own.	4.79	0.41	very positive
My teacher explained to me how I could use the e-textbook.	4.85	0.24	very positive
Electronic textbooks are convenient for anyone.	4.79	0.39	very positive
Using the e-textbook in my class helped me learn better.	4.68	0.54	very positive
The e-textbook helped me improve my speaking skills.	4.41	0.58	positive
The e-textbook has helped me improve my reading skills.	4.71	0.34	very positive
The e-textbook has helped me improve my listening skills.	4.62	0.42	very positive
The e-textbook has helped me improve my writing skills.	4.38	0.45	positive
I'm happy with how the e-textbook is used in autonomous learning of ESP.	4.39	0.40	positive
My teacher uses the e-textbook for the benefit of students.	4.67	0.32	very positive
<i>Average</i>	<i>4.63</i>	<i>0.42</i>	<i>very positive</i>

Table 2 shows the results of the statistical analysis of the survey statements. In general, the students have very positive perceptions in using the ESP e-textbook ($M=4.63$). The most significant mean value among the twelve items of the survey is that the students like to use the ESP e-textbooks in the educational process ($M=4.88$). The data on the categories do not vary substantially.

As it is shown in Table 2, most values of standard deviation (SD) lie in the range 0.24-0.62. It signifies that the data points tend to be close to the mean of the set, i.e. the answers are more or less homogeneous. The results suggest that implementation of ESP e-textbooks is helpful in defining the level of English proficiency of pre-service teachers of mathematics.

It has been found that learning with the help of e-textbook technology is more interesting and more attractive to most students than using traditional textbooks because students can analyze and feed in data keeping their own pace, share personal experience in the educational process. The created e-textbook is effective and encouraging for autonomous learning, combining such teaching methods and techniques as group tasks, research projects, solving situational problems, discussions, creating mind maps, etc. All these techniques increase students' activity and creativity, and teach them to analyze information

independently. The available links on each topic for further study enrich students' knowledge and promote personal interest in the learning materials, as confirmed by studies by McGowan, Stephens and West [30] and Liber and Rosaare [31], and proper structure and construction ensure the effectiveness of the e-textbook, as its interactive elements save students from monotonous texts and reveal the topic from different perspectives [32].

The advantage of the e-textbook is that it helps students to master the educational material; encourages active reading, listening, making notes of the text and choosing the main points. The results of the survey are consistent with the opinion of Kobola [33] that a multimedia textbook "simultaneously uses different sensory sensations, thus ensuring greater involvement of students in activities during the lesson, strengthens emotions and interest, activates inductive thinking and promotes the involvement of all mental functions". Another advantage of using the e-textbook, in our opinion, is that it allows the teacher to assess students' responses quickly and objectively, which is an important means of motivating. The analysis of students' answers confirms the opinion of Laketa and Drakulić [12, p. 123] that e-textbooks contribute to the formation of practical skills and techniques, because, in addition to subject knowledge, students actively use the ability to use the latest technologies.

As the size of the sample is rather small ($n=40$), the survey results cannot exemplify the entire student population. Rather, this study should be considered as an exploratory investigation that has the goal of identifying possible issues and trends for further research.

4. CONCLUSIONS

The results of the study prove the effectiveness of the ESP e-textbook "Mathematics" designed for students majoring in "Secondary Education (Mathematics)" and "Mathematics" in achieving the B2 level of English language proficiency in terms of autonomous learning.

According to the data of the experimental training, the e-textbook individualizes and differentiates the educational process: it allows educators to customize lessons for each student. Students gradually advance through the course units, using their own pace and rhythm. They can develop their learning strategy, independently choose learning topics and forms, and get feedback. The e-textbook identifies the causes of mistakes and displays appropriate explanations and comments. The implementation of self-control and self-correction of the process of mastering the educational material, computer visualization of the educational information, illustrations, video and sound elements stimulate students to practice the learning material systematically, develop the skills required to make optimal decisions, choose options for solving problem situations.

The survey shows positive attitude of pre-service teachers of Mathematics to the described ESP e-textbook in autonomous learning of ESP.

Thus, the created e-textbook helps to provide the organization, management and control of autonomous learning of professionally oriented English communication by pre-service teachers of mathematics and gives the possibility:

- to form a professionally oriented English communicative competency in receptive and productive types of speech activity;
- to diversify the educational process technologically, which has a positive impact on the motivation of pre-service teachers of mathematics;
- to take into account the level of foreign language proficiency;
- to intensify the autonomous learning.

In terms of the prospects for further research we intend to determine the pedagogical conditions for mastering English language proficiency of pre-service teachers within the framework of ubiquitous learning.

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ВИКОРИСТАННЯ ЕЛЕКТРОННОГО ПІДРУЧНИКА МАЙБУТНІМИ ВЧИТЕЛЯМИ ПІД ЧАС АВТОНОМНОГО НАВЧАННЯ АНГЛІЙСЬКОЇ МОВИ ДЛЯ ПРОФЕСІЙНОГО СПІЛКУВАННЯ

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Анотація. Дослідження розкриває переваги використання електронного підручника під час автономного вивчення дисципліни «Іноземна мова для професійного спілкування (англійська)» майбутніми вчителями математики. У статті представлено методику застосування електронного підручника «Математика», його структуру та функції. В електронному підручнику навчальний матеріал укладено за трьома рівнями володіння іноземною мовою. Кожна частина містить професійну лексику та мовленнєві ситуації, спрямовані на формування необхідних умінь і навичок з математичної галузі. У дослідженні описано етапи роботи з навчальним англійським матеріалом у межах розділу електронного підручника. Обґрунтовано необхідність упровадження електронних підручників під час вивчення англійської мови для професійного спілкування майбутніми вчителями математики, з'ясовано переваги використання електронного підручника майбутніми педагогами математичної галузі для автономного навчання та окреслено нові можливості для викладача структурувати заняття з іноземної мови. Експериментальне навчання з використанням електронного підручника під час вивчення англійської мови для професійного спілкування здійснювалось серед майбутніх учителів математики у Вінницькому державному педагогічному університеті імені Михайла Коцюбинського (Україна), де електронний підручник розглядається як елемент навчального середовища для професійної творчої діяльності та накопичення знань в умовах автономного навчання у ЗВО. У дослідженні представлено та проаналізовано результати тестів на знання англійської мови студентами, а також опитування щодо ставлення студентів до використання електронних підручників під час автономного навчання англійської мови для професійного спілкування. Аналіз опитувань студентів свідчить про ефективність та доцільність використання електронного підручника майбутніми вчителями математики під час автономного вивчення англійської мови для професійного спілкування. У роботі наведено приклади завдань з електронного підручника «Математика» для навчання англійської мови для професійного спілкування.

Ключові слова: автономне навчання; англійська мова для професійного спілкування; електронний підручник; майбутні вчителі математики.

