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Addressing Specific Vocabulary Challenges through Online Platforms and Internet Channels

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Abstract

Currently, the utilization of information and communications technologies in the educational sphere is experiencing a rapid increase in popularity, in particular, in teaching foreign languages. The use of information and communication technologies (ICT) has become an integral part of the educational process. However, modern technologies should optimize classes, and not be a hindrance in achieving the planned goals. The aim of this paper is to investigate whether the use of educational online platforms can effectively assist in the development of students' lexical skills. Having a number of advantages, web platforms are able to optimize the learning process at the stages of vocabulary semantics, word processing, vocabulary practice and vocabulary output into speech. The article presents a brief description of open online resources and web platforms for the development of lexical tasks and exercises, suggests possible options for working with these resources in the classroom, which can help teachers who want to keep up to date and develop their professional skills. The results of a study on the use of online platforms for enhancing students' vocabulary skills are also reported.

Keywords: communicative competence, computer linguodidactics, development of lexical skills, ICT, information and communication technologies.

1. Introduction

The study program in a technical university is built in such a way that the study of professionally oriented vocabulary at the lessons of foreign languages occurs earlier than the study of core disciplines by students. "There is a demand for specialists capable to integrate successfully the international professional community" (Varlakova et al., 2023), however, future specialists

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often find it difficult to apply the studied foreign language professionally oriented vocabulary in practice during foreign language professional communication because at this stage of their studies, they have not yet developed a clear vision of their future professional activities.

As a result, teaching English for specific purposes, including the use of professionally oriented vocabulary in particular, can largely be limited to the reading and translation of professionally oriented texts. In this respect, the necessity to find new resources and materials for teaching a foreign language that can tackle at least two problems: 1) the utilization of the latest technological resources that keep pace with modern scientific and technological developments, and 2) the enhancement of student motivation to learn a foreign language in order to pursue their future profession.

Nowadays, computer linguodidactics has become widespread, and with the availability of access to the global network at almost every home and practically in each smartphone the process of using network technologies in language learning is greatly simplified. Access to the Internet provides a wide range of opportunities for learning: search for information on the web, access to authentic materials (literature, audio and video files), the ability to communicate directly with native speakers. Having a number of advantages, such as, for example, individual approach, convenience, mobility, network technologies in training are an inexhaustible source of knowledge that is freely available. "Technologies have effected every aspect of our lives and replaced many traditional functions in order to make people lives easier and more comfortable" (Dreimane, Upenieks, 2022: 1938). "Integrating technology into education provides students with an engaging learning experience, allowing them to remain more interested in the subject without being distracted" (Haleem et al., 2022: 276).

There is a huge number of online platforms for effective teaching of general vocabulary, but not every platform is suitable for teaching professional vocabulary. In the selection process, one of the most productive Internet resources, in our opinion, turned out to be such platforms as "VAcademia", YouTube and "Vkontakte".

The virtual reality platform "VAcademia" (https://vacademia.com) is mainly used in Russia to create virtual worlds. This platform has its own in-house developed software, which provides convenience. As a consequence, a wide variety of additional features can be incorporated into the virtual environment. These include a voting system, desktop access, conference calls, and the capability to record events in three-dimensional format. Virtual tools and devices such as virtual classrooms, virtual meeting rooms, and virtual conference rooms are used to provide a fully immersive virtual learning experience. This virtual learning environment can be utilized to host virtual conferences, workshops, and lectures, as well as other educational activities.

One more platform which can be easily used thanks to its simplicity is the third most visited site in the world – YouTube. On this popular video hosting platform, users with varying levels of proficiency may find dedicated online language-learning channels. These channels can be divided into two types: lectures and video lessons.

Lectures are foreign language speeches on a particular topic made by an expert in the specific field. They require more preparation as these speeches should harmoniously unite all aspects of speech.

Video lessons include all stages of the lesson, adopted in pedagogical science and are held by a native speaker. In each lesson lexical and grammatical units on the topic are introduced, afterwards examples of the use of these units in context are given.

The social network "VKontakte" was chosen as the platform for the experiment to integrate social networks into the educational process. The social network "VKontakte" occupies a leading position in Runet. According to official data, the site has more than 200 million registered users, more than 46 million of whom visit the site every day; about 2.5 billion pages are opened daily. Students spend a significant portion of their free time in front of their computers. The popularization of "VKontakte" means that a user's personal page is almost always in a browser tab, and sometimes it is the home page. This allows the users to have constant access to the information provided on the resource, and it gives access to the necessary educational materials, both in distance learning courses and in full-time education. "VKontakte" can be used for not only entertainment purposes, but also for educational and informational purposes, serving as an effective platform for implementing educational activities. It is worth noting that, for users of the VKontakte network, the interface is straightforward and user-friendly, with a simple structure and organized content that is easy to navigate and use.

The Internet platforms contain authentic video materials which not only enhance students' independence, but also significantly support the teaching process for teachers. The researchers in this study have examined the utilization of educational web platforms and assessed their effectiveness in vocabulary instruction. Therefore, the goal of this research is to investigate whether the utilization of online educational platforms can effectively contribute to the enhancement of lexical abilities among students.

Theoretical Background

In the late 20th and early 21st centuries, scientists such as E.S. Polat (2002) and M.A. Bovtenko (2005) began to investigate the potential of information and communications technologies for teaching foreign languages. As a result, computer-based linguodidactic methods began to emerge in the educational process.

It should be noted that the concept of "linguodidactics" was first introduced by N.M. Shansky in 1969. The scientist defined this notion as "the study of general patterns of language learning, the specific content, methods and means of teaching a particular language depending on didactic goals, objectives and the nature of the material being studied, the conditions of monolingualism or bilingualism, the stage of learning and intellectual and speech development of students" (Shansky, 1969).

In its turn, the term "computer linguodidactics" appeared only in 1991 thanks to K.R. Piotrovskaya, who defined the science as "the field of linguodidactics, which studies the theory and practice of using computer and network technologies in language teaching" (1991) (Piotrovskaya, 1991).

In the new reality, distance learning via the internet has become an integral part of the education process. The COVID-19 pandemic has accelerated the transition towards online learning and the utilization of all available educational means (Valieva et al., 2021). "It is prudent to develop electronic learning materials and environments at the institutional level" (Gerasimova et al., 2022: 52). Numerous researchers have conducted studies regarding online learning and digital technologies (Williamson et al., 2020; Shohel et al., 2021; Karimian et al., 2021).

For instance, W. Wargadinata et al. study the use of such applications as "Whatsapp", "Zoom" and "Google Classroom" in the process of education (Wargadinata et al., 2020). J. Keengwe and M. Bhargava examine the application of mobile technologies (Keengwe, Bhargava, 2014).

"It is necessary to have an in-depth knowledge of the search for and implementation of the advanced technologies" (Litvinenko et al., 2020: 435). Due to the fact that "mineral resource complex is one of the factors of sustainable development of the country" (Khrustaleva et al., 2021: 417), teachers at Saint Petersburg Mining University are "closely involved in the study, development, and implementation of online learning technologies and lexical innovations" (Gagarina et al., 2022; Vinogradova et al., 2021).

O.Yu. Kharlamova et al. (2023) study "enhanced terminology acquisition during an ESP course" among the students of the Mining University. S.A. Sveshnikova et al. (2022) analyzes "the development of engineering students' motivation and independent learning skills", Y. Murzo et al. (2019, p. 143) analyze "the experience of text content development for an online course created for oil and gas professionals".

Nevertheless, the issue of using such platforms as "VAcademia", YouTube and "Vkontakte" platforms for the development of lexical skills at the technical university has not yet received serious consideration. Taking into account the extensive list of possibilities offered by the Internet, we would like to analyze and identify the advantages or disadvantages of using these online platforms in teaching foreign language professionally oriented vocabulary.

In addition to the ability "to share information anywhere and at any time, social media platforms are also a great source for networking opportunities" to start social activities and perhaps find new jobs (Zhiltsov, Maev, 2020).

2. Methodology

Research Design

The following methods were used in the research process: 1. Analysis of existing online learning platforms 2. Direct observations 3. Descriptive approach (observations, comparisons, classifications, generalizations, and interpretations) 4. Modeling 5. Statistical analysis and graphical representation. These methods were implemented using computer software, including SPSS 17.0 by IBM and Microsoft Office Excel 2017.

The Student's paired T-test was used to compare related samples, and the equality of variances was assessed using Fischer's F-test.

In our experiment, we conducted a study with second-year students in the architecture program at Saint Petersburg Mining University. We used the opportunities of online platforms mentioned above: videos from the YouTube channel "How to Architect?"; special communities, devoted to English teaching of the social network "Vkontakte" (during the experiment we also created our own community on this social network); and wide range of tools of the online platform "VAcademia".

Improving the professional knowledge, skills and abilities of architecture students can be done only with the help of specially selected audio, video and text materials, including professionally oriented vocabulary. The search, selection and use of these materials at the process of teaching professional vocabulary in English are the most important tasks to be solved during the educational process.

The content of these materials on architecture topics is a necessary condition for the formation of the students' interest in expanding their professional knowledge with the help of professionally-oriented vocabulary.

The videos from the YouTube channel "How to Architect?" were used by teachers of the Department of Foreign Languages of the Mining University to teach professionally oriented vocabulary to architecture students within the framework of the conducted experiment. This channel has been run by a professional architect Doug Patt since 2008. Today you can find hundreds of videos all about architecture there. There is an extensive play-list with a series about why buildings look like they do, videos about making portfolio, videos featuring real architectural projects, a series how to design like an architect. Here there is much video information about laws of architecture and architectural styles.

Our task was to develop tutorials for the 12 lectures on architecture included in the playlist "Understanding Architecture".

Teaching assignments included topical vocabulary, pre-watching assignments, a block of viewing assignments, and after-watching assignments.

The tasks developed were divided into thematic blocks, each devoted to one aspect related to architecture: Understanding Architecture; Architecture: form or function; Function follows form; Symmetry; Asymmetry; Proportion; Scale; Architecture and Skin; Beauty; Modern architects (Moshe Safdie and Zaha Hadid) and Building materials.

Each block of tasks consisted of the following logical parts: 1) pre-viewing, which is aimed at familiarization with the topic of the video material and preliminary elimination of linguistic difficulties before viewing the video; 2) viewing – aimed at understanding the content of the video; 3) post-viewing – involving practice of oral and verbal communication of the students in professional situations.

The pre-view exercises were designed to prepare students for the viewing experience, to establish the main concepts, introduce major lexical and grammatical units, and facilitate the understanding of the video through discussions on various topics, etc. The exercises during watching provided an understanding of the film's content, while post-viewing exercises were aimed at controlling and correcting understanding of the video and also ensuring further use of the video in other forms of work on a given topic.

"Vkontakte" is a social network, which was also used during the experiment. Firstly, the authors analyzed educational communities from "Vkontakte" containing English-language material, such as "Begin English. English for All" (https://vk.com/beginenglish_ru), "English for Teaching & Learning" (https://vk.com/englang4u), "English Every Day | Endaily" (https://vk.com/endaily), "Business English Professional" (https://vk.com/business_english_prof), "IT News in English with ElcomSoft" (https://vk.com/elcomsoftitnews). These educational communities offer educational material, links to English-language textbooks and English-Russian dictionaries, latest foreign news, video clips with interactive exercises, vocabulary and grammar practice cards, and authentic fiction. With the proper integration of social networks into the learning process, both independent and collective work of students can be varied.

For example, the community "Begin English. English for All", which has 4.5 million subscribers, contains 540 discussions about grammar, textbooks, English slang, finding a tutor, books, word memorization methods, etc., 4000 English videos and 800 articles. That is a whole community of likeminded people with similar interests and motivation to learn a foreign language. "The educational

potential of social networks makes it possible to organize an informational and educational environment that stimulates cognitive interest of students in educational activities, provides them with opportunities for further self-education and self-development" (Goltsova et al., 2022).

Then taking into account the advantages and disadvantages of already functioning groups, a new community was created. It was used as an additional educational platform to teach extracurricular reading of authentic texts, watch professional video in English and listen to specific tracks according to the students 'future major.

One more online platform, which we used during our experiment, is Russian resource "VAcademia". It provided us a wide range of tools for teaching and collaborative learning activities: interactive whiteboards, pointers, drawing tools, PowerPoint presentations, remote desktop, 3D objects, voting system, etc.

So, it was decided to use the opportunities of the described online resources both at the English lessons at the University (the YouTube channel "How to Architect?"; the tools of "VAcademia") and in extracurricular activities (the social network "Vkontakte").

The authors have developed an additional distance learning support system for English lessons, which is based on a student-centered learning approach. That is, we attempted to tailor tasks to individual needs and diversify types of independent study. For the second-year students in our experimental group, we created a community that was joined by those in the subgroup and the instructor.

In the created community, the teacher posted methodological material, for instance, examples of the texts for home reading, vocabulary, recommended video and audio files, etc.; the subgroup leader posted homework for the group; and students were able to submit their homework, listen to attached audio recordings, watch video files, ask questions. Particular emphasis was placed on developing the students' skills for independent work with the assigned material, contributing to the individual organization of work time and space.

Participants

The study was conducted at the Saint Petersburg Mining University from September 2022 to December 2022 using convenience sampling. Second-year architecture students were randomly assigned to either an experimental or control group, with each group consisting of 30 individuals.

In the experimental group, regularly used during the teaching of professionally-oriented English vocabulary were YouTube videos and other open online platforms. This included a set of tasks that were developed based on these platforms. Practically at every lesson of English they watched at least one video of the playlist "Understanding Architecture" and did pre-watching exercises, a block of viewing assignments, and after-watching tasks.

As all the classrooms of Saint Petersburg Mining University are equipped with necessary facilities, it was possible to use such instruments of "VAcademia" as pointers, drawing tools, PowerPoint presentations, remote desktop, 3D objects and voting system at the lessons.

Besides, the selected materials of already existing communities and the information from the newly organized community of the social network "Vkontakte" were used as an additional educational platform for specific vocabulary training.

In the control group, vocabulary training was carried out primarily using traditional methods, based on reading specialized texts and completing pre- and post-text tasks.

Here you can see the description of the groups.

Group "A" consisted of 30 students, aged 17 to 22, with A2-B1 language proficiency level. These students studied English as a foreign language using online learning systems.

Group "B" was expressed by 30 people, aged 17 to 22 years with the same language proficiency level. They were studying according to the traditional teaching techniques including reading and translating specific texts and doing vocabulary and grammar exercises.

3. Results and discussion
Ascertaining stage

The ascertaining stage involved a survey to identify patterns in the use of web platforms for the development of students' lexical skills during foreign language classes. The questionnaire included four sets of questions, which allowed us to determine the level of knowledge of professional vocabulary, students' motivation to use web platforms during language lessons, their frequency of using these platforms during language instruction, and their ability to produce professionally relevant oral foreign language texts. A quantitative and qualitative analysis of the

survey data revealed that 66 % of the respondents had a limited vocabulary in relation to their field of specialization, and 52 % have considerable difficulties in composing an oral text on topics related to their future profession, while all of them recognized the necessity of such texts for future professional activity. 94 % noted insufficient use of web platforms in foreign language classes, 92 % of the respondents indicated that the use of online platforms would increase their motivation for learning a foreign language. The results of this survey phase were taken into account when creating the learning materials for the next phase of the project.

Forming stage

During the second phase of the study and the formative experiment, we evaluated the initial level of students' lexical knowledge. To do so, we administered a diagnostic test to the students, which included an interview on one of the topics related to their future profession, such as: "Ten essential skills needed to be an architect", "What does architecture mean in life?", "What does architecture mean to you?", "What are the demands of being an architect?", etc.

When evaluating the oral response, we relied on a qualitative method observational method using Kim's scoring rubric (Kim, 2010): 1) professional vocabulary skills, 2) students' speaking performance, 3) grammatical competence, 4) meaningfulness.

For each criterion, students were awarded a score on a 0-5 scale, with 0 indicating the absence of a developed skill and 5 signifying excellent mastery of that skill.
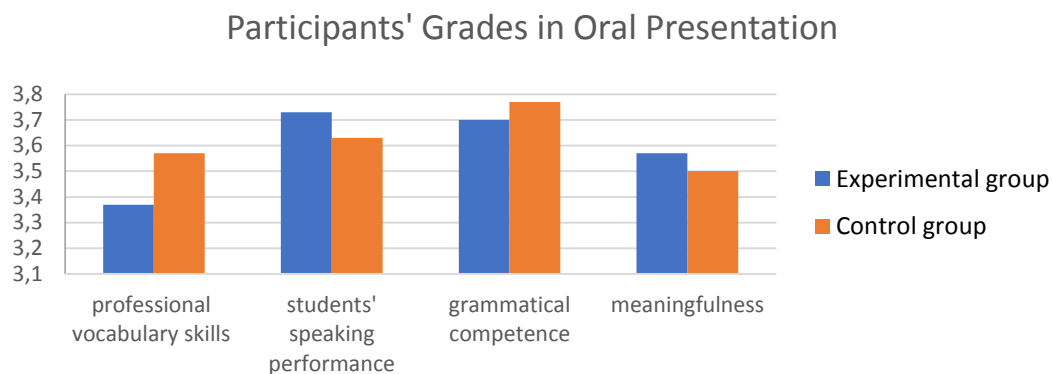
Students' grades are presented in Figure 1.

Participants' Grades in Oral Presentation

Fig. 1. Results of diagnostic test

Thus, students received lowest marks in two criteria: professional vocabulary skills (control group – $\bar{X}$ = 3,57, experimental group – $\bar{X}$ = 3,37) and meaningfulness (control group – $\bar{X}$ = 3,5, experimental group - $\bar{X}$ = 3,57).

This fact was caused by a number of This fact was caused by a number of errors in the presented monologues, including: a limited or extremely narrow range of syntactic constructions and lexical units on the topic, weak or insufficient disclosure of the topic, lack of clarity of the message, lack of detail in its key points, illogical or fuzzy organization of sentences within the monologue, weak connection between them, disordered and incoherent presentation, limited use, lack or simplicity of means of communication used.

Control stage

During the control stage the effectiveness of web platforms' usage for the development of students' lexical skills was verified. Students passed an oral interview related to professional activities at the end of term. Figure 2 illustrates students' grades.

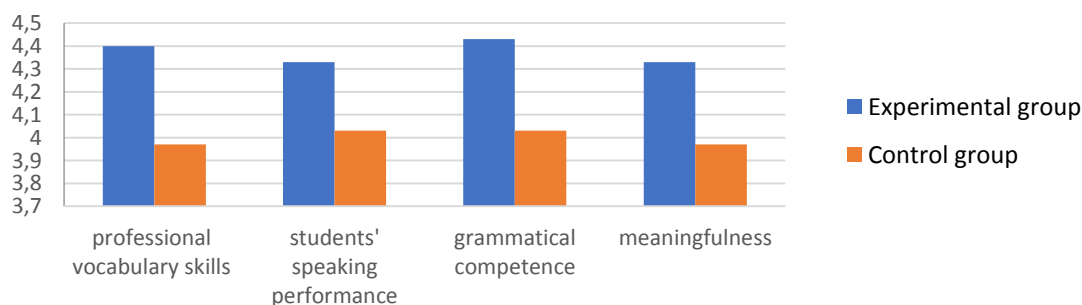## Participants' Grades in Oral Presentation

Fig. 2. Results of repeated testing

The findings revealed that students in the experimental group performed significantly better in terms of professional vocabulary skills, speaking performance, and grammatical accuracy, compared to the control group.

Computer programs SPSS 17.0 (IBM) and Microsoft Office Excel 2017 were employed for data processing and graphing.

Indicators of asymmetry and kurtosis, which characterize the shape of a distribution's curve, were utilized to determine the type of feature distribution.

The values are presented as M±SD, where M represents the sample mean, and SD represents the sample standard deviation.

A Student's T-test was conducted to compare the averages, as the distribution of the features conforms to the normal distribution, and the sample variances are equivalent.

The differences between the groups were considered statistically significant with a p-value less than 0.05. In each case, two-sided versions of the statistical tests were used.

Table 1. Statistical data based on the results of diagnostic and repeated testing

Statistical characteristics	Professional vocabulary skills			Student' speaking performance			Grammatical competence			Meaningfulness		
	Diagnostic testing	Repeated testing	Mean difference	Diagnostic testing	Repeated testing	Mean difference	Diagnostic testing	Repeated testing	Mean difference	Diagnostic testing	Repeated testing	Mean difference
Control group (n = 30)												
M	3,57	3,97	11 %	3,63	4,03	11 %	3,77	4,03	7 %	3,50	3,97	13 %
SD	0,63	0,67	7 %	0,61	0,67	9 %	0,63	0,61	-2 %	0,51	0,61	21 %
Tpk	**2,38**			**2,42**			**2,30**			**3,24**		
P1-2	**<0,001**			**0,001**			**0,009**			**<0,001**		
F	**1,13**			**1,21**			**1,07**			**1,43**		
Pf1-2	0,725			0,655			0,924			0,312		
Experimental group (n=30)												
M	3,37	4,40	31 %	3,73	4,33	16 %	3,70	4,43	20 %	3,57	4,33	21 %

SD	0,61	0,62	1 %	0,78	0,71	-9 %	0,60	0,68	14 %	0,57	0,66	16 %
Tpk	6,49			3,12			4,41			4,77		
P1-2	**<0,001**			**<0,001**			**<0,001**			**<0,001**		
F	**1,03**			**1,21**			**1,28**			**1,34**		
Pf1-2	0,955			0,599			0,487			0,421		
Tpk	1,25	2,58	-	0,55	1,68	-	0,44	2,40	-	0,50	2,19	-
Pc-e	0,217	**0,012**	-	0,585	0,098	-	0,674	**0,020**	-	0,634	**0,030**	-

Note: P1-2 – statistical significance of the difference between the averages of the indicators prior to and after training; Pf1-2 – statistical significance of the variance difference i between indicators prior to and after training, as per the Fisher's criterion; Pc-e – statistical significance of the difference in averages between the control and experimental groups.

Statistical analysis of the data indicates that, prior to the training session, the average scores of the control group and the experimental group did not significantly differ in any of the following four aspects: Pc-e > 0.05.

However, after retesting, there was a significant difference (P1-2 < 0.05) in the average values on all four scales, both for the control group and the experimental group.

During the repeated testing phase, the mean score for the "Professional Vocabulary Skills" test in the experimental group increased significantly (Pc-e = 0.012).This increase was approximately 1.11 times higher than in the control group.

The average value for "Student' speaking performance" showed a statistically significant improvement in the experimental group compared to the control group, with an increase of 1.07 (Pc-e = 0.098). Likewise, the average score for "Grammatical competence" in the experimental group showed a significant improvement (Pc-e = 0.020), with an increase of approximately 1.1 times compared to the control group.

Online platforms offer a number of advantages. Firstly, the Internet platform contains authentic video materials, which, not only significantly facilitates teacher's work (Wang, 2009; Jevsikova et al., 2021) but also increases students' independence (Lacka, Wong, 2021). Secondly, teaching foreign language professionally oriented vocabulary with the help of ICT helps searching for fresh and relevant resources (Mkrttchian et al., 2021; Davis, 2020). The findings of the survey align with those of the research conducted by J. Hsu. (2007), L. Lockyer and J. Patterson (2008).

Additionally, a significant role is played by the appropriate selection of internet resources, as the quality of a given resource, in turn, has one of the most significant impacts on the effectiveness of vocabulary instruction. If the resource is outdated or of poor quality, the motivation of the student disappears, and the effectiveness of training will deteriorate.

It should be noted that our research has some limitations. The experiment was conducted at Saint Petersburg Mining University and included 60 second-year architecture students. Convenience sampling was employed; students aged between 17 and 22 years with a level of language proficiency of A2 to B1 were divided into two groups: the experimental group and the control group. We didn't take into account the gender and the age of participants. In future scientific works the authors plan to examine more participants from different majors.

4. Conclusion

The study of using online platforms was performed at the Department of Foreign Languages of Saint Petersburg Mining University from September 2022 to December 2022. The results of the experiment conducted at the Mining University confirm the effectiveness of using web platforms for the development of architecture students' lexical skills, improving their professional knowledge and abilities. Passing an oral interview, the students of experimental group showed better results in such indicators as professional vocabulary skills, students' speaking performance, grammatical competence and meaningfulness. The average value for these indicators in the experimental group was statistically 1.10 times more than in the control group.

The results prove that the use of online platforms when teaching professionally oriented vocabulary has a positive impact on learning in general and helps solve a number of problems that

arise when teaching such vocabulary to students of non-linguistic specialties. Online platforms provide all possible ways of transcoding vocabulary, regular repetition of lexical material, which can favorably affect the effectiveness of vocabulary learning.

Thus, online resources and web platforms are an excellent modern means for the development of communicative competence.

5. Author contributions

Conceptualization, A.Yu.M. and Yu.V.B.; Data curation, O.S.Zh., A.Yu.M. and Yu.V.B; Formal analysis, O.S.Zh.; Funding acquisition, A.Yu.M. and Yu.V.B.; Investigation, O.S.Zh., A.Yu.M. and Yu.V.B.; Methodology, Yu.V.B.; Project administration, A.Yu.M. and Yu.V.B.; Resources, A.Yu.M. and Yu.V.B.; Software, O.S.Zh.; Supervision, Yu.V.B. and A.Yu.M.; Validation, A.Yu.M. and Yu.V.B.; Visualization, O.S.Zh.; Writing—original draft, Yu.V.B. and A.Yu.M.; Writing—review and editing, O.S.Zh.A., A.Yu.M. and Yu.V.B. All authors have read and agreed to the published version of the manuscript.

6. Conflict of interest

We have no conflict of interest to disclose.

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